U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#37-2014

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: November 7 - 13, 2014

Turbine Operation

McNary had 11 units available for power generation this week. The soft constraint one percent criterion began on November 1. This week, operational units ran outside the criteria due to units outages in support of research equipment installations and at the BPA's request. Unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Dam.

Units	Outage Dates	Outage Length	Main Reason for Outage
11	Sep 18, 2013 to Jan 31, 2015	About one year and 4.5 months.	Turbine bearing issue continues.
4	Mar 27 to Jan 31, 2015	About 10 months.	Turbine bearing issue continues.
9	Aug 11 to Mar 25, 2015	About 7.5 months.	Maintenance then rewind contract.
12, 13 & 14	Nov 7	About 3.5, 6.8 & 6.8 hours each.	Dive installation of adult fallback study equipment.
14	Nov 10	About 10.1 hours.	Dive installation of study equipment at TSW in bay 20.
3	Nov 12	About 10 hours.	Contract inspection and study equipment installation on ESBS.
1 & 2	Nov 12	About 2.8 & 2.6 hours each.	Study equipment installation on ESBS.
5, 6 & 7	Nov 13	About 3.3, 3.3 & 2.6 hours each.	Study equipment installation on ESBS.
1	Nov 13	About 17 minutes.	Unit down for possible dive at SFEW2.

Adult Fish Passage Facilities

On November 13, a dive was planned for the retrieval of the camera located near SFEW2. However, once unit 1 was taken out of service and the Oregon ladder was partly taken out of service, the rigging crew was able to retrieve the camera manually with attached the hoist and cable. The project staff also installed bulkheads at floating orifice entrance W-14 in the vicinity

of Unit 5, but was unable to remove the floating weir for future rehabilitation. Weir removal may be postponed until the winter ladder outage.

From 1203 to 1400 hours on November 13, the Oregon ladder was placed in orifice flow mode in support of the dive operations. Both active fish pumps were taken out of service and both powerhouse entrance weirs were in placed in manual mode. SFEW1 was lowered to sill and SFEW2 was raised (i.e.: closed). NFEW2 and NFEW3 remained in their usual positions.

On November 7, 10 and 12, the McNary fisheries biologist performed measured inspections of the adult fishways. The inspection on November 12 took place prior to end of primary juvenile bypass operations, which is discussed below.

Fish Ladder Exits: During measured inspections, both ladder exits met all Fish Passage Plan criteria. The exits themselves had no debris issues this week.

At the Washington exit, the operators reset multiple false alarms at weir 339. On November 13, the count window cleaning brushes were found in the lowered position. We quickly raised them. The project staff plans to install new seals on the ladder exit bulkheads soon.

As mentioned above, Oregon ladder exit was placed in orifice flow mode for about two hours on November 13. Although automatic exit weir operation was restored following the dive operation, considerable effort was required to return the exit to automatic mode. Traveling screen differentials remain low. The operators reset two false traveling screen differential alarms this week. On November 10, these screens underwent scheduled mechanical maintenance.

Fishway Entrances and Collection Channel: All Washington ladder entrance inspection points met criteria. In the near future, the project staff plans to the LED (Light Emitting Diodes) displayfor W2 and W3 with a panel type display.

All Oregon ladder entrance inspection points met criteria except on November 7, when SFEW2 depths measured 7.3 feet. The weir continues to experience calibration drifts. On November 13, for about two hours, as described above, all four entrance gates were in manual mode. Crews experience difficulties raising SFEW2, weir control and operation will be examined more closely at a later date. Electrical upgrades of the Oregon entrances will be completed in the near future.

Starting November 12, the juvenile system ceased supplying supplemental flow to the north powerhouse entrance. Changes in juvenile system operation are discussed more fully below. On November 13, as mentioned above, floating entrance W-14 was closed following the insertion of bulkheads. This entrance will resume operations after the weir is rehabilitated. The 1000 cfs conduit discharge valves removed last winter will be repainted soon. Surface collection channel velocities averaged 1.5 feet per second this week.

Auxiliary Water Supply System: For the report week, the PUD turbine unit in the Washington ladder had no interruptions in service.

