U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#39-2015

Project: McNary
Biologist: Bobby Johnson
Dates: November 20 – 26, 2015

Turbine Operation

McNary had available 10 to 13 units (out of 14 total units) for power generation this week. On November 1, the soft 1 percent constraint began. Turbine unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
14	Oct 5–Nov 30	About 56 days.	9 year overhaul.
13	Nov 2–23	About 21 days.	Transmission line outage.
2 & 8	Nov 19–20	24.8 & 25.3 hours each.	High pressure oil injection system (HPOIS - thrust bearing oil pump) installed.
9 & 10	Nov 20–23	70.9 & 69.1 hours each.	HPOIS installed.
10	Nov 24–Dec 3	About 9 days.	Brake issue and inspection.

Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on November 22, 23 and 25. At the Oregon ladder entrances, visual inspections were performed on November 20 and 21.

On the November 20, at 1530 hours, while trying to isolate a direct current (DC) ground issue, both fish pumps 1 and 3 tripped off line due to over excitation. At 1605 hours, fish pump 3 returned to service with a blade angle of 30 degrees.

At fish pump 1, the 86 relay, a generic term for any lock out device, would not allow the pump to restart. The electricians and operators tried to isolate the problem. They tried to determine if relay failure caused the lock out during the ground search or if something "upstream" of the relay was causing the problem, which in that case, the relay was functioning properly.

At 1655 hours, the ladder was set according to Fish Passage Plan (FPP) page MCN-23, 3.2.2.3.d, for one fish pump operation. On November 20 and 21 (per control room printout), the north pool differential was at 1.8 feet (criteria is 1.0 to 2.0 feet), the south pool differential was at 1.1 feet,

NFEW2 was at 7.7 to 7.8 feet depth (criteria is 8.0+ feet), NFEW3 was raised and SFEW1 along with SFEW2 was at 6.3 to 6.5 feet.

On November 21, SFEW1 and SFEW2 were inadvertently switched to manual mode. The operators adjusted the weirs three times manually with tailwater elevation changes until the next day when the night shift confirmed there was no reason for the weirs to be in manual mode. On November 22, they were switched to automatic mode.

On November 23, at 1320 hours, fish pump 1 was returned to service. Ladder adjustments soon followed. At about 1515 hours, the operators lowered the two south entrances. The ladder was in criteria with two fish pumps operational. Both pumps had blade angles of 25 degrees.

At fish pump 1, the 86 relay required a coil to be replaced. The field current breaker (41) was replaced. Exciter shunt fuses were replaced and electrical connections improved. These connections will be check at fish pump 3 when the opportunity arises.

The reason the fish pump 1 would not restart was the 41 breaker had three contacts fused closed. Two of three contacts are configured "Normally Open" and provide the stator coil excitation to operate the motor and one set of contacts is configured for "Normally Closed" and is used to shunt the collapsing stator field when shutting off the fish pump. The breaker coil must have failed and dropped the breaker closed with excitation voltages still being applied. With all three contacts in the closed position, the voltage used to start the fish pump was being directly shunted through the third contact to the shunt resistors, which caused an over current condition and was "tripping" the FP offline before it could restart. It is believed when fish pump 1 was shutdown, the 41 breaker failed in the closed position and the collapsing field current plus the excitation voltage ended up flowing to the shunt resistors, which fused all three contacts.

Fish Ladder Exits: Criteria at both exits are 1.0 to 1.3 feet for head over weir and 0.0 to 0.5 feet differential at the count stations. Both ladder exits met all criteria and debris loads were minimal.

On November 23, the operators reset a low water alarm at the Washington exit. On November 25, the tilting weir set point was adjusted.

On November 22 and 25, at the Oregon ladder exit, the tilting weir and regulating weir set points were adjusted, respectively.

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 were in criteria.

