



FISH PASSAGE CENTER

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MEMORANDUM

TO: Salmon Managers
Fishway Inspectors
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Dave Hurson, COE Walla Walla District
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FROM: Larry Basham

DATE: September 17, 2001

RE: **Fishway Inspections – August 2001**

Overall, river flow remained significantly below normal for the month of August, with the drought conditions prevailing throughout the Columbia River basin. Spill was increased at Bonneville (24-h per day) and at The Dalles dams in early August. Mid-season dives to check diffuser gratings in the collection channel and entrances caused out of criteria conditions for about a day at affected projects. Also, The Dalles Dam had a forced outage of its fish turbines that reduced adult fish passage for about two days at the Oregon ladder. I completed and/or accompanied personnel for inspections of Bonneville, The Dalles, and John Day facilities during the month. On two days, the Tribal Salmon Corps inspectors accompanied me to observe fish passage facilities at these sites. In the upper Columbia River, milfoil and other grasses are floating down the river and have caused serious problems on the exit trashracks, pump intakes, and diffuser gratings. Doble testing was initiated at the Snake River dams this summer. Water temperatures increased the last week in August to about 70°F at most COE projects. Cooler air temperatures are needed to reduce the water temperatures and continue the safe passage for the adult fall chinook, steelhead, and coho migrating upstream in record or near record numbers.

Bonneville Dam –I completed an inspection of the adult and juvenile fish facilities at Bonneville Dam on August 22, a rainy day. River Q was 104.5 kcfs with 49.4 kcfs spill occurring. Three of eight main turbine units and both fish turbines were operating at the WA shore. No turbine units were operating at the old powerhouse. The turbidity of the water was 7.6-ft and the water temperature 69°F. As part of the FPP criteria, spillbays 1 and 18 were open .3 ft to provide attraction flows to the Cascades Island and B-Branch fishway entrances and the remaining spillbays following the recommended spill pattern.

Powerhouse I – The main entrances to the powerhouse collection channel were submerged 5.2 ft with 1.5 ft head and 6.4 ft with 1.3 ft head at respective Gates 2 and 64 using the PLC readings. The readable staff

gages on the north end of the powerhouse gave a channel to tailwater head differential reading of 1.4 ft. The velocity in the powerhouse collection channel was reported at 2.6 fps at the south end of the channel. The electronic meter at the north end of the channel was 1.25 fps, **slightly below the desired 1.5 fps**. The five sluice gates were open during the August inspection. The depth of water over the main Bradford fish ladder weirs was 1.0 ft, with 1.1 ft measured at the A-Branch and 1.0 ft at the B-Branch fish ladder. The exit from the ladder was building with grasses; however, **the picketed lead sections at the counting station had estimated head loss of 4-5 inches and required cleaning**.

B-Branch - The computer system was again not operating so visual readings were taken from the staff gages. Head differential was estimated at 1.7 ft during the inspection; the tailwater was assumed at 8.8 ft. Both downstream entrances were open with the north side entrance open as required. Entrance requirements were met during the August inspection at the B-Branch Fishway. **Note that an alternate diffuser was in service to replace the malfunctioning diffuser.**

Cascades Island - The Cascades Island fishway entrance is similar in design to the B-Branch. Both downstream entrances were operating with the head differential of 1.8 ft using the channel staff gage and assuming a tailwater elevation of 8.8 ft. The depth of water over the ladder weirs was 1.3 ft; **this reading was higher than recommended**. The computer system remained out of service, similar to the B-Branch Fishway. Entrance requirements were met during the August inspection at Cascades Island Fishway.

WA shore fishway –The new powerhouse adult collection system operates with two entrance gates located at each end of the powerhouse. Tailwater elevation permitting, the gates are operated 13 ft submerged below tailwater with the head differential between 1.0 and 2.0 ft. The South Entrance gates were submerged between 9.4 ft with head differential at 0.7 ft (upstream) and 1.0 ft (downstream). The north shore entrance gates were submerged 9.4 ft with the head differential ranging from 1.1 to 1.0 ft. Floating orifice gates along the channel were operating satisfactorily. The water velocity meter was out of service again during this inspection. The exit from the fish ladder was clear of debris, as were the serpentine pool sections located upstream from the fish counting station. The depth of water over the ladder weirs was 1.3 ft.