Fish pumps 1 and 3 ran with blade angles of 30 degrees with three interruptions in service. On November 12, both pumps were out of service for 15 minutes for an electrical bus switch in support of a contractor working in the powerhouse. Later that day, pump 3 was taken out of service 10 minutes due to a governor oil temperature issue. Finally, as reported above, both pumps were out of service on November 13 for about two hours in support of a potential dive at SFEW2. Pump 2 is currently out of service for major overhaul under contract. This work should be completed by September, 2015.

The juvenile facility concluded supplying the usual 450 cfs to the north powerhouse pool on November 12 at approximately 0945 hours.

Juvenile Fish Passage Facility

On November 12, fall primary bypass season concluded with the start of emergency bypass due to severe winter weather and failure of the rectangular screen cleaner.

On November 11, wind speeds averaged 35 to 50 mph with the highest gust recorded at 85 mph. The wind was from the northeast or east. When the wind was easterly, waves washed over the tops of the forebay bulkheads and drenched the juvenile collection channel. The splashing vigorous enough, that the west wall of the channel was getting wet. Waves even topped and penetrated the new concrete bulkheads with Plexiglas covers. The waves were washed under the covers and around their edges, which might have contributed to the failure of the rectangular screen cleaner. Fortunately, the wind switched to a more northerly direction, which allowed the collection channel to dry out before the severe cold temperatures began. The boat dock on the Oregon shore was severely damaged.

At 1045 hours, the rectangular screen cleaner triggered an alarm. The maintenance staff found the cleaner stalled half way downstream. The mechanism only restarted after opening and closing the associated electrical breaker. Following the breaker reset, the cleaner operated properly once. At 1330 hours, the mechanism stalled again at a different location. Again, the breaker had to be opened and closed. At this point, we removed the device from service as debris loads were extremely light and the air burst system was keeping the screen clean. At about 2030 hours, during another attempt to run the device, the cleaner again stalled in yet a different position. On November 12, at about 0830 hours, we made a last attempt to get the mechanism to run properly. Again, it stalled in the same position as the night before. Each time, we were able to park the device.

On November 12, from approximately 0945 to 1315 hours, we switched the juvenile fishway from primary bypass mode to emergency bypass mode. Before the switch, the west floor valve required new fuses and the lighting in the valve pit had to be replaced. This action became necessary to protect the channel and to prevent freeze breakage at the facility. A week of severe winter weather was forecasted, which included day time temperatures below freezing. The

vicinity of McNary Dam then received about two inches of snow overnight. Considering the weather and rectangular screen cleaner problems, the project was fortunately that the collection channels issues were not worse than they were. Following the switch in operations, a freezing fog formed in the collection channel.

Forebay Debris/Gatewell Debris/Oil: Floating forebay debris consisting mostly of milfoil and woody material was light until the wind storm of November 11. After the storm dissipated, the debris load was minimal. We noted no fresh incoming debris and there was no debris at the spillway. Trash rack differential readings revealed no problems and no racks were raked this week. We observed no problems in the gatewell slots.

ESBSs/VBSs: ESBSs are deployed in all units except units 4 and 11, which are out of service. The screens in slots 1A, 1B and 13C remain in timer mode. On November 11, the operator reset the screen in slot 1A. On November 12, the electrical staff adjusted programming for the screens in slots 1A and 1B slots after excess cycle counts were observed. On November 8 and 12, after triggering alarms, the screens in slots 6A and 2B were respectively switched to timer mode. No camera inspections occurred this week due excessive workloads and the federal holiday.

VBS differential monitoring efforts revealed one screen out of criteria when the unit was operating at 72 megawatts. On November 7, 10 and 12, the project cleaned this screen and 14 others as a precautionary measure. We observed no ESA listed fish mortalities or lamprey mortalities. VBS rehabilitation continues with unit 11 as the staging area.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: On November 12, the collection channel system was switched to emergency bypass as described above. Forty two orifices were open all week except for the approximately 3.5 hours required to switch the system to emergency bypass mode. Following the switch, the dewaterer and others system were winterized so light off-season maintenance could begin. During VBS cleaning, while we were in primary bypass, we closed the orifices at the slots the work was being performed and opened spare orifices in adjacent slots to maintain proper channel elevations. On November 11, we noted water in the orifice actuator air supply line. We began to bleed this moisture off daily. On November 13, due to the moisture issue, we had to install new intake ports on seven orifice actuators.

As mentioned above, the rectangular screen cleaner developed electrical issues prior to the switch to emergency bypass operations. In addition, the west floor valve required new fuses. Lighting also needed replacement in the valve pit on one of the platforms. There were no other technical problems to report this week.