At the Oregon ladder, for non-measured readings, refer to the Adult Fish Passage Facilities section opening above. On November 23, the measured inspection occurred before fish pump 1 returned to service. Both pool differentials remained in criteria. On November 22, north powerhouse entrance, NFEW2 measured a depth of 7.9 feet. From November 20 to 23, NFEW 3

was raised above tailwater as stated above. At the south powerhouse entrance, on November 22 and 23, SFEW1 and SFEW2 measured depths ranging from 5.6 to 5.8 feet. On November 25, SFEW1 and SFEW2 measured depths of 7.8 and 7.9 feet, respectively. It appears the tailwater sensor requires calibration.

Collection channel surface velocities averaged 1.6 feet per second.

Auxiliary Water Supply System: The PUD turbine unit in the Washington ladder remains out of service for runner replacement, which is scheduled for completion in February, 2016. The bypass functioned satisfactorily.

Two of the three Oregon ladder fish pumps operated satisfactorily with blade angles of 25 degrees with the one interruption in service discussed above. Fish pump 2 is currently under contract for major overhaul with completion scheduled for April, 2016.

The juvenile facility continued to supply 450 cubic feet per second to the north powerhouse pool.

Juvenile Fish Passage Facility

The fall primary bypass season continues. The juvenile facility remains watered up to avoid freeze breakage.

Forebay Debris/Gatewell Debris/Oil: The forebay debris load was light to minimal. The amount of new debris was minimal.

No high trash rack differentials were recorded and no trash racks were cleaned.

No problems were observed in the gatewell slots.

Extended-length submersible bar screen (ESBSs)/Vertical Barrier Screens (VBSs): All turbine units have ESBSs installed. The screens in slots 1A, 3B, 11C and 12C remained in timer mode. No camera inspections occurred this week.

Two high VBS differentials were recorded (unit loads were 67 and 72 megawatts). On November 20 and 21, these screens and four others were cleaned. No fish mortalities were observed. VBS rehabilitations continued.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: Forty two orifices were in use. During VBS cleaning, orifices in the affected slots were closed, with makeup water coming from orifices in adjacent slots. Scheduled maintenance continued on the orifice actuators this week. Lighting was replaced as required. All systems functioned satisfactorily in automatic mode.

Bypass Facility: During the fall primary bypass season, passive integrated transponder (PIT) tag detection occurs only in the full flow pipe. Light maintenance continued.

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. Temperatures are recorded in degrees Fahrenheit.

Table 2. River Conditions at McNary Dam.

Daily Average River Flow		Daily Average Spill		Water Temperature (Unit 1 scroll case)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
142.0	110.6	0.0	0.0	52.0	48.0	6.0	5.5

Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur on December 1.

Invasive Species: On November 22, the zebra mussel station examinations revealed no problems.

Avian Activity: In the forebay observation zone, grebes and gulls were occasionally were noted. Gulls and cormorants were roosting on the rocks by the Washington shore boat dock, which is outside the forebay observation zone.

Gulls and cormorants were observed in the tailwater observation area, roosting on the navigation lock wing wall, in the spill basin or around the powerhouse. They appear to be feeding in the powerhouse flow on juvenile shad.

Gulls and cormorants were observed occasionally feeding near the juvenile bypass outfall.

A large gull flock continued to move around in the general area. An occasional blue heron, night heron or loon was noted on project.

Research: There is no on site research in progress at this time.

Project: Ice Harbor
Biologist: Ken Fone
Dates: November 20 – 26, 2015

Turbine Operation

Unit 1 was removed from service on November 2 at 0417 hours for annual maintenance. Units 4 and 6 were periodically operated slightly below the 1% peak efficiency range (soft constraint), due to BPA load requirements and the narrow 1% range of unit 2 (fixed-blade unit).

Adult Fish Passage Facility

Fish facility personnel inspected the adult fishways on November 23, 24, and 25.

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. The water surfaces above the fish ladder exits were clear of debris and the bubblers were operating satisfactorily. The south shore and north shore picketed leads are raised since adult fish counting is done for the season.

Fishway Entrances and Collection Channel: The south shore entrance (SFE-1) depth and channel/tailwater differential were in criteria on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater differential were in criteria on all inspections. The north shore entrance (NSE-1) depth and channel/tailwater differential were in criteria. 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 on all inspections. The channel velocity criterion is 1.5-4.0 feet/second.

