Walla Walla River Fish Passage Operations Program

Annual Report
2000 - 2001

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Fish Passage Operations in the Walla Walla River, 2000-2001

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

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ABSTRACT

In the late 1990's, the Confederated Tribes of the Umatilla Indian Reservation, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife, along with many other agencies, began implementing fisheries restoration activities in the Walla Walla Basin. An integral part of these efforts is to alleviate the inadequate migration conditions in the basin. The migration concerns are being addressed by removing diversion structures, constructing fish passage facilities, implementing minimum instream flow measures, and initiating trap and haul efforts .

The objective of the Walla Walla River Fish Passage Operations Project is to increase the survival of migrating adult and juvenile salmonids in the basin. The project is responsible for coordinating operation and maintenance of ladders, screen sites, bypasses, trap facilities, and transportation equipment. In addition, the project provides technical input on passage criteria and passage and trapping facility design and operation. Operation of the various passage facilities and passage criteria guidelines are outlined in an annual operations plan that the project develops.

During the 2000-2001 project year, there were 624 summer steelhead (*Oncorhynchus mykiss*), 24 bull trout (*Salvelinus confluentus*), and 47 spring chinook (*O. tshawytscha*) counted at the Nursery Bridge Dam adult trap between December 27, 2000 and June 7, 2001. The Little Walla Walla River juvenile trap was not operated this year. The project transported 1600 adult spring chinook from Ringold Springs Hatchery to the South Fork Walla Walla Brood Holding Facility and outplanted 1156 for natural spawning in the basin. The project also provided equipment for transportation of juveniles captured during the construction fish salvage at Nursery Bridge Dam.

INTRODUCTION

The Confederated Tribes of the Umatilla Indian Reservation (CTUIR), Oregon Department of Fish and Wildlife (ODFW), and Washington Department of Fish and Wildlife (WDFW) are conducting numerous fisheries activities associated with the rehabilitation of summer steelhead and bull trout populations in the Walla Walla River Basin (Figure 1) (CTUIR, et al. 2001). In addition, reintroduction efforts are also in progress for spring chinook in the basin (COE 1997, CTUIR 1998, CTUIR, et al. 2001). The Bonneville Power Administration (BPA) and U.S. Army Corps of Engineers (COE), along with other local, state, and federal agencies, are funding several projects related to the restoration of these populations (CTUIR, et al. 2001). Included among these is the Walla Walla River Fish Passage Operations project.

