U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#40-2016

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: November 25 – December 1, 2016

Turbine Operation

None of the available turbine units operated outside the soft 1% peak efficiency criteria this week. Turbine unit 13, which is out of service for a nine year overhaul, will return to service on December 5.

Adult Fish Passage Facilities

McNary fish biologists performed measured inspections of the adult fishways on November 25, 27 and 30. As previously coordinated, the Washington Ladder was taken out of service on December 1 to facilitate the installation of lamprey passage improvements in conjunction with the usual winter maintenance period.

The Washington ladder was switched from automatic mode to orifice flow on December 1 at 0001 hours. Auxiliary water conduit and exit bulkheads were installed by 0836 and 0915 hours, respectively. The ladder was inspected from the count station to tailwater elevation from 1000 to 1120 hours. Approximately twenty adult shad, one adult Chinook and one clipped steelhead smolt were evacuated to tailwater. Three adult shad mortalities were removed. Twenty four sticks ranging from ½ to 3 inches in diameter were also removed. No orifice blockages were found. The passive integrated transponder (PIT) tag detection system appeared to be in good condition.

Approximately 200 adult shad and one clipped steelhead smolt were removed and returned to the river from the count station area from 1130 to 1230 hours and from 1330 to 1430 hours. No mortalities were noted. Two large sticks were removed from this area and no blockages were observed. Fish will be evacuated from the exit weir area on December 2. The ladder will remain dewatered to approximately January 31 for the installation of lamprey passage improvements (as mentioned above), exit weir rehabilitation and winter maintenance.

Fish Ladder Exits: Both ladder exits met criteria. The head over weir criteria at both exits are to be within 1.0 to 1.3 feet. The differential criteria at the count stations are to be within 0.0 to 0.5 feet. Debris loads were minimal at both exits and along the Oregon shore. Eurasian milfoil remained an issue at the Washington exit as the trash rack required repeated cleaning.

As mentioned above, the Washington exit met all criteria during measured inspections. The exit was in manual mode from 0814 to 0949 hours during the cleaning of the three exit elevation sensor still wells on November 30. The regulating and tilting weir set points were adjusted after cleaning was completed.

The Oregon exit also met all criteria. Weir 338 will remain out of service until the winter maintenance season.

Fishway Entrances and Collection Channel: Criteria for all entrances are pool differentials measuring between 1.0 and 2.0 feet, and weir depths measuring 8.0 feet or deeper.

At the Washington ladder, all inspection points met criteria.

At the Oregon ladder, north powerhouse entrances NFEW2 and NFEW3 measured 7.8 and 7.7 feet in depth, respectively on November 30. These readings are probably due to the juvenile facility being switched to emergency bypass on November 29. All other inspection points remained in criteria.

The Oregon ladder collection channel surface velocities averaged 1.6 fps.

Auxiliary Water Supply System: The Wasco County Public Utility District (PUD) turbine unit in the Washington ladder remains out of service for runner replacement, which will be completed in December. Turbine unit testing may occur in February, 2017 at the earliest. The bypass functioned satisfactorily until December 1 at 0800 hours when the system was removed from service for winter maintenance.

Two of the three Oregon ladder fish pumps operated satisfactorily with no interruptions in service this week. Both pumps operated with blade angles of 24 degrees. Fish pump 2 is currently under contract for major overhaul. Main shaft replacement has delayed completion. Testing is scheduled for early March.

The juvenile facility continued to supply 450 cubic feet per second (cfs) to the north powerhouse pool until approximately 0730 hours on November 29, when the juvenile system was switched to emergency bypass.

Juvenile Fish Passage Facility

The fall bypass season continues. The system was switched from primary bypass to emergency bypass on November 29 from 0730 to 1007 hours due to failure of the side screen cleaning brush.

Forebay Debris/Gatewell Debris/Oil: Forebay debris loads at the powerhouse were light.

No high trash rack differential measurements were recorded and no trash racks were cleaned.