Overall, low tailwater elevations resulted in reduced gate depths at the OR and WA shore fishways. **The computer (PLC) system at the B-Branch and Cascades Island fish ladders should be fixed and operable as soon as possible; it has not been operational for most of this season.** Both downstream gates were open at the B-Branch and Cascades Island fishways and this should provide better passage conditions for adult fish. **The Project should calibrate the ph staff gages and computer readout (new ph); they differ.**

Juvenile System – Both juvenile bypass facilities were operating with all screens and orifices as required. The project was operating the low outfall based on tailwater elevation at the juvenile fish facility. **The orifice lenses were not clear enough in some cases to determine whether the orifice flow was smooth and the orifices not plugged with debris. Gatewells 11 and 12 should be cleared of debris.** The ice/trash sluiceway was operating at the old powerhouse.

The Dalles Dam – Doug Case, ODFW, and I completed an inspection of the fish facilities at The Dalles Dam on August 8. Project discharge was 134.5 kcfs with flow passing through eight operating turbines. About 40.5 kcfs spill was occurring during the inspection. Both fish turbines were operating at the Oregon fishway, with a single fish turbine operating at the Washington fishway. Water temperature was 69°F with a turbidity reading of 5.0 ft.

Washington Shore - Wasco PUD operates a single turbine unit that supplies water to the diffusion system and into the lower end of the fish ladder. Gate N-1 was submerged 8.9 ft below tailwater elevation with the head differential reading 1.4 ft using the Selsyns gage. The gate depth and head differential at Weir N-1

were operated within the proper criteria range. The PUD trash racks had 0.3 ft head differential. The depth of water reported over the fish ladder weirs was 1.3 ft.

Oregon fishway – About 4,340 cfs of water was directed to the auxiliary water supply system via the fish turbines. At the South Entrances, 1.3 ft of head was recorded with 8.7/8.9 ft depth using the Selsyns gage. The Selsyns gage at the East Entrances gave a high reading of 2.2 ft head differential and 8.6\10.9 ft gate depths for the inspection. At the West Entrances, the gate depths were about 9.3 ft with the head differential about 1.1 ft. These readings were satisfactory. The electronic velocity meter reported a water velocity of 3.3 fps through the collection channel.

The exit from the fish ladder was clear of debris at the exit trash rack. The East Ladder picket lead required cleaning; the project inspectors need to clean these pickets on a frequent basis with all the grasses presently floating in the river. The depth of water over the fish ladder weirs was 1.1 ft.

The normal sluice gates, Gates 1-1, 1-2, and 1-3, were operating as required to improve juvenile fish passage conditions at the project. The North shore juvenile fish facility was operating in sample mode and appeared to be operating at satisfactory levels.

Overall, the COE should repair and assure functionality of their PLC system so that operation of the fishways can be calibrated as needed and their readings at the main entrances kept in proper criteria, etc. The East Entrance readings were a foot off from the normal reading; the West was close to normal, and the S Spillway about 1-2 ft high for the channel elevation with the PLC. The Selsyns Gage and Electronic Sensor Probe are used to assess elevations at the sites wherever possible.

John Day Dam – Doug Case, ODFW, and I inspected the John Day adult fish facilities on August 8. Project Q was 137.5 kcfs during the inspection with 9 turbine units operating. Turbidity was 6.0 ft with the water temperature at 69°F. Two north shore (WA) and three south shore (OR) fish pumps were operating to supply flow to the fishways.

OR fishway – During the inspection, the South (OR shore) fishway entrance was operating with a gate depth at SE-1 of 8.5 ft on the gage and 8.2 ft at the Panel. Head differential was 1.1 ft using the gage reading and 1.2 ft using the Panel. For this inspection, there was sufficient depth and head at the South Entrance. The two main entrances at the north powerhouse (NE-1 & NE-2) were submerged about 7.7-7.8 ft with 1.4 ft using the gages and 8.3 ft submerged with 1.4 ft head differential using the Panel reading. We believe the difference was primarily caused by the Project restarting and setting up the fishway shortly before our inspection (**divers inspecting the channel and junction pool area for loose diffusers, etc. The divers were inspecting the North Shore after our inspection of that side.**) The gate depth readings were low (less than 8.0 ft). Water velocity recorded along the powerhouse collection channel averaged about 1.8 fps during the inspection. Ten floating orifice gates were operating satisfactorily along the powerhouse collection channel. The picketed lead section at the counting station and the exit from the fish ladder was clear of debris. The depth of water over the weirs was 1.0 ft.