Bypass Facility: On November 12, emergency bypass began in order to protect the facility from possible freeze breakage. Winterization is now completed and full scale maintenance is now in progress. No PIT tag detection occurs during emergency bypass. Just before the change in operations, we noted a leak in the primary bypass flume joint just above the primary bypass switch gates. Separator rehabilitation continued. This week, we recovered an unclipped subyearling Chinook mortality and one juvenile lamprey mortality in the separator.

River Conditions

River conditions during the week are outlined in Table 2 below as provided by COE data. Our data day runs from 0000 to 2400 hours each day. On November 15, at 0001 hours, the TSW in bay 20 will be opened in support of the adult fallback study.

Table 2. River conditions at McNary Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temp. (^{o}F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
132.7	110.6	0.0	0.0	57	54	6.0	6.0

*Temperature taken from the Unit 1 Scrollcase.

Other

Inline Cooling Water Strainers: The next cooling water strainer examination will occur in early December.

Invasive Species: The next zebra mussel station examination will occur in late November.

Avian Activity: Bird counts are no longer occurring.

Repairs to the outfall water cannon pump are still being arranged with January or February, 2015 planned as the target date.

During other inspections, we noted in the tailwater area, gulls and cormorants feeding in the powerhouse flow. We noted gulls roosting on the outfall pipe one afternoon. In addition, we observed gulls and cormorants roosting on the navigation lock wing wall, which is part of the spill zone. Grebes were noted on the water below the spillway. Finally, we occasionally observed gulls and cormorants at the bypass outfall until the start of emergency bypass operations. Now the birds are situated at the emergency bypass outfall. Bird numbers are affected by the juvenile shad out migration, the weather and their avian migratory patterns.

In forebay locations, we observed an occasional gull or group of gulls as well as an occasional cormorant. Grebe numbers were stable. Up to 70 grebes were observed at a time until the wind storm of November 11. After the wind storm, only an occasional grebe was noted. No grebes were observed in the gatewell slots or the juvenile channel. We observed gulls occasionally on the rock by the Washington boat dock.

Research: The adult lamprey passage study concluded this week with the removal of the camera near SFEW2 and the equipment at the picketed leads. On November 14, the last transducers will be installed on the ESBSs, which will allow the adult steelhead fallback study to begin. The University of Idaho continued preparations for a winter adult steelhead radio tracking study.

Project: Ice Harbor
Biologist: Ken Fone
Dates: November 7 - 13, 2014

Turbine Operation

Unit 3 was taken out of service on July 7 at 1346 hours to investigate a generator electrical grounding problem and for annual maintenance, and remains out of service due to an oil leak from the hub. The plan for the fall and winter is to convert unit 3 into a fixed-blade unit to resolve the problem. Unit 6 was taken out of service at 1048 hours on October 6 for annual maintenance. Unit 2 was removed from service on October 14 at 0940 hours for digital governor installation. Unit 1 was forced out of service at 1048 hours on November 8 because of excessive vibration from the STS in slot 1B. This STS has piping mounted on it for the release of sensor fish. Unit 1 was returned to service at 0749 hours on November 10 after engineers determined that it was safe to operate. All available units were operated within 1% of peak turbine efficiency as specified in the Fish Passage Plan.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on November 10, 12, and 13.

Fish Ladders: The north fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. The south fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. Criteria for head differentials at ladder exits and picketed leads, and depth over the weirs are 0.5 feet or less, 0.3 feet or less, and 1.0-1.3 feet, respectively. Fish ladder exits were clear of debris and the bubblers were operating satisfactorily. The north and the south shore picketed leads were placed in their raised positions on November 3. Adult fish counts ended for the season on October 31. The south shore forebay debris boom was found to be disconnected from its shoreline attachment point on November 12. The boom was reattached on November 13.

Fishway Entrances and Collection Channel: The south shore entrance (SFE) weir depths and channel/tailwater differential were in criteria, except for a differential of 2.1 feet on November 12 and 13. The north powerhouse entrance (NFE) depth and channel/tailwater differential were in criteria on all inspections. The north shore entrance (NSE) depth and channel/tailwater differential were in criteria on all inspections. Fishway entrance criteria are 8 feet depth or greater, or on sill. Channel/tailwater differential criteria are 1 – 2 feet.