No problems were observed in the gatewell slots.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs): ESBSs are deployed in all units. ESBS removals will begin December 16. ESBS camera inspections did not occur this week due to the camera truck requiring service. A sensor that was under factory recall was replaced. The ESBSs in slots 1A, 1B, 6B, 6C, 8C, 12A and 12C remained in timer mode. The ESBS in slot 12C was recalibrated on November 25, 26 and 27. The brush was not completing a full cycle at times. The electrical staff adjusted the brush motor's upper load limit on November 28, which resolved the issue.

VBS differential monitoring revealed no screens out of criteria and none were cleaned. VBS rehabilitations continued with new mesh being installed on torn VBS sections.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: Forty-two orifices were in use. The orifices were closed from approximately 0730 to 1007 hours on November 29 for the switch from primary to emergency bypass. The orifices will remain open until ESBSs are raised. Moisture continued to be bled from the orifice air supply line. One minor lubricating oil leak and three air leaks were repaired on orifice actuators on November 30.

All other dewatering and cleaning systems operated satisfactory in automatic mode except the side screen cleaning brush as outlined in Table 1 below. The brush would stall at times at two locations when traveling upstream and occasionally tripped an overload limit breaker. The roving operator would reset the limit breaker and park the brush. The high/low water alarm is on the same electrical circuit as the side brush alarm. The channel had to be monitored on graveyard shift night when the brush was off. Otherwise, the brush was left on to insure the water alarm was available. The brush cycle was set for every eight hours to reduce the number of brush alarms, yet allow for screen cleaning when staff was available to monitor.

Over the Thanksgiving weekend, the brush stalled 6 times out of 11 cycles. The brush was reset each time and monitoring continued. When the brush stalled but completed the cycle, it would "pop" over the stall point and the walkway grating would vibrate. On November 28, the last attempt to fix any above water issues that could be reached was unsuccessful. At about 1100 hours, facility staff determined that the channel would have to be dewatered to permit a closer brush examination.

Following the switch to emergency bypass on November 29, the side screen was somewhat obstructed with debris. The screen should not have been this dirty and it appears the brush was not making full contact with the screen. It is probably fortunate that the switch to emergency bypass occurred before the situation became worse.

On November 30, the mechanic found the below the water line guide rail had two joints (of three total), which required repair. One joint had a gap approximately ½ inch in length due to metal erosion. The other faulty joint appeared to be misaligned from side to side and from top to bottom by approximately ¼ inch. This second joint might have caused some of the stalling experienced in previous years. Rail repairs will require the orifices to be closed and the six inches of standing water remaining in the side brush area to be pumped out.

Table 1. Side Screen Brush Issues.

Date	Time	Issue	Result
Nov 24	0200 hours.	Side brush alarm.	Operator reset.
Nov 25	0042 hours.	Side brush alarm.	Operator reset.
Nov 25	1630 hours.	Side brush alarm.	Operator reset.
Nov 26	0050 hours.	Side brush alarm.	Operator reset.
Nov 27	0030 to 0830 hours.	Brush off.	Monitor channel hourly.
Nov 27	0830 hours.	Brush stalled.	Biologist manually switched controls to complete cycle.
Nov 27	1630 hours.	Brush stalled.	Biologist manually switched controls to complete cycle.
Nov 28	0030 to 0830 hours.	Brush off.	Monitor channel hourly.
Nov 28	0715 hours.	Brush stalled 3 times in 2 cycles.	Brush completed cycles but "popped" past stall point.
Nov 28	0830 hours.	Side brush alarm.	Mechanics examined. Biologist reset.
Nov 28	About 1030 hours.	Side brush continued to stall and alarm.	After drive chain was adjusted.
Nov 28	1630 hours.	None.	Brush ran successfully.
Nov 29	0015 hours.	Possible alarm.	Brush turned off and on to reset brush cycle timer.
Nov 29	About 0700 hours.	None.	Brush ran successfully and removed form service.