WA fishway – One main entrance gate is operated at the WA shore fishway. The Gage and LED readings were within 0.2 ft so no calibration was required. The gate depth was 8.6 ft with the head differential reading 1.1 ft average. Readings from the WA shore fish ladder were as follows: the picketed lead section at the counting station and the exit from the fish ladder was clear of debris. The depth of water over the fish ladder weirs was 1.0 ft.

Overall, the adult fish passage facilities were up and down for the day due to the diving operation of the project. The fish ladders were not affected by the dive operations.

Juvenile Fish Facility – The Smolt Monitoring facility was operating during the August inspection. The JBS screen cleaners were finally operating in cycle mode in automatic operation.

McNary Dam – Larry Swenson, NMFS, completed an inspection of the fishways on August 24. Project Q was 114 kcfs with no spill and 10 turbine units operating, all on the north end of the powerhouse (Units 5-14). River temperature was 68°F with the turbidity reading 6.0 ft. A fishway status report was obtained prior to the inspection to compare on-site elevation readings with computer readings.

OR fishway – Three fish pumps were operating with pump angles recorded at 24° on average. About 450 cfs flow from the juvenile bypass system was joining the auxiliary water at the north end of the powerhouse collection channel. Gravity flow water from the forebay is also added in the lower end of the OR fish ladder. All auxiliary water systems were operating through the month.

The South Powerhouse and North Powerhouse entrance gates were submerged 9.5 to 9.9 ft below tailwater elevation, with the head differential ranging between 1.3 ft and 1.5 ft during the inspection. Both gate depth and head differential were found within proper criteria range at the powerhouse entrances. The orifice gates along the collection channel were operating satisfactorily. The velocity reported at the south end of the collection channel was about 0.8 fps, and at the northern end of the channel it was estimated at 2.1 fps. The depth of water over the fish ladder weirs was 1.0 ft. The exit from the fish ladder and the picket leads at the fish counting facility were reported clear of debris.

WA fishway – The fish turbine operated by North Wasco PUD was supplying sufficient flow to the WA shore fishway entrances to meet criteria. Entrances WFE-2 and WFE-3 were operating with head differential of 1.5 ft and the Gates submerged an average depth of 9.4 ft below tailwater elevation during the inspection. The exit from the fish ladder and the picket leads at the counting station were clear of debris. The depth of water over the fish ladder weirs was satisfactory with 1.0 ft reported for the inspection.

Overall, the adult fish passage facilities were operating within normal criteria at all main entrance gates on this July inspection. The computer printout was compared with the actual on site readings and no calibration appeared necessary; all readings were within 0.2 ft. **The velocity at the South end of the collection channel was less than criteria, only 0.8 ft reported on this inspection.**

Juvenile Fish Facility – Debris in front of the project was basically non-existent. The screens, orifices, and other juvenile fish facility equipment appeared to be operating satisfactorily.

Priest Rapids Dam – Melissa Jundt, NMFS, completed an inspection of the adult fish facilities on August 29. Project discharge was 81.9 kcfs; 1.0 kcfs through spill and the remainder through five main turbine units. Water temperature was 65°F with the turbidity reading 12.4 ft. Fish pumps (tailwater) and gravity-flow water (forebay) discharge water to a large supply pool that distributes this water through diffusers that supply water in the junction pool area and near the main fishway entrances.

Left Bank Fishway – At each end of the powerhouse, a slotted entrance is open to attract adult fish into the fishway/channel that leads to the fish ladder. The orifice gates are shut down and will be through the end of the season. Gate LSE-4 was recorded with 1.1 ft head differential and Gate LSE-2 with 1.2 ft head differential. Both gates were within criteria range of 1.0-2.0 ft; Gate LSE-2 met the target differential. Water velocity reported at the eastern end of the collection channel was 2.0 fps and was within the criteria range of 1.5 to 4.0 fps. The exit from the fish ladder was reported clear of debris. The depth of water recorded over the ladder weirs was 1.2 ft.