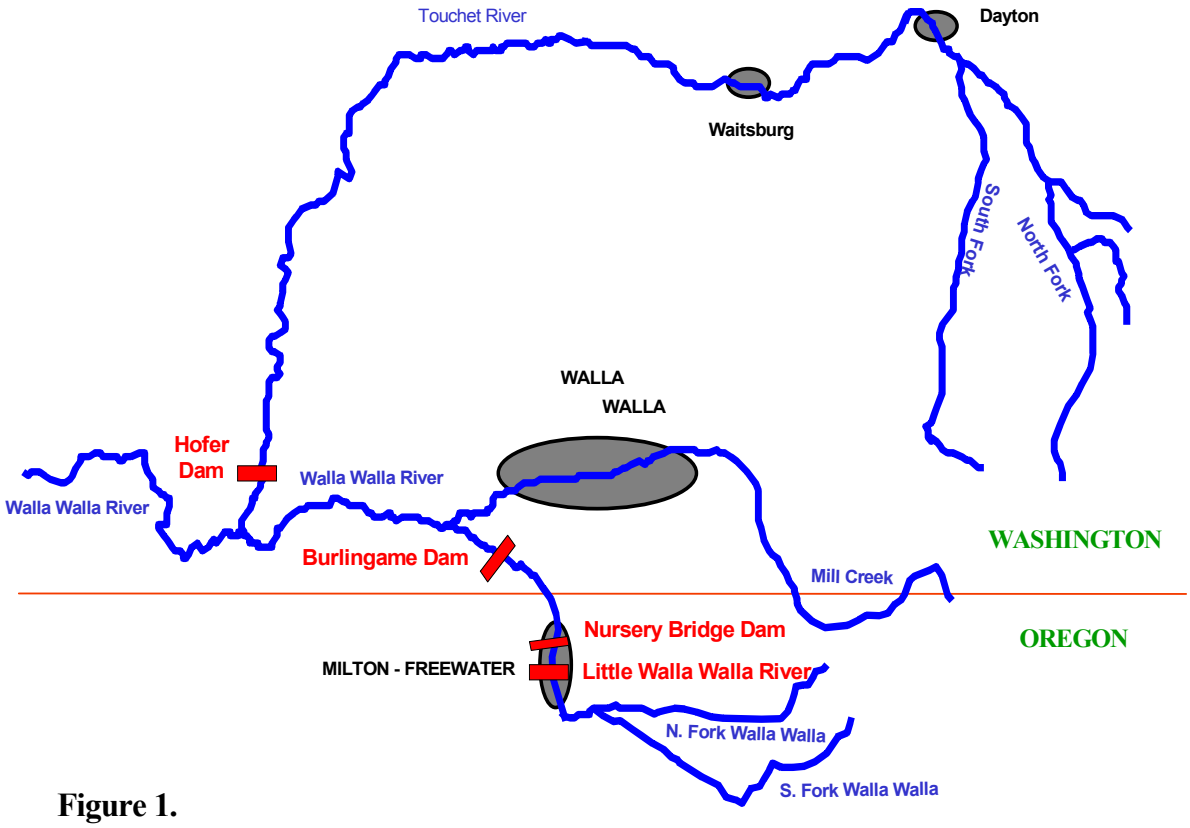

Figure 1.

The Walla Walla River is heavily diverted for agricultural use. Passage constraints associated with these diversions are one of the major factors limiting fisheries restoration efforts in the basin (CTUIR & ODFW 1990, COE 1997, CTUIR, et al. 2001). Low flows and diversion structures can delay or preclude the migration of both adult and juvenile

salmonids. Fish passage improvement efforts, including maintenance of instream flows, dam removal, ditch consolidation, juvenile screens and bypasses, adult ladders, and trap and haul capabilities are being implemented to enhance passage conditions.

The Walla Walla River Fish Passage Operations project was implemented in 1998 to assist fish passage in the basin. The objective of the program is to maximize survival of migrating adult and juvenile salmonids in the Walla Walla River. The project has four primary areas of responsibility to meet this objective: 1) Monitor flow and passage conditions; 2) Operate passage facilities, trapping facilities, and transportation equipment; 3) Provide technical input on passage improvement projects; and 4) Coordinate passage improvement efforts.

METHODS

Task 1 - Passage Conditions Monitoring

SubTask 1.1 - Monitoring of River Conditions

Temperatures are monitored during the project year to help identify temperature related passage constraints and to refine operating guidelines. Temperature data is accessed as needed for various locations in the basin through the local irrigation districts monthly river monitoring reports and other agency temperature monitoring efforts.

Daily river flow is monitored for the South Fork Walla Walla River and North Fork Walla Walla River in Oregon. Daily irrigation usage is monitored for Little Walla Walla River in Oregon. Flow and diversion data for these sites is provided by the Oregon Department of Water Resources (OWRD). In addition, the local irrigation districts monitor river flow in the reach from Nursery Bridge Dam to the state line. This data is available from their monthly river monitoring reports.

Flows are also monitored at two mainstem locations in Washington. Flow data is recorded at a United States Geological Survey (USGS) gauging station located on the lower mainstem Walla Walla River (RM 18), below the confluence with the Touchet River. Seasonal flow data is also recorded at a portable gauging station located in the upper mainstem Walla Walla River just below Burlingame Dam. This data is also available through the local irrigation districts monthly river monitoring reports.

SubTask 1.2 - Inspection of Passage Facilities

Juvenile fish screens/bypasses and adult ladder facilities, located at three major diversions and several smaller diversions, 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 - Passage Facilities Design Review

A number of juvenile and adult passage improvement projects are being implemented, or planned for, in the Walla Walla Basin. Development of these passage projects has been tasked to various engineering consulting firms by the funding agencies. The project provides technical input on both design and operating criteria for these passage facilities based on operating expertise developed with similar type projects in the Umatilla and Walla Walla basins.

SubTask 1.4 - Annual Operations Plan Development

Many different passage improvement projects have been implemented as part of the fisheries restoration efforts in the Walla Walla Basin. These include juvenile screens, bypasses, and traps and adult ladders and traps. In addition, minimum instream flows for summer steelhead and bull trout have been required by National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act (ESA).

It is essential that operation of facilities be coordinated with river conditions and diversion activities to maximize survival for migrating adults and juveniles as well as resident salmonids. One vehicle for coordinating these passage efforts is through an annual operations plan (AOP) which is developed by the project. This plan receives input from state, federal, and tribal fisheries biologists, irrigation district personnel, and other entities involved with daily operation and maintenance activities, water issues, and fisheries management decisions in the basin.