This winter, the side brush will require a replacement or a rebuild of all moving components to insure proper functioning.

Issues with the two side valves which drain water passing through the side screen also contributed to the discussion to switch to emergency bypass. The north side valve has been occasionally "popping", which could be felt in the walkway grating, when the valve stem travel reached 33 to 37 inches open. The south side dewatering valve has been occasionally jamming when the valve stem travel reached 20 to 25 inches open.

Following the change to emergency bypass, all dewatering structure systems were removed from service, the affected section of the channel was winterized and winter maintenance was initiated. Emergency bypass does not allow for PIT tag detection as fish pass through the emergency bypass slots and channel to the north ice and trash sluice way, exiting into the river.

Approximately 25 adult fall Chinook and steelhead (total number of adult fish) were observed when switching to emergency bypass. This is about ½ to ¼ less than the number of adult fish seen during similar evacuations in previous years. No smolts were observed, which is unusual. No lamprey were observed. Other non-salmonids observed included one walleye, several small mouth bass, a couple of channel catfish, two sturgeon (about 4 feet long along) and several

juvenile shad. The only mortalities noted were a couple of juvenile shad. The fish were crowded upstream of the emergency bulkhead slot in about 2.5 feet of water so an accurate count was not possible. Once the channel refilled, fish were able to exit to the river via the four emergency bypass slots in the floor of the channel upstream of the bulkheads.

Bypass Facility: Facility winterization was completed on November 29 and maintenance is now in progress.

River Conditions

River conditions during the week are outlined in Table 2 below as provided by the McNary control room. The data period runs from 0000 to 2400 hours each day. Flows and spill are recorded in one-thousand cubic feet per second (kcfs). Temperature is recorded in degrees Fahrenheit. Scheduled spillway hoist maintenance continued.

Table 2. River Conditions at McNary Dam.

Daily Average River Flow		Daily Average Spill		Water Temperature		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
141.0	123.8	0.0	0.0	52.0	50.0	6.0	6.0

Other

Inline Cooling Water Strainers: Cooling water strainer examinations will occur on December 6.

Invasive Species: Mussel station examinations will occur in late December. No mussels were observed in the dewatered juvenile collection channel, in the juvenile fish facility or in the Washington shore ladder.

Avian Activity: Casual avian observations were performed during other inspections. A gull flock appears to be roosting at various locations near the project. Over 100 gulls were observed. A kingfisher and a loon were also observed.

Cormorant numbers in the tailwater area have decreased. Gulls and cormorants were roosting on the navigation lock wing wall and other structures. They appeared to be feeding on juvenile shad in the powerhouse flow or at the juvenile bypass outfall on occasion.

In the forebay area, grebes and gulls were noted at times. Gulls were also roosting on the rocks by the Washington shore boat dock.

Research: No on-site research is occurring at this time.

Project: Ice Harbor
Biologists: Ken Fone
Dates: November 25 – December 1, 2016

Turbine Operation

Unit 5 was taken out of service on March 14 at 1117 hours, due to an oil leak from the blade packing. The packing was replaced and the blades will be welded in place to fix the leak. Unit 2 was taken out of service on April 25 at 0606 hours for runner replacement.

Available units were operated within the 1% peak efficiency range (soft constraint), except for unit 3. Unit 3 was routinely operated a few megawatts below the 1% peak efficiency range during this reporting period, due to the GDACS (Generic Data Acquisitions and Control System) needing to be updated with the narrower peak efficiency range of unit 3 since it became a fixed-blade unit.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on November 28, 29, and 30.

Upper Fish Ladders: The north fish ladder inspection areas (head differentials at the fishway exit and picketed leads, and depth over the weirs) were in criteria on all inspections. The south fish ladder inspection areas (head differentials at the fishway exit and picketed leads, and depth over the 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. The water surface above the fish ladder exits were clear of debris and the bubblers were operating satisfactorily. The picketed leads are raised out of the water as the fish counting season has ended.