Right Bank Fishway – Slotted entrance (RSE-1) was operating with 1.1 ft of head differential at time of inspection using the staff gages. The computer readout listed the reading at 1.3 ft. The head differential was reading between the acceptable criteria range of 1.0 and 2.0 ft. The fish ladder exit was reported clear of debris. The depth of water recorded over the fish ladder weirs was 1.0 ft.

Overall, the project was spilling through Gate 22 to pass juvenile and adult fish to below the project. The adult fish passage entrances were operating within criteria ranges (1.0 to 2.0 ft) but below target elevations at LSE-4 and RSE-1. The project also had a transformer failure that affected short-term operation of the fish passage facilities (several hours). WDFW operates an adult trap located on the Left Bank fish ladder near the ladder's exit; a problem was reported in early September relating to the safe operation and ability of the trap to function due to suspected increase in milfoil and other grasses blocking the entrance to the adult trap.

Wanapum Dam – Melissa Jundt, NMFS, completed an inspection of the fish facilities on August 29. Project discharge was 57.5 kcfs with 1.7 kcfs passing through spill and the remainder through six main turbine units. The spilled flow is used to pass juvenile fish or adult fallbacks at the project. The water temperature was reported 64°F with the turbidity reading same as at Priest Rapids Dam.

Left Bank fishway – Two fish pumps operating at 140-rpm average, and gravity-fed water from the forebay of the project supply water to the adult fishways. The Main Entrance gates are slotted and rely on meeting head differential criteria of 1.0 to 2.0 ft (range) with the preferred target of 1.5 ft at the SE-2 and 1.25 ft at SE-3. During this inspection, the SE-2 Gate had 1.9 ft and the SE-3 Gate, 1.6 ft head differential. Both readings were within the proper range and exceeded the target differential as well. All orifice gates were closed along the powerhouse collection channel. The water velocity was estimated at 2.5 fps. The exit from the fish ladder was reported with some amount of debris. The depth of water recorded over the fish ladder weirs was at 1.2 ft.

Right Bank fishway – Gravity-fed water from the forebay of the project supplies flow to the main entrance gate (REW-2). On this inspection, the head differential measured 1.4 ft and was within a criteria range of 1.0 to 2.0 ft. The exit from the fish ladder was clear of debris. Depth of water over the fish ladder weirs was 1.2 feet.

Overall, the fish facilities were operating within criteria at all points checked. **The main change from the earlier inspections was the closure of the orifices along the powerhouse collection channel.**

Rock Island Dam – Denise McCarver, WDFW, completed an inspection of the fish facilities on August 27. Project discharge was 130.8 kcfs with flow passing through 8 turbine units at the new powerhouse, and 1 unit operating at the old powerhouse. No spill for juvenile fish was occurring during this inspection. Turbidity was reported at 13.0 ft with the water temperature reading 64.8° F.

Left Bank fishway – Water from the immediate forebay supplies flow through the diffusion system to the two downstream entrances. The criteria ranges for gate depth (6.0 ft minimum) and head differential (1-2 ft) are normally met under any river flow scenario. The gates were submerged 6.7 ft and below tailwater with the ΔH at 1.3 ft. The cable on LO-5 was repaired from the previous inspection. The exit from the fish ladder and the picket lead section at the counting station were clear of debris. The depth of water over the ladder weirs was 1.1 ft.

Middle fishway – Gravity-flow water from the forebay of the project is directed through the diffusion system to the downstream gate and the side entrance. The downstream gate was submerged 8.7 ft (criteria = 8.5 ft or $>$) with the ΔH reported at 1.3 ft. The side entrance is fixed-open and depends on “head” only to be within criteria. The gate depth and head differential were found within criteria ranges on the August inspection. The exit from the fish ladder and the picket lead section at the counting window was reported clear of debris during the inspection. The depth of water over the ladder weirs was 1.1 ft.