Task 2 - Adult and Juvenile Trapping Facilities Operation

SubTask 2.1 - Little Walla Walla Juvenile Trapping

A juvenile bypass and trapping facility is located at the Little Walla Walla River diversion. The facility consists of vertical plate screens along with a fish bypass and trap (Figure 2). It is designed to bypass outmigrating juveniles during periods of adequate flow or trap them during periods of low flow.

Figure 2.

The 2000/2001 AOP outlined the following criteria for operating the Little Walla Walla River diversion bypass and trap. The criteria specifies that if flows are continuous from Nursery Bridge Dam through to the state line until June 15, then the juvenile bypass is to remain open. If flows in this reach become intermittent prior to June 15, the juvenile bypass will be closed and the trap opened. At the point during trapping where resident salmonids outnumber migratory juveniles, the trap will be shut off and the bypass reopened.

Information to be collected at the Little Walla Walla River facility includes dates of canal operation and facility operational modes. Data related to trapping and hauling of juveniles and adults from the facility will also be collected.

SubTask 2.2 - Nursery Bridge Adult Trapping

An adult trap is installed into the existing "steeppass" type ladder located on the west bank at Nursery Bridge Dam. Vertical bar grates are placed at both the upstream and downstream ends of the turn in the ladder. In addition, a finger weir is located at the downstream end that the fish pass over to enter the trap.

According to the 2000/2001 AOP, the existing Nursery Bridge ladder was to remain open through the summer until the new fish ladder was completed. No trapping was to be conducted at either ladder this year. Enumeration of adult returns was to occur through video counting in the new ladder beginning in November and continuing through June.

Data to be collected from the video counting includes number, species, and marks. In addition, the number of summer steelhead kelts, jack and adult spring chinook, and size range and migration direction for bull trout were to be recorded. Notations are also to be made of other species encountered and general fish condition.

SubTask 2.3 - Adult and Juvenile Transportation

The Walla Walla Fish Passage Operations project has one 3,000 gallon, one 750 gallon, and two 370 gallon fish liberation units available for use. 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. It is equipped with both liquid oxygen and electric aeration to reduce fish stress during transport. The 750 gallon unit is mounted on a flatbed truck and consists of a single compartment with a 12 inch discharge opening. It has both compressed oxygen and electric aeration. The two 370 gallon transport tanks are mounted on dual axle trailers and are pulled by pick-up trucks. Each is equipped with both compressed oxygen aeration and a re-circulation system. Both units have an eight inch discharge opening. These transportation units are used in both the Umatilla and Walla Walla basins.

Transportation requirements are based on general observations of juvenile and adult migration in the Walla Walla River. Criteria for transporting fish captured at basin

trapping facilities are outlined in the AOP. The AOP also outlines release locations for any adults or juveniles hauled. Transportation data collected will include date, transport unit, number of pounds or fish hauled, species composition, and an estimate of mortality. ODFW liberation protocols are used as the basic guideline for hauling operations.

SubTask 2.4 - Trapping Facilities Design Review

Only one trapping facility is currently under development in the Walla Walla Basin. The project is providing technical input on both design and operating criteria for this facility based on operating expertise developed with similar type projects in the Umatilla Basin.

RESULTS

Task 1 - Passage Conditions Monitoring

SubTask 1.1 - Monitoring of River Conditions

Water temperatures exhibited extreme seasonal fluctuation during the year. Temperatures are measured seasonally and generally only during the lower flow months (May through the fall). In the reach from Nursery Bridge Dam to the state line, water temperatures ranged from a low of around 40^{o} F in November 2000 to a high of 77^{o} F in May 2001. Below Burlingame Dam, temperatures ranged from 34^{o} F in December 2000 to 74^{o} F in July 2001.

Flows measured for the South Fork Walla Walla River ranged from 106 to 515 cfs and flows in the North Fork Walla Walla River ranged from 7 to 332 cfs. No data was available from these two sites after late July. Flows in the reach from Nursery Bridge Dam to the state line were field measured by the local irrigation districts from September to early December and again from late May through August. Minimum flow during these periods was 0 cfs measured in September 2000. With the increased instream flow requirement of 18 cfs below Nursery Bridge Dam for 2001, there was continuous flow through this stream reach this year. The lowest flow recorded was 3 cfs measured in May. Flows in this reach were not measured during the high flow months.

Flows were measured in the mainstem Walla Walla River below Burlingame Dam by a seasonal recorder. The recorder was in place through mid November 2000 and from late May through the summer. Flows measured during these periods ranged from 10 cfs to over 200 cfs, both in October 2000. Flows in this reach were also not measured during the high flow months. Flows measured at the USGS site in the lower Walla Walla River ranged from a low of 16 cfs in August 2001 to a high of 1,940 cfs in February 2001. Flows and temperatures reported for all sites are from field data and have not been finalized.