Fishway Entrances and Collection Channel: The south shore entrance (SFE-1) depth and channel/tailwater head differential were in criteria on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater head differential were in criteria, except for a depth of 7.9' on November 28. The north shore entrance (NSE-1) depth and channel/tailwater head differential were in criteria, except for a depth of 7.8' on November 28. These out of criteria readings were reported to the operator, and were either due to calibration issues and/or the entrance gates being slightly off of sill in automatic control. Fishway entrance criteria are 8 feet depth or greater, or on sill. Channel/tailwater differential criteria are 1 – 2 feet.

The south shore channel velocity was in criteria. The channel velocity criterion is 1.5-4.0 feet per second.

Auxiliary Water Supply (AWS) System: Two the of three north shore AWS pumps were in operation during the week. Five of the eight south shore AWS pumps were in operation.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 4 square yards of debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 3%. Slot 2C was unwatered on July 6 to facilitate the unit 2 head gate sill plate repair.

STSs/VBSs: The STSs are in cycle-run mode. The STS for slot 5B remains uninstalled to facilitate the work on unit 5. Unit 2 STSs are raised and stored in their gatewell slots, since unit 2 will not be operated for the rest of the year. Units 1, 3, 4, and 6 STSs were last inspected on November 15 and 16, with no problems found. STSs will be removed for the season after December 15.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass operated with 20 opened orifices. Orifices were routinely cycled and back-flushed once per day.

Juvenile Fish Facility: The juvenile fish facility is operating in bypass mode.

Fish Sampling: Sampling is done for the year.

Removable Spillway Weir (RSW): Spill for fish passage and operation of the RSW are done for the year.

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
24.9	17.6	0.0	0.0	52	51	7.8	7.6

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainers with high pressure differentials due to accumulations of dead shad were cleaned on November 2, 3, 8, 11, 14, 15, 16, 17, 19, 21, 22, 25, 27, 29. A total of approximately 22,415 juvenile shad (all mortalities) were found during the month of November.

Invasive Species: No new exotic species have been found.

Avian Activity: There were high numbers of grebes, pelicans, cormorants, gulls, and mergansers observed around the project. Many of the birds were resting on the south shore of the tailrace

across from the coffer cells, and on Eagle Island. Moderate numbers of gulls and cormorants were observed foraging in the tailrace downstream of the bypass pipe outfall. High numbers of gulls were foraging downstream of the powerhouse, presumably feeding on dead juvenile shad that were removed from the cooling water strainers and disposed of into the tailrace.

Research: No on-site research is actively occurring at this time.

Project: Lower Monumental
Biologists: Bill Spurgeon, Chuck Barnes and Raymond Addis
Dates: November 25 – December 1, 2016

Turbine Operation

Unit 1 was removed from service on December 10, 2014 for u7nit rehabilitation with an estimated return to service date of March 28, 2017. Unit 6 was removed from service November 7, 2016 for routine maintenance and is scheduled to return to service on December 8, 2016. Unit 5 was removed from service from 1000 to 1400 hours on December 1 for debris removal.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on November 28, 29 and December 1.

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, readings were 6.9, 6.9 and 6.7 feet. South powerhouse channel/tailwater head met criteria (1'-2') on all inspections.

SSE1 weir gate was in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, readings were 7.9, 7.4 and 7.4 feet.

SSE2 was in criteria (6' above sill) on all inspections.

South shore channel/tailwater head was in criteria (1'-2') on all inspections with the exception of November 28 with a reading of 0.5 feet. The powerhouse operator found a tripped breaker in the SSE system. The breaker was reset by a powerhouse electrician and the readings returned to criteria.

Auxiliary Water Supply System: AWS pumps 2 and 3 were operated throughout this period. Pump 1 was out of service throughout this period due to a bushing problem. This pump will be replaced with the spare pump as time permits.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 3 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 20% surface coverage. No oil problems were observed in the gatewells.