Right Bank fishway – The gravity flow water (100% open) plus three fish pumps supply water to the Right Bank fishway. The main entrances are fixed-open at 3-ft and require a minimum head differential of 1.0 ft to

be within criteria. The RPEs were reported with 1.3 ft average “head”, 1.2 ft “head” at the LPE, and 1.1 ft at the TRE (downstream) entrance. The velocity in the left powerhouse collection channel was measured at 4.6 fps. The Attraction Water jet was operating at the Right Bank fishway. The exit from the fish ladder and the picket lead section at the counting station was clear of debris during the inspection. The depth of water recorded over the fish ladder weirs was 1.1 feet.

Overall, the adult fishway entrances were within acceptable criteria for the August inspection. Grass was building on the intakes to the fishway and keeping the grass removed from the fish facilities appears to be the main problem at present.

Rocky Reach Dam – The adult fish passage facilities were inspected by Denise McCarver, WDFW, on August 27. Project discharge was 108.7 kcfs with flow directed through 5 main turbine units. No spill was occurring during this inspection. Water temperature was 63.5°F with the turbidity reading 17.5 ft. Three fish pumps were operating at 47% wicket gate opening. The main spillway entrance remained closed.

Fishway Entrances -The left powerhouse entrance gates are operated to maintain a minimum gate depth of 10 feet or more, while the right powerhouse entrances are fixed-open at 3-ft. The Spillway Gate was closed. Two entrance gates were operating at the right powerhouse (RPE-1 and RPE-2) and two gates at the left powerhouse (LPE-1 and LPE-2). The LPEs were submerged 12.8 ft with a head differential of 1.3 ft; while the right powerhouse entrances had satisfactory “head” with 1.0 ft recorded. In the collection channel, there was an approximate 1.6 ft drop in elevation from the LPEs to the RPEs while the tailwater elevation dropped only 0.3 ft resulting in the minimum 1.0 ft head differential at the RPEs. Velocity through the transportation channel was 1.8 fps. The exit from the fish ladder and picket lead section was clear of debris. The depth of water over the ladder weirs was 1.0 ft. Orifice gates operating along the collection channel were in slots 1, 2, 3, 14, 16, and 20.

Overall, the fishway was operating at satisfactory criteria levels relating to gate depth and head differentials at the main entrance gates for the August inspection. The surface collector was in operation through the month. The trashracks on the fish pump intakes were cleared of grasses and milfoil that has been floating down the river in large mats this late summer. The work and shut down of the pumps was completed during the evening hours on 8/23. This should improve pump efficiency for the adult facility operations.

Wells Dam – Stewart Mitchell, WDFW, completed an inspection of the adult fish facilities on August 27. Project discharge was 134 kcfs with 9 main turbine units operating. Spill for juvenile fish protection was 10.0 kcfs for the inspection. River temperature was 64°F. Readings from the control room are taken which includes the hydraulic data and turbine/spill operations that are occurring at time of inspection. After that information is recorded, the inspector and an operator with a radio go to either the East or West entrance and record the staff gage, deck gage, and call the control room operator to obtain the computer readings for the channel and tailwater elevations. These readings should come within 0.2 ft on a normal inspection.

East and West fishways – At the Wells project, both the east and west fishways are of similar design. Two fish pumps are located on each shore and supply attraction flow to the fishway entrances. The downstream gate operates at 8-ft open with head differential targeted for 1.5 ft at both fishway entrances.

At the **East** fishway, the channel and tailwater elevations were similar among the Control Room gages, the deck gages, and the staff gages. The head differential was 1.6 ft and was within normal criteria range. Depth of water over the ladder weirs was 1.1 ft. The east fish ladder reported a differential through the exit pool to the forebay of 1.0 ft. The normal head through that exit trash rack ranges from 0.5 ft to 0.8 ft so it was high and will likely require cleaning.