Auxiliary Water Supply System: Two of the 3 north shore fish pumps were operated throughout the week. Six of the 8 south fish pumps were operated.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was little to no debris observed in the forebay and gatewells.

STSs/VBSs: Most of the STSs are in position for juvenile fish guidance and have been in cycle-run mode since July 21. Unit 3 STSs were removed for the season on November 4, since the unit will remain out of service past December 15. Unit 1 STSs were found to be mistakenly in continuous run mode on November 10 and were switched back to cycle mode. Unit 1, 2, 4, 5, and 6 STS inspections were performed on October 20 and 22. No significant problems were found. The next STS inspections are scheduled for the week of November 17.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass was placed in operation on March 17. The collection channel operated with 20 orifices open. The bird abatement hydro-cannon was turned off and winterized for the season on November 13 due to increasing ice buildup on the outside of the hydrocannon and bypass outfall pipe.

Juvenile Bypass Facility: The bypass is in operation.

Fish Sampling: Sampling operations began on April 2 and ended on July 15.

Removable Spillway Weir: Spill in support of fish passage began on April 3 and ended on August 31. The contractor for the spill bay 2 ogee and flow deflector modifications continued concrete cutting and chipping of the ogee, as well as diving to install temporary bulkheads in preparation for the flow deflector modification.

River Conditions

River conditions during the week are outlined in Table 1 below.

Table 1. River conditions at Ice Harbor Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (^{o}F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
24.3	20.3	0	0	58	57	7.8	7.6

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: Monthly turbine cooling water strainer inspections took place on October 20 and 22. A total of 1 Siberian prawn and approximately 250 juvenile shad mortalities were found. The next strainer inspections are scheduled for the week of November 17.

Invasive Species: No new exotic species have been found.

Avian Activity: Contracted hazing of piscivorous birds for 16 hours per day began on April 1 and ended on June 30. The piscivorous bird count program at the project began on April 1 and ended on July 15. Moderate numbers of gulls, cormorants, and grebes, along with a few pelicans, were seen around the project during the week.

Research: Researchers began releasing sensor fish through unit 1 during this reporting period for the turbine characterization study, and plan to continue through early December.

Project: Lower Monumental
Biologists: Bill Spurgeon and Ray Addis
Dates: November 7 - 13, 2014

Turbine Operation

Available units are being operated within 1% soft constraint operational criteria. Unit 6 remains out of service for six year overhaul.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on November 12 and 13.

Fish Ladders: Fishway exit head differentials and depths over the weirs were within criteria (≤ 0.5' and 1.0'-1.3', respectively) on all inspections. Picketed lead head differentials were in criteria (≤ 0.4' and ≤ 0.3' for north and south shore fishways, respectively) on all inspections.

Fishway Entrances and Collection Channel: NSE1 and NSE2 weir gates were in depth criteria (criteria: ≥ 8' or on sill) on all inspections. North shore channel/tailwater head was in criteria (1'-2') on all inspections.

SPE1 and SPE2 weir gates were in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 6.0'and 7.0 feet. South powerhouse channel/tailwater head was in of criteria (1'-2') on all inspections.

SSE1 weir gate was in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 7.5' and 7.8 feet. SSE2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head was in criteria (1'-2') on all inspections.

The collection channel velocity remained in criteria (1.5 - 4.0 ft/sec) this week.

Any criteria violations at the fishway entrances are related to the failure of the PLC (Programmable Logic Circuit) for automated control. Without automated control, the FCRG (Fishway Control Regulating Gate) drifts closed causing the fishway entrance head to go out of criteria at the south shore entrances. Operators are manually controlling the FCRG and fish pumps to maintain head and depth criteria at fishway entrances. The loss of the fishway PLC also caused all weir gates to be placed in local control. This results in criteria violations if monitoring and adjustment does not occur as tailwater level fluctuates. To minimize this, SPE1 and SPE2 are placed on sill.

The replacement PLC for automated control of the fishway has been received. It is currently undergoing programming. The latest update on getting the automated system back in service is February 2015. The operators have been instructed to conduct a physical inspection on night shift to replace the FPP inspection via data screen conducted normally on that shift.

Auxiliary Water Supply System: All AWS pumps were in service and operating on the remaining days of the period.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 134 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 30% surface coverage. Oil absorbent pads were placed in 4 gatewells due to a sheen that was likely caused by grain dust.