SubTask 1.2 - Inspection of Passage Facilities

A number of operational problems were observed during monitoring of the juvenile and adult passage facilities. These include incorrect forebay elevations, gaps in screen seals, inadequate bypass conditions, problematic canal wasteway operations, and the stranding of juveniles in canals.

Both the Burlingame Canal and Little Walla Walla River juvenile screening facilities were evaluated by Battelle PNNL to determine how these new facilities were operating in relation to design criteria. Generally, both sites were operating as designed. Individual approach velocities higher than criteria levels were observed at Burlingame Canal, however the average velocity was within criteria. Two other minor concerns were observed; 1) debris buildup around concrete civil structures at Burlingame Canal and 2) algae buildup on the lower 6-8 inches of the screen surface at Little Walla Walla River

(Geoff McMichael, Battelle PNNL, personal communication).

SubTask 1.3 - Passage Facilities Design Review

The project provided technical input on two major passage projects that were under construction during the 2000/2001 project year. A new juvenile screen system was installed at the City of Walla Walla water supply intake on upper Mill Creek in August 2001 and the new ladder at Nursery Bridge Dam was opened on July 25, 2001. The project also provided extensive technical comments on the O&M manual developed for the Little Walla Walla River screen/trap facility. In addition, designs were reviewed for a new screening system associated with consolidation of the Lowden #2 and Garden City diversions and for juvenile screens and adult passage options at Hofer Dam.

SubTask 1.4 - Annual Operations Plan Development

The project produced a Walla Walla AOP for the 2000/2001 year in June 2000 in conjunction with the ESA Civil Penalty Settlement Agreement (Settlement Agreement)(June 9, 2000) between USFWS and the local irrigation districts. Significant requirements which affected passage operations were conditions of that agreement and were incorporated into that AOP which covered the time period from July 1, 2000 to September 30, 2001. It was attached as Appendix B in the 1999/2000 Walla Walla Fish Passage Operations Annual Report (Zimmerman and Duke, 2000).

A new AOP covering the period from October 1, 2001 through September 30, 2002 was drafted in August. Passage requirements included in the Final Amended Civil Penalty Settlement Agreement (Amended Settlement Agreement)(June 27, 2001) between USFWS and the local irrigation districts are included in the 2001/2002 AOP. This document is attached as Appendix B.

Task 2 - Adult and Juvenile Trapping Facilities Operation

SubTask 2.1 - Little Walla Walla Juvenile Trapping

The juvenile trap at Little Walla Walla River was not operated again this year due to increased instream flows below Nursery Bridge Dam and related operational criteria outlined in the 2000/2001 AOP.

SubTask 2.2 - Nursery Bridge Dam Adult Trapping

The existing Nursery Bridge Dam ladder was open the entire project year until July 25, 2001 when the river channel was diverted to the new ladder. The adult trap was installed in the ladder on October 19, 2000 and remained in operation until June 7, 2001 when it was removed. The new ladder at Nursery Bridge Dam was not operational until July 2001 due to construction delays. No enumeration occurred at the new facility during

the 2000/2001 project year.

A total of 624 summer steelhead were trapped from December 27, 2000 to June 5, 2001. Of these, 595 were unmarked and 29 were of hatchery origin. There were two hatchery adults sacrificed and the rest were released. In addition, there was one day when the trap was broken into and an unknown number of fish were removed from the trap. Peak return month was March when 47.3% (295 of 624 fish) of the adults were trapped.

There were also 24 bull trout and 47 spring chinook adults captured at the Nursery Bridge Dam trap. Bull trout were trapped from May 9 to June 6, 2001 and spring chinook were trapped from May 4 to June 7, 2001. Peak trapping month for both bull trout and spring chinook was May. In addition, resident rainbow trout and suckers (*Catostomus spp.*) were captured in the trap. Appendix A contains a daily trapping record of fish captured at Nursery Bridge Dam during 2000/2001.

SubTask 2.3 - Adult and Juvenile Transportation

No juveniles or adults were transported from any of the basin trapping facilities this year. The project did provide personnel and/or equipment for two other transportation efforts this year.

In order for instream construction activities to be completed at Nursery Bridge Dam, the river channel had to be relocated to the east bank. Salvage of juvenile and adult fish from this dewatered stream reach occurred on July 25 and 26, 2001. The project provided equipment to transport fish recovered during the salvage efforts. Information on numbers of fish hauled, mortality, and species composition was collected and a detailed summary is available from the ODFW Pendleton District Office.