STSs/VBSs: STSs were operated in cycle-run mode throughout this report period. STS inspections were conducted November 1 and 2 with all screens found in good operating condition.

Orifices, Collection Channel, Dewatering Structure, and Flume: The collection channel was operated with 18 opened orifices.

Collection Facility: The facility was dewatered for winter maintenance on October 1.

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

River Conditions

Summer spill operations in support of fish passage ended at 2400 hours on August 31. 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
27.6	17.5	0.0	0.0	50.0	49.0	5.0	4.2

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on November 1. No live fish were recovered. Mortalities included 3 juvenile lamprey, 1 Siberian prawn and 650 juvenile American shad.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on November 2.

Avian Activity: Daily tailrace counts of feeding piscivorous birds are summarized in Table 2 below. Daily tailrace counts ceased at end of collection season on September 30. No action trigger points from the avian action plan occurred during this report period.

Table 2. Tailrace counts of foraging piscivorous birds at Lower Monumental Dam.

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
November 25	---	---	---	---	---	---
November 26	---	---	---	---	---	---
November 27	---	---	---	---	---	---
November 28	---	---	---	---	---	---
November 29	---	---	---	---	---	---
November 30	---	---	---	---	---	---
December 1	---	---	---	---	---	---

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

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: November 25 – December 1, 2016

Turbine Operation

All turbine units were available for service except units 1 and 2. Unit 2 was placed out of service for an annual inspection on November 07. Unit 2 was returned to service for a short period of time on November 23, but was forced out of service due to an oil leak in the Kaplin head. Following repairs, unit 2 was again returned to service on November 28. Unit 1 was placed out of service on November 21 for an annual inspection. No 1% violations to report.

Adult Fish Passage Facility

The Fishway control system software was updated by RJS construction and returned to automatic operation on August 9. All weirs were manually adjusted and returned to automatic mode to determine functionality of the new software. The system was not operating sufficiently and was returned to manual mode on September 19. Future calibration and maintenance still need to be performed.

Adult fishway inspections were performed on November 28, 29 and 30.

Fish Ladder: The ladder exit head differentials and water depth at Diffuser 13 maintained criteria ($\leq$ 0.5 ft. and 1.1-1.2 ft., respectively) and picketed lead differentials ranged between 0 and 0.1 feet (criteria $\leq$ 0.3 ft.). The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily.

Fishway Entrances and Collection Channel: SSE1 and SSE2 weir gates met depth criteria (criteria $\geq$ 8.0 ft. or on sill) on all inspections and ranged between 9.0 and 9.6 feet. South shore channel/tailwater head differential met criteria (criteria 1.0-2.0 ft.) on all inspections.

NPE1 and NPE2 weir gates were in criteria on all inspections. Weir depths ranged between 7.0 and 7.8 feet (criteria $\geq$7.0 ft. or on sill). North powerhouse channel/tailwater head differential met criteria (criteria 1.0-2.0 ft.) on all inspections.

NSE1 and NSE2 weir gate depths were in criteria on all inspections and ranged between 6.5 to 7.2 feet (criteria $\geq$ 6.0 ft or on sill.) and were within depth criteria on all inspections. North shore channel/tailwater head differential met criteria (criteria 1.0-2.0 ft.) on all inspections.

Collection Channel Velocity: The average surface water velocity measurements were in criteria on all inspections and ranged between 1.8 and 2.6 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: The fish ladder is now operating on three pumps. The average water velocity (bottom, middle, top) of the adult channel at NPE was 3.1 fps on November 07.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: The trash/shear boom is currently still on shore. Efforts are underway to have it repaired. Woody debris accumulations in the immediate forebay ranged from 150 to 450 square feet.

Spillway Weir: The TSW was removed on July 11.

ESBS/VBS: Electrical ESBS brush tests were performed on November 08. All test results were satisfactory.

Orifices, Collection Channel, Dewatering Structure, and Flume: The weirs at the primary dewaterer were returned to automatic mode on October 26. The juvenile bypass system is presently running with 18 opened orifices. Orifices are cycled every 24 hours.