STSs/VBSs: STSs are operating in cycle-run mode. STSs were inspected November 4, 5 and 6. All screens passed inspection.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel is operating with 18 orifices open.

Collection Facility: The facility was dewatered for winter maintenance on October 15.

Transport Summary: Fish transport is not occurring at this time.

River Conditions

Summer spill ended at 0000 hours on September 1. River conditions during the week are outlined in Table 1 below.

Table 1. River conditions at Lower Monumental Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (^{o}F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
25.0	16.4	0.0	0.0	54.0	53.0	4.3	4.2

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on November 3. Live fish included 1 prawn. Mortalities included l5 prawn and 90 shad.

Invasive Species: No zebra mussels were observed at the monitoring stations on November 3.

Avian Activity: Bird counts are presently being done in conjunction with ladder inspections. This practice will continue until April 1, 2015.

Research: No onsite research is in progress at this time.

Project: Little Goose
Biologist: Richard Weis
Dates: November 7 - 13, 2014

Turbine Operation

Turbine units 1, 4, 5 and 6 were available for all of this report period. Unit 3 was placed out of service on July 7 at 0700 hours for a planned six year overhaul. Unit 2 was placed out of service on November 3 for its planned annual maintenance. All available turbine units were operated within 1% peak efficiency range.

Adult Fish Passage Facility

Adult fishway inspections were performed on November 10, 12 and 13.

Fish Ladder: Ladder exit differentials held steady at 0 ft. (criteria $\leq$ 0.5 ft.). Water depths over diffuser 13 weirs held steady at 1.2 feet (criteria 1.0-1.3 ft.). No differential was observed at the picketed leads (criteria $\leq$ 0.3 ft.). No debris was observed at the picketed leads or at the ladder exit. The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily.

Fishway Entrances and Collection Channel: Channel to tailwater head differentials ranged between 0.9 and 1.7 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.1 and 8.3 feet (criteria $\geq$ 8.0 ft). NPE weirs rested on sill and ranged between 7.0 and 7.3 feet (criteria $\geq$7.0 ft). NSE weirs are in manual mode and depths ranged between 6.9 and 7.5 feet (criteria $\geq$ 6.0 ft.). North powerhouse surface water velocity measured between 2.0 and 2.9 fps. Collection channel surface water velocity near north shore entrance ranged between 2.0 to 2.4 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: All fish pumps operated within criteria except on November 13. All fish pumps were removed from service from 1300 to 1435 hours to allow installation of a new electrical breaker.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Estimated amounts of woody debris in the immediate forebay ranged between 0.0 and 100 sq ft.

Spillway Weir: Spillway Weir was removed from service on August 4.

ESBSs/VBSs: ESBSs operated within criteria this report period. All brushes operated as designed. All screens met criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile system continued to operate with 18 open orifices.

Transportation Facility: The juvenile collection and transportation facility is currently unwatered and is in primary bypass mode.

Transport Summary: Transportation system has ended for the season.

River Conditions

Table 1. River conditions at Little Goose Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (^{o}F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
22.8	18.5	0	0	56.5	53.4	6.0+	5.5

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were checked on November 13. No fish were found.

Invasive Species: No zebra mussels were observed on the substrate monitor on October 21. The next inspection is scheduled for November 21.

Avian Activity: USDA-APHIS bird hazing ended on June 20.

Table 2. Tailrace counts of foraging piscivorous birds at Little Goose Dam.

Date*	Time (hours)	Gulls	Cormorants	Terns	Pelicans
November 7	---	---	---	---	---
November 8	---	---	---	---	---
November 9	---	---	---	---	---
November 10	---	---	---	---	---
November 11	---	---	---	---	---
November 12	1300	10	11	0	0
November 13	1530	18	14	0	0

*Observations not taken from November 7 through November 11.

Gas Bubble Disease: WDFW Gas Bubble Trauma monitoring concluded July 28.

Research: The University of Idaho continued their adult salmonid and adult lamprey passage study.