Outplanting of spring chinook adults for natural spawning augmentation in the Walla Walla Basin occurred again this year. This program required transportation of adults from Ringold Springs Hatchery to the South Fork Walla Walla Spring Chinook Brood Holding and Spawning Facility and, later, from the South Fork facility to outplanting locations in natural production areas.

The project, in cooperation with ODFW, transported 1600 spring chinook adults from Ringold Springs to the South Fork facility between May 21 and June 5, 2001. The project hauled all but 200 of these fish. A total of 20 trips were made on seven days. Eight trips were made with the 3,000 gallon tanker, ten with the 750 gallon unit, and two by ODFW with a 1,200 tanker. Only two transport mortalities were observed upon unloading at the South Fork facility.

The surviving adults were transported from the South Fork facility to natural spawning areas from August 6 through 8. A total of 1,156 spring chinook were transported in eight loads from the facility using the 3,000 gallon tanker. There were 150 adults ouplanted at one location in Mill Creek (RM 23) and 1,006 adults outplanted at one location

in the South Fork Walla Walla River (RM 9). No transport mortalities were observed.

SubTask 2.4 - Trapping Facilities Design Review

The only trapping facility under development during the project year was the adult trap incorporated into the new Nursery Bridge Dam ladder. The project provided both design and operational input for the collection and handling facilities.

DISCUSSION

Task 1 - Passage Conditions Monitoring

SubTask 1.1 - Monitoring of River Conditions

As part of the two Settlement Agreements, USFWS has required comprehensive flow and temperature monitoring be conducted by the local irrigation districts below Nursery Bridge and Burlingame dams. As discussed in earlier annual reports, these two locations are the most important sites for hydrological data from a passage perspective as they are located downstream of major diversions at what are normally the lowest flow points in the river. Data from these two locations is a key component in decisions of whether to trap or bypass smolts and adults, how to operate fish passage facilities, and at what flows adults and juveniles can effectively migrate.

Temperature and flow data from other, less critical, passage locations in the Walla Walla Basin are being monitored and reported by other agencies. The project continues to make field observations of flow and temperature but no longer collects or reports detailed flow and temperature field data from the Walla Walla Basin as this is redundant with other ongoing efforts in this area. The project accesses data collected and reported by the irrigation districts and other sources for hydrological information relative to passage operations on an as needed basis.

The Amended Settlement Agreement increased the instream flow requirements for the summer of 2001 over those from last year. Minimum flow levels were increased from 13 cfs to 18 cfs below Nursery Bridge Dam and from 10 cfs to 14 cfs dowstream of Burlingame Dam. This summer there was continuous flow from Nursery Bridge Dam all the way through to the state line. These minimum instream flows extend opportunity for passage, although, it is too early to tell how large an effect these lower flows have on adult and juvenile migration. Instream flow maintenance has increased the area available for rearing of resident and non-migratory salmonid life histories. Historically, few fish would be in this river reach by mid summer. However, fairly large numbers of juveniles and a few adult spring chinook were captured from a small portion of this stretch during the late July salvage operation.

SubTask 1.2 - Inspection of Passage Facilities

The only parameter to be observed out of criteria during the evaluation of Burlingame Canal juvenile screens by Battelle PNNL was approach velocity. Approximately 10% of the approach velocity measurements were rates greater than 0.4 ft/s (Geoff McMichael, Battelle PNNL, personal communication). Battelle PNNL suggested that the blank screen panel should be replaced with an operating screen to reduce the occurrence of these high approach velocities.

The forebay elevation at Little Walla Walla River varied widely during the project year, especially during the fall as diversions were being decreased. This can adversely

affect passage conditions at the facility in two ways. First, low water surface elevations decrease the amount of wetted screen surface. This may increase velocities at the screen face above criteria levels. Secondly, the lower water surface can reduce flow to the bypass. The operating criteria for the facility identify a specific water surface elevation for the forebay to be maintained at. Operating criteria for the rest of the facility were developed under the assumption that the forebay elevation would be maintained at the specified level. When the canal was being operated at these lower water surface elevations, the bypass ramp was not always being adjusted accordingly. This would cause flows to the bypass to be reduced. This was due, in large part, to the delay in receiving operational manuals for the facility. As the irrigation districts gain more experience and familiarity with this new facility the variations in water surface elevation should decrease.