At the **West** fishway, all measuring gages and computer readings were similar for channel elevation and for the tailwater elevation. The head differential measured was only 1.0 ft. The end gate had been reduced from 8.0 ft to 6 ft the previous week and was further reduced to only 4-ft by this inspection date. **Douglas PUD had coordinated with NMFS and WDFW regarding the problem that now exists at Wells Dam. According to Rick Klinge, PUD biologist, there was approximately 2-ft head differential across the diffuser gratings (side) and to avert potential of blowing off the gratings, flow through the grating system was reduced until the problem could be further addressed by the project. Initially, a camera and potentially a diver will be used to assess the amount of milfoil and grasses on the diffuser gratings.** The depth of water over the fish ladder weirs was 1.1 ft. The exit from the west bank fish ladder was 1.0 ft and was similar to the East fishway differential of 1.0 ft and **both exits should be cleared of debris.**

Overall, milfoil and grasses have caused the project to change normal operations of their fish passage facilities due to the build-up of these grasses on the diffuser gratings (mainly west fishway). This situation should be remedied as soon as possible to preclude damage to their screens, etc. Trapping was occurring from Monday through Wednesday from 0800 through 2000h on the West Ladder.

Ice Harbor Dam - Steve Richards, WDFW, completed an inspection of the Ice Harbor fish facilities on August 29. Project discharge was 18.3 kcfs with two of six main turbines operating to pass inflow; there was no spill occurring during the inspection. The turbidity reading was 7.7 ft with the water temperature 69°F.

South Shore fishway – All eight electric pumps and 200-cfs flow from the juvenile bypass system were operating to supply water to the south fishway. The South Shore entrance was operating with 1.9 ft head differential and the gate submerged 7.5 ft. The Computer Status Report showed the Entrance operating with 1.1 ft head differential and 7.6 ft of depth. **The channel elevation from the PLC measured 0.8 ft different from the staff reading; the tailwater elevation was the same for both readings.** The NPE was recorded with 1.4 ft of “head” and the gate submerged 6.5 ft below tailwater. The PLC reading at the north powerhouse entrance channel elevation was 0.3 ft different from the staff gage reading and 0.1 ft different for the tailwater elevations measured. The gate was not on sill. The water velocity through the collection channel recorded 2.4 fps at the electronic gage. Seven orifice gates were operating along the powerhouse collection channel. The exit from the south fish ladder was clear of debris for the August inspection. The picketed lead section near the counting station was also free of debris. The depth of water over the south fish ladder weirs was 1.0 ft.

North Shore fishway – Three fish pumps were operating at the north shore and supplying water to the north shore fishway entrance. The entrance gate was submerged 5.6 ft below tailwater elevation with the head differential at 1.4 ft using the staff gage, and 5.7 ft submerged with 1.1 ft head differential using the display (LED). The snapshot computer printout reported head differential of 1.1 ft and 5.7 ft depth. The exit from the north fish ladder and the picketed lead section at the counting station was also clear of debris. The depth of water over the fish ladder weirs was 1.0 ft.

Overall, the adult fish facilities were operating less than criteria levels at the North Powerhouse main entrance gate with the S Shore entrance on sill and meeting head differential. The N Shore entrance met head differential not depth criteria. The juvenile fish facility and components were operating satisfactorily. **The Project should calibrate their entrance elevations so that the staff gages and PLC readings match on the south shore and north powerhouse.**

Lower Monumental Dam – Steve Richards, WDFW, inspected the fish facilities on August 29. Project discharge was about 15.5 kcfs with unit one operating and no spill occurring during this inspection. River temperature was 69.4°F, with the turbidity reading 7.5 feet.

North Shore fishway – Three turbine driven fish pumps operating at 74 rpm average and about 200 cfs excess juvenile bypass flow were supplying water to the north and south shore fishway entrances and powerhouse collection channel. The north shore entrances were submerged 8.7 ft average depth with the “head” measured at 1.2 ft. No orifice gates are operating along the collection channel in 2001. The water velocity reading was estimated at more than 2.0 fps. The south powerhouse entrances were **on sill** and submerged 6.5 ft with 0.9 ft of “head”.

The exit from the north fish ladder was reported clear of debris, as was the picket lead section at the counting station. The depth of water over the fish ladder weirs was 1.0 ft.

South Shore fishway – The north shore fish pumps supply flow to the south fishway entrances along with about 80 cfs flow from the fish ladder. One entrance is a fixed-open gate that remains 6 ft open while the other gate is to be submerged 8.0 ft or more to be within criteria. On this inspection the adjustable gate was submerged 7.9 ft and had 1.6 ft “head”. The digital display showed the gate at 7.8 ft submerged with 1.8 ft head differential. The exit from the south fish ladder and the picket lead section at the fish counting station was clear of debris. The depth of water recorded over the fish ladder weirs was 1.0 ft on the south ladder.