Auxiliary Water Supply (AWS) System: Two of the three north shore AWS pumps were operated throughout the week. Six of the eight south shore AWS pumps were operated throughout the week.

Juvenile Fish Passage Facility

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

STSs/VBSs: The STSs are being operated in cycle-run mode. Inspections of the STSs for unit 2 through unit 5 occurred on November 16 and 18. Overall, there were a few screen clips missing from the seams, but no significant problems were observed. Unit 1 STSs were removed on November 4, since this unit will remain out of service through December 15.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass system is operating with 20 orifices open. Orifices were routinely cycled and back-flushed once per day. On November 23, the mechanical screen cleaner was found to be stuck midway down the channel with the brush up. A metal tray was jammed between the brush and the wall, preventing the screen cleaner from moving. Personnel freed the screen cleaner, but the tray fell into the water. Personnel probed the bottom of the channel for the tray, but believe the current pushed the tray through the bypass pipe and out into the river. These trays are mounted along the forebay-side of the wall along the top of the dam and will hold cables for future fish research. Five other trays are missing from the wall, two of which may also have fallen into the juvenile fish channel at some point during the season. Each tray is made of metal lattice-work, measuring approximately 6 feet long, by 5 inches wide, by 2 inches high. Personnel will continue monitoring the flume sections of the bypass pipe for any indications of obstructions in the water.

Juvenile Fish Facility: Fish are being routed through the bypass pipe.

Fish Sampling: Fish sampling is done for the season.

Removable Spillway Weir (RSW): Mandated spill for fish passage began on April 3 and ended on August 31.

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
22.4	14.5	0	0	56	52	7.0	7.0

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: The cooling water strainers for unit 2 through unit 5 were inspected on November 16 and 18. There was a total of approximately 180 juvenile shad found (all mortalities).

Invasive Species: No new exotic species have been found.

Avian Activity: A relatively high number of cormorants, gulls, and pelicans were seen around the dam during the week, with the majority of birds roosting on or near Eagle Island. Approximately 10-20 cormorants were observed foraging below the end of the juvenile fish bypass pipe during the week. Fish facility personnel periodically used a laser light to scare the cormorants away from the outfall pipe and Eagle Island, and move them further downstream. Generally, efforts were successful when done under overcast skies near dawn or dusk.

Research: There is no on-site fish research actively occurring at this time.

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: November 20 – 26, 2015

Turbine Operation

The units are being operated within the soft constraint 1% peak efficiency criteria. Unit 1 was removed from service on December 10, 2014 for unit rehabilitation with an estimated return to service date of January 12, 2017. Unit 2 was removed from service at 0800 on November 9 for annual maintenance with an estimated returned to service on January 14, 2016.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on November 23 and 24.

Fish Ladders: Fishway exit head differentials and depth 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, both gate depth readings ranged from 6.5 to 7.2 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in depth or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth reading was 7.9 feet. SSE2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head was in criteria (1'-2') on all inspections.

Auxiliary Water Supply System: AWS pumps 1, 2, and 3 were operated throughout this period.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 15 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 15% surface coverage. No problems were observed in the gatewells.

STSs/VBSs: STS operation changed to cycle mode on August 7 as average sub-yearling Chinook length became greater than 120 mm. STS inspections were conducted November 3 and 4 with all screens found in good operating condition.

Orifices, Collection Channel, Dewatering Structure and Flume: The collection channel was operated with 19 orifices open. Primary dewatering structure (PDW) over head lights are turned off to encourage fish to exit the collection channel.

Collection Facility: The collection season ended at 0700 hours on October 1 at which time the facility went into primary bypass. The JFF (Juvenile Fish Facility) was dewatered for winter maintenance on October 6.

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

River Conditions

No spill occurred during this report period. 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
20.7	13.5	0.0	0.0	55	53	4.4	4.3

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on November 2. Live fish recovered included 1 yellow perch. Mortalities included 50 Siberian prawns and 74 American shad.