There were also problems maintaining inflation of the rubber dam at Little Walla Walla River. On further inspection it was found that a beaver had chewed holes in parts of the dam requiring the compressor to run on a continual basis to maintain inflation. Then in August, the dam was vandalized and had holes cut in it. Inflation could be maintained only by lowering the Obermayer gate to relieve some of the pressure on the dam. This resulted in some additional water remaining instream past the diversion.

During the winter, the juvenile screen facility at Little Walla Walla River was dewatered and the seals were re-inspected. One fairly large gap was observed and repaired. In addition, large gaps in the seals were observed at the Milton Ditch screen when it was dewatered. This screen was repaired for the 2001 season by ODFW Mitchell Act personnel. The Milton Ditch screen has been identified in the Amended Settlement Agreement for replacement before 2002 or the ditch cannot be used. This ditch has been identified for consolidation into the Little Walla Walla River. The abandonment of this ditch would be highly beneficial as the screen condition is just one of a myriad of fisheries related problems associated with this site.

Bypass conditions at three sites were less than optimal for portions of the year. As discussed above, at Little Walla Walla River there were periods where the canal surface elevation was lower than the criteria. This resulted in low flows through the bypass system. Attempts were made to adjust the bypass ramp according to the surface elevation but unless the canal is operated at the specified height the optimal bypass flow cannot be maintained. At Eastside Ditch, as river flows decreased the bypass outfall became progressively isolated from the main channel. The bypass was finally closed and fish had to use the wasteway channel for downstream passage. At Milton Ditch, bypass conditions have always been questionable.

Use and operation of the canal wasteways at Little Walla Walla River and Milton Ditch need to be reexamined. At Little Walla Walla River, the wasteway was used to drain the canal which provided an unscreened passageway for fish to access the area behind the screens. Either the wasteway needs to be screened or another method of dewatering the canal should be used. At Milton Ditch, the irrigation district uses an unscreened wasteway to regulate flow in the ditch at their headgate. Again, this allows fish to access an

area located downstream of the screens. This is a much bigger concern at Milton Ditch than at Little Walla Walla River for two reasons. One, since the wasteway is used to regulate flow, the potential exists that this access avenue is open for the entire irrigation season, whereas at Little Walla Walla River the wasteway is only open for a few days while the canal is being lowered. Second, any fish that are trapped behind the screens at Little Walla Walla River have an opportunity to access an area in the system where there is year round flow and can survive. At Milton Ditch, when the ditch is dewatered any fish remaining are dried up and die.

The biggest operational difficulty encountered this year was the stranding and loss of salmonids at the Eastside and Milton ditches when they were dewatered at the end of the irrigation season. In both cases, the irrigation district pushes up a gravel berm in the mouth of the ditch to shut off flow and provide high water protection. There were reports by ODFW screen personnel of a significant number of salmonids stranded in Eastside Ditch when is was dewatered in October 2000. However, by the time the project personnel inspected the ditch it was completely dry and few signs of fish were present. Project personnel coincidentally inspected Milton Ditch the day it was shut off. Approximately 500 live *O. mykiss* were recovered from the ditch both above and below the fish screen along with a number of mortalities. The large number of fish below the screens could have been due to the poor screen seals, access through the wasteway, or a combination of the two. Also, there were mortalities recovered from the area where the heavy equipment had pushed up the berm.

Headgates at the point of diversion for these two ditches would eliminate the need to put heavy equipment in the river on a biannual basis and would allow the ditches to be slowly lowered to allow fish to leave volitionally or be salvaged. In addition, the irrigation district needs to better coordinate ditch shut downs with the fish management entities so that equipment and personnel can be available in case fish need to be rescued instead of just letting them die.

Inadequate juvenile screens still exist at many diversions in the basin. Most are old, in very poor condition, and no longer meet current screening standards. A new screen facility is planned for construction next year at the Garden City/Lowden #2 diversions. In addition, the consolidation of Milton Ditch into the Little Walla Walla diversion and the Garden City and Lowden #2 diversions will eliminate two surface diversions from the river. Juvenile screen upgrades have been identified for Eastside/Westside Ditch (Hofer Dam - Lower Touchet River) and two other lower mainstem diversions in Washington. However, these projects are still a couple years away from completion and many other small diversions have yet to be scheduled for screening improvements.

The inability to operate screen sites within NMFS passage criteria is in most cases related to the vintage and general condition of the screens in the basin. As stated above, most of the Washington mainstem diversions have been identified for future screen replacement but in the interim will continue to operate with inadequate screens. Most of the smaller diversions located in the Washington tributaries of the basin also have inadequate

screening. Poor or non-existent juvenile bypasses exist at many of the sites as well. Because many of these screen sites are in marginal physical condition and do not meet current screen criteria, it is imperative that reliable O&M occur at the sites.