Overall, the adult fish passage facilities were operating with head differentials and gate depths close to satisfactory criteria ranges. **The main problem appears to be that the North shore and South powerhouse entrances should be checked for calibration as they differed by 0.9 ft between the computer system and on-site staff gage readings.** The Juvenile fish facilities were operating satisfactorily on this inspection with gatewells clear of debris and no report of other problems such as blocked orifices, etc.

Little Goose Dam – Josh Hanson, ODFW, inspected the adult fish facilities on August 24. Project discharge was 19.8 kcfs with flow through Units 1. Water temperature was 69.1°F with a turbidity reading of 5.9 ft. Three turbine-driven pumps operating at 74-rpm average, and excess flow from the juvenile bypass system were supplying water to the adult fishway.

The South Shore fishway entrances, SSE-1 and SSE-2, were on sill and submerged about 8.3 ft average depth with the head differential at 2.1 ft using the staff gage reading, and 8.1 ft gate depth and 2.1 ft head differential using the FSC Board Reading. Channel velocity recorded at the south end of the channel registered about 0.9 fps, with the velocity up to 2.9 fps at the north shore channel. Orifice gates along the powerhouse collection channel remained closed for the 2001 adult migration season. The North Powerhouse entrances were on sill with the gates submerged an average of 5.2 ft with the “head” at 1.9 ft using the FSC Board reading and 1.8 ft using the staff gage. The North Shore Entrances were submerged 6.0 ft deep (FSC and Staff readings) with the “head” at 1.5 ft using the FSC Board reading and 1.8 ft head differential using the staff gage readings. The exit from the fish ladder and the picket lead section at the counting station appeared clear of debris although there was a 0.2 ft differential at the count station on this inspection. The depth of water over the ladder weirs was 1.1 ft.

Overall, the velocity reported at the South end of the collection channel was 0.9 fps and was less than the 1.5 fps called for in the FPP. The main entrance gates were within satisfactory criteria limits given the fact that the SSE and NPE were resting on sill and no further depth could be achieved. **All tailwater staff gages were dirty and should be cleaned. The SSE entrance staff gage was also dirty. The NSE channel lights through the transport tunnel were repaired during the afternoon of August 8.**

Lower Granite Dam – Josh Hanson, ODFW, completed an inspection of the adult fish facilities on August 14. Project discharge was 31.0 kcfs with 2 of 6 main turbine units operating. Water temperature was 76.6°F (taken at the count station) with the turbidity reading at 3.0 ft. Two electric fish pumps (1 and 3) were supplying flow to the adult fishway entrances and powerhouse collection channel.

The South Shore entrances were submerged 8.1 ft average depth with ΔH of 1.6 ft and 1.8 ft, respectively using the staff gage and the FSC Board readings. The North Powerhouse entrances were submerged an average of 5.6 ft with ΔH of 1.4 ft using the staff gage, 5.4 ft average with 1.5 ft head

differential using the FSC Board reading. The weirs were resting on sill at the NPEs so no further depth could be attained. The velocity in the powerhouse collection channel was about 0.9 fps at the south end of the powerhouse collection channel and 2.5 fps at the North Shore. Four orifice gates operate along the powerhouse collection channel [1, 4, 7 and 10]. At the North Shore, Gates NSE-1 and NSE-2 were submerged 5.9 ft below tailwater elevation with the head differential reading of 0.9 ft. The exit from the fish ladder was reported clear of debris as was the picket lead section at the counting station. The depth of water over the fish ladder weirs was 1.1 ft.

Overall, the August inspection gave lower than desired gate depths but tailwater elevations prevented any further depth at the NPEs. **There remains no staff gage or other site gage to measure the North Shore Entrance (tailwater elevation).** The velocity at the south end of the powerhouse collection channel was about 0.9 fps and falls below the 1.5 fps minimum criterion. **The inspector was unable to see the NPE channel lights; they may be burned out. The NSE gates had reduced head differential, 0.9 ft and less than the required 7.0 ft depth.**