Collection Facility: Winter maintenance is underway.

Transport Summary: The collection and transportation facility was unwatered without any problems on November 03.

River Conditions

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

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
25.6	15.6	0.0	0.0	49.5	49.0	6.0	6.0

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers on all units were inspected November 21. No lamprey or salmonid species were seen.

Invasive Species: The zebra mussel substrate monitor was inspected on November 3. No mussels were seen.

Avian Activity: USDA Bird hazing ended on June 25. See Table 2 below for USACE counts.

Table 2. Daily Avian Counts at Little Goose Dam, November 25 – December 1, 2016.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
November 25	None	---	---	---	---
November 26	None	---	---	---	---
November 27	None	---	---	---	---
November 28	None	---	---	---	---
November 29	1300	14	8	0	0
November 30	0930	11	4	0	0
December 1	None	---	---	---	---

*Bird counts are taken from a single observation, Forebay and Tailrace.

Siberian Prawn: Siberian prawns are no longer being counted as fish collection ended October 31.

Gas Bubble Trauma: GBT inspections ended for the season with the July 19 report. No signs of GBT were seen this season.

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

Project: Lower Granite
Biologists: Elizabeth Holdren and Robert Horal
Dates: November 25 – December 1, 2016

Turbine Operation

Units are being operated within the soft constraint 1% peak efficiency criteria. Unit 1 remains out of service for Kaplan blade linkage repair. Unit 2 was removed from service at 0605 hours on November 28 for an unit annual.

Adult Fish Passage Facility

Adult fish facilities were inspected by Corps Biologists November 28, 29, 30 and December 1.

Fish Ladder: Fish ladder exit head differentials and depths over the weirs met criteria (≤0.5' and 1.0-1.3', respectively) on all inspections. Picketed lead head differentials also met criteria (≤ 0.3'). NSE elevation readings were taken from the ladder control system digital display November 28, 29, and 30 due to the North elevator being out of service. An average of about 9.0 square yards of debris was observed near the ladder exit.

Fish Ladder Entrances and Collection Channel: SSE1 and SSE2 weir gates met depth criteria (criteria ≥8' or on sill) on all inspections. South shore channel/tailwater head differentials also met criteria (criteria 1'-2') on all inspections.

NPE1 and NPE2 weir gates were in depth or sill criteria (criteria ≥8' or on sill) on all inspections. NPE1 and NPE2 were in depth criteria while on sill November 30. North powerhouse channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections.

NSE1 was in criteria (criteria ≥7' or on sill) on all inspections. NSE2 has been out of service since 2011 and remains set with a chain fall hoist in the closed position. The North shore channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections.

Collection Channel Velocity: The average collection channel average velocity was in criteria (criteria 1.5-4.0 fps) on all inspections.

Auxiliary Water Supply System: The fish ladder is in two pump operation with AWS pumps 1 and 3 in service. Pump 2 is in standby mode.

Fish Ladder Temperature Control System: This system is not in service at this time.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: An average of about 125.0 square yards of debris was observed in the forebay this week.

ESBSs/VBSs: ESBSs are removed for winter maintenance.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The collection channel is dewatered for winter maintenance.

Collection Facility: The facility is currently in winter maintenance mode.

Transport Summary: No fish transport is occurring at this time.

River Conditions

No spill has occurred this week. River conditions during the week are outlined in Table 1 below.

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	17.4	0.0	0.0	47.0	46.0	5.0	3.8

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: No inspections occurred this week.

Invasive Species: Zebra/quagga mussel substrate was inspected November 14. No zebra/quagga mussels were found.

Avian Activity: Seasonal bird counts ended October 31.

GBT: Gas Bubble Trauma examinations have ended for the season.

Adult Fish Trap Operations: The adult trap is unwatered for winter maintenance.

Fish Rescue Operation: No rescue operations occurred this week.

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