In addition to screening and bypass problems in many of the Washington tributaries, there are also major adult passage concerns in Mill Creek. The U.S. Army Corps of Engineers flood control project and irrigation diversions have combined to create multiple passage impediments in Mill Creek. Most specifically, there appear to be potential passage impediments at Gose St. bridge, in lower Mill Creek due to flow reduction for diversion down Yellowhawk Creek, at the Bennington Dam ladder, and at the Bennington Lake diversion. It is not known to what extent passage is delayed or precluded at these various sites. An adult passage evaluation project is scheduled to be implemented in the Walla Walla Basin which will hopefully answer some of these Mill Creek passage questions.

As discussed last year, the Burlingame ladder cannot be operated at low flow levels and still maintain the proper canal level for screen submergence without some type of low flow sills or panels. Temporary plywood panels were used last year and they were replaced this winter with more permanent metal plugs. These plugs still have to be put in and removed twice a year but are the solution to the problem at this point and no other alternatives are being examined.

There have been major delays in establishing O&M contracts for the various BPA passage facilities in the basin. The contracts for Little Walla Walla River and Burlingame have just been implemented even though these facilities have been in operation for almost two years. This problem becomes more acute as additional facilities are constructed. While O&M is occurring at Little Walla Walla River and Burlingame Canal, there is no O&M responsibility for the new Nursery Bridge Dam ladder which is already operating. Without O&M contracts to maintain these sites, adequate daily maintenance will be a concern. It is important that BPA have O&M contracts in place to provide the necessary daily and annual maintenance needs before the facilities are completed.

The O&M at the smaller screen sites in Oregon is conducted by ODFW Mitchell Act screens personnel and is generally adequate for normal operating periods. However, during abnormal stream conditions such as high flows or moss buildup, the level of maintenance may not be sufficient. The O&M at many of the smaller screen sites in the Washington portion of the basin is conducted by the ditch operators and is questionable as to the adequacy of the effort. It is again recommended that the possibility of WDFW taking over O&M responsibility for these sites be investigated.

SubTask 1.3 - Passage Facilities Design Review

Continued progress towards completion of passage projects in the basin is a major step forward in correcting the inadequate passage conditions that exist. However, there are still a large number of sites with adult and juvenile passage concerns. Most of the major passage problems in the mainstem have been identified for improvement but the time

schedules for planning and implementation of many of these projects continue to be delayed for various reasons. This in turn results in higher than projected costs which leads to further implementation delays or cutting of projects. There are still many passage concerns in the tributary areas, especially Mill Creek, which need to be addressed. The project continues to provide design and operational input on these projects as well as identify other juvenile and adult passage concerns for improvement.

SubTask 1.4 - Annual Operations Plan Development

Development of the AOP continues to evolve each year. The 2001/2002 AOP will only cover passage issues and will not include artificial production activities as in the past. It has been modified to include operational changes made during the course of this year's operations and incorporate any additional changes outlined in the Amended Settlement Agreement. It was drafted in August 2001 and will be in effect from October 1, 2001 to September 30, 2002. As new facilities come on line, and additional information becomes available, they will be incorporated into future AOPs.

Task 2 - Adult and Juvenile Trapping Facilities Operation

SubTask 2.1 - Little Walla Walla Juvenile Trapping

The project did not conduct any trapping operations this year at Little Walla Walla River. As outlined in the 2000/2001 AOP, the juvenile bypass was to be left open as long as flows from Nursery Bridge Dam to the state line remained continuous through June 15. With the increased minimum flow requirement below Nursery Bridge Dam, flow was continuous through this reach all year. Next year, the minimum flow requirement will go up again to 25 cfs. It is anticipated that at these levels there will always be flow between Nursery Bridge Dam and the state line, eliminating the need to ever trap at Little Walla Walla River. The only trapping envisioned at the facility in the future may be for monitoring and evaluation reasons.

SubTask 2.2 - Nursery Bridge Adult Trapping

According to the 2000/2001 AOP, the existing Nursery Bridge ladder was to remain open through the summer and fall of 2000 to provide a passageway while construction continued on the new Nursery Bridge Dam ladder. Instream flows were routed through the existing west bank ladder to minimize impacts to construction activities for the new ladder. The existing ladder was to remain open until the new fish ladder was completed. However, major construction delays resulted in the new ladder not being operational until July 25, 2001. This resulted in the existing ladder being operated the entire year until the new ladder was operational.