Project: Lower Granite
Biologists: Elizabeth Holdren and Ches Brooks
Dates: November 7 - 13, 2014

Turbine Operation

All available units are being operated within the 1% soft constraint operational criteria. Unit 1 was removed from service for annual maintenance at 0716 hours on October 21. The expected return to service date for unit 1 is November 24. Unit 5 was removed from service for annual maintenance at 0657 hours on September 2. A contact issue with unit 5 blades and liner is being investigated during the outage. The expected return to service date for unit 5 is now November 18. As scheduled units 6, 4, 3 and 2 were rotated out of service for approximately four hours each starting on November 12 to allow each unit's ESBS screens to be raised.

Adult Fish Passage Facility

The fish ladder was inspected by Corps biologists on November 7, 8, 9 and 10. Visual adult fish counts concluded on October 31. Daytime video counts began on November 1and are scheduled to continue through December 30.

Fish Ladder: Fishway exit head differentials and depths over the weirs were in criteria (≤0.5' and 1.0-1.3', respectively) on all inspections. Picketed lead head differentials were in criteria (≤ 0.3') on all inspections.

Fishway Entrances and Collection Channel: NSE1 was out of criteria (criteria ≥7' or on sill) on all inspections with depth readings ranging from 4.7 to 5.1 feet. NSE2 was out of criteria (criteria ≥7' or on sill) on all inspections with depth readings ranging from 5.7 to 6.2 feet. North shore channel/tailwater head differentials were out of criteria (criteria 1'-2') on the November 7, 8 and 9 inspections. The out of criteria head differential readings were 0.8, 0.8 and 0.9 feet respectively. NSE2 has been out of service since 2011 and is currently suspended with a hoist system at a compromised depth of 630.0 feet. The gate requires a complete rehab and will remain out of service until funding is available. Entrance weir depths are being sacrificed in an attempt to maintain channel/tailwater head differential.

The NPE1 and NPE2 weir gates were in depth criteria (criteria ≥8' or on sill) on all but the November 10 inspection. On November 10 both gates were in sill criteria with a depth of 7.7 feet. North powerhouse channel/tailwater head differentials were in criteria (criteria 1'-2') on all inspections.

SSE1 and SSE2 weir gates were in depth criteria (criteria ≥8' or on sill) on all inspections. South shore channel/tailwater head was in criteria (criteria 1'-2') on all inspections.

Collection channel velocities were out of criteria (criteria 1.5-4.0 fps) on all inspections. The daily average channel velocity readings averaged 1.1 feet per second. The powerhouse electrical crew is investigating the velocity meter and looking into alternatives for replacement.

Auxiliary Water Supply System: All AWS pumps were available for service. Pumps 1 and 3 were operated. AWS pump 2 was in standby mode. Fish pump 1 is operating in "fast speed" mode to provide additional water to the fishway channel.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Forebay debris varied during the week due to wind strength and direction. Daily monitoring and removal of gatewell debris continued.

ESBSs/VBSs: ESBSs were deployed in all operational units as of November 11. Brush cleaning cycles are set for one cycle every two hours. Removal of the ESBSs began on November 12 and will be completed on November 14.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Orifices are backflushed every 3 hours.

Collection Facility: The fish facility remained in secondary bypass during the report week. Due to concerns over extreme cold weather, the juvenile collection channel and the separator complex are scheduled to be dewatered on November 14.

Transport Summary: The final fish transport truck departed Lower Granite on October 31.

River Conditions

River conditions during the week are outlined in Table 1. No spill is occurring at this time.

Table 1: River conditions at Lower Granite Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (F^o)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
25.5	19.6	0.0	0.0	55.0	52.0	5.0+	4.4

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainer inspections last took place on October 28. There were no lamprey mortalities. No other fish species were recovered. The combined unit run time was 1,003.1 hours. The next inspections are scheduled for late November.

Invasive Species: No zebra/quagga mussels were observed at the monitoring station on October 13.

Avian Activity: Daily piscivorous bird counts are taken from the juvenile fish separator platform one hour after sunrise and one hour before sunset. Maximum piscivorous bird counts are summarized in Table 2 below.

Table 2. Daily maximum tailrace piscivorous bird counts at Lower Granite Dam.

Date	Time (hours)	Gulls	Cormorants	Terns
November 7	0740	4	7	0
November 8	0735	2	11	0
November 9	0740	4	6	0
November 10	0740	5	14	0
November 11	0740	2	6	0
November 12	0740	11	0	0
November 13	0740	9	1	0

Adult Fish Trap Operations: The adult fish trap facility was shut down and dewatered on November 11.

Research

Research: Onsite juvenile fish research has concluded for the year.