It was anticipated in the 2000/2001 AOP that the new ladder would be operational by November 2000 and that no trapping would need to be conducted at either ladder this

year. All enumeration of adult returns was to occur through video counting in the new ladder. Due to the construction delays for the new ladder this was not possible and trapping was conducted in the old ladder to enumerate adult returns. Now that the new ladder is finally completed, it is anticipated that enumeration in 2001/2002 will be by video counting and no trapping will occur.

The minimum flow requirement of 13 cfs below Nursery Bridge Dam outlined in the Settlement Agreement allowed the existing Nursery Bridge Dam ladder to operate the entire season. Flows became continuous from Nursery Bridge to the state line at a minimal level in mid September. Flow levels in this reach increased in mid October and the trap was installed on October 19, 2000 but the first adult was not captured until December 27. This was similar to 1999/2000 when the first steelhead was captured December 20.

In the past, intermittent flows in the reach from Nursery Bridge Dam to the state line and passage problems at Burlingame Dam were thought to preclude adults from reaching Nursery Bridge until late fall or early winter. However, the Settlement Agreement identified minimum flow levels of 10 cfs below Burlingame Dam and the Burlingame ladder remained open all year. Also, flows were continual in the Nursery Bridge to state line reach throughout the fall and flow levels of 100 cfs or higher were observed by mid November from Nursery Bridge to below Burlingame Dam. Since Nursery Bridge Dam is located high in the watershed, the late arrival of summer steelhead to the trap is likely not as related to passage constraints as it is to natural migration timing into the upper watershed.

There was a break in at the Nursery Bridge trap sometime between when the trap was monitored on March 19 and March 21, 2001. When the trap was monitored on March 20, no fish were observed in the trap. There had been 30 summer steelhead enumerated on March 19 and 15 on March 21. Blood was observed on the inside of the trap but appeared to have been washed off the lid and walls. There were no signs of forced entry into the trap so it was assumed that access was gained through the finger weir opening or by key. The Oregon State Police and National Marine Fisheries Service were informed and investigated the situation. Locks and keys for the ladder and trap were both changed. No further incidents occurred at the facility.

SubTask 2.3 - Adult and Juvenile Transportation

No adult or juvenile salmonids were transported from trapping facilities in the Walla Walla Basin during the project year. Criteria outlined in the 2000/2001 AOP called for no trapping and hauling to occur from Little Walla Walla River if flows were sustained to the state line through June 15. As stated previously, flows were continuous through this reach the entire year and trapping was never initiated. The minimum instream flow level identified in the Amended Settlement Agreement is to be increased again in 2002 to 25 cfs below Nursery Bridge Dam. At these levels there should always be flow between Nursery Bridge Dam and the state line, eliminating the need for trapping or hauling from the Little Walla Walla River facility. The only trapping envisioned at the facility in the future may be for monitoring and evaluation purposes and would not require any transportation.

The transport of surplus spring chinook adults for natural spawning in the Walla Walla Basin was a big success. Over three times as many spring chinook were hauled this year compared to last year. There were only two mortalities noted on the transports from Ringold Springs Hatchery to the South Fork facility and none observed during outplanting from the South Fork facility. Fish condition at release appeared good. Results of spawning success will be reported by the CTUIR Natural Production Monitoring and Evalaution project in their annual report.

With all the adults being outplanted into one location in the South Fork there was some concern that adults might stack up, especially on the days where three or four loads were scheduled. It was thought that either another location may need to be used or that outplanting would have to be spaced out to give the fish a chance to distribute. However, adults were observed moving upstream immediately upon release. Even on August 7, when 607 fish were outplanted, no discernable buildup of adults was noticed.

Number of adults hauled per load was conservative and was probably a large factor in the low mortality rates. However, with the low water temperatures at the South Fork facility and speed of loading, load size could probably be comfortably increased to reduce the number of trips involved.

SubTask 2.4 - Trapping Facilities Design Review

There is both an adult trap and a video counting station incorporated into the new ladder at Nursery Bridge Dam. There are still a number of punch list items yet to be completed at the ladder even though it is operating. Many of these are related to the adult trapping and handling facility. There are numerous modifications needed and many of the items were not built as requested in the design meetings. However, this portion of the facility will probably not be operated for a few years until broodstock need to be trapped.

No additional trapping facilities are currently identified as needed in the basin. However, there have been discussions of the need for both adult and juvenile traps in the Touchet River if spring chinook restoration efforts are implemented in that subbasin and in Mill Creek to enumerate the summer steelhead population.

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Appendices

NO APPENDICES SUBMITTED