Invasive Species: No zebra mussels were observed at the monitoring stations on November 2.

Avian Activity: Daily tailrace counts ceased at the end of the collection season on October 1. The bird sprinklers at the outfall pipe exit are dewatered for the winter.

Table 2. Lower Monumental Tailrace Counts of Foraging Piscivorous Birds.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
N/A					

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

Project: Little Goose
Biologist: Richard Weis
Dates: November 20 – 26, 2015

Turbine Operation

All turbine units were available for service throughout this report period except units 3 and 6. Unit 3 was out of service for XJ breaker failure. Unit 6 was removed from service for digital governor replacement on November 2. Soft constraint 1% peak efficiency criteria went into effect as of November 1.

Adult Fish Passage Facility

Adult fishway inspections were performed on November 24 and 26.

Fish Ladder: The ladder exit head differentials held steady at 0.1 feet (criteria ≤ 0.5 ft.). Water depths over the ladder weirs ranged between held 1.2 and 1.3 feet (criteria 1.0-1.3 ft.) and picketed lead head differentials held steady at 0.1 feet (criteria ≤ 0.3 ft.). The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily.

Fishway Entrances and Collection Channel: The adult fishway system is mostly in manual mode. North shore adult fish entrance weirs are on manual due to failure of the slack cable sensors. North power house weirs are also on manual mode as the fishway computer was bringing the weirs "off sill" and out of criteria. Channel to tailwater head differentials ranged between 1.1 and 1.5 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.5 and 8.8 feet (criteria ≥ 8.0 ft). NPE weir depths ranged between 6.3 and 6.4 feet and was on sill (criteria ≥7.0 ft. or on sill). NSE weir depths ranged between 6.7 and 7.7 feet (criteria ≥ 6.0 ft.). Collection channel surface water velocity measured at the North powerhouse ranged between 1.7 and 1.8 fps (criteria 1.5 to 4.0 fps). The monthly water velocity measured at the north powerhouse using the Rickly velocity equipment measured 1 foot from bottom, mid depth and surface averaged 3.5fps.

Auxiliary Water Supply System: Fish pumps 2 and 3 operated as designed. The fish pump 1 gear box was rebuilt and is still waiting on return to service.

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 in the immediate forebay held steady at 0 square feet for the week.

Spillway Weir: Spillway weir was removed for the season on June 18.

ESBS/VBS: ESBS screens are all deployed and gatewells are clean. Drawdowns were performed on unit 1 on November 24. All tests met criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume: The Juvenile Bypass System (JBS) is running with 18 open orifices.

Transportation Facility: The JFF (Juvenile Fish Facility) collection season ended with the last truck departing on October 31. GBT (Gas Bubble Trauma) sampling ended for the season.

Transport Summary: The collection and transportation facility was placed into primary by-pass on October 31 at 0700 hours.

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
21.3	13.7	0	0	51.1	50.3	6.0+	6.0+

*Ladder temperature.

Other

Inline Cooling Water Strainers: All cooling water strainers were last checked on October 24. No fish were seen.

Invasive Species: The zebra mussel substrate monitor was inspected on October 10. No zebra mussels were detected.

Avian Activity: Bird hazing ended on June 16. See chart below for the numbers observed.

Table 2. Daily maximum tailrace piscivorous bird counts at Little Goose Dam*.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
Nov 20	None	0	0	0	0
Nov 21	None	0	0	0	0
Nov 22	None	0	0	0	0
Nov 23	0845	115	7	0	0
Nov 24	0900	83	25	0	0
Nov 25	0840	155	37	0	0
Nov 26	None	0	0	0	0

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

Scroll Case Temperature: Little Goose Dam has only one temperature probe on the unit 1 scroll case. Temperature readings ranged between 50.0 and 51.0 F.

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

Project: Lower Granite
Biologists: Elizabeth Holdren, Robert (JR) Horal
Dates: November 20 – 26, 2015

Turbine Operation

All available turbine units are operating within the soft constraint 1% peak efficiency criteria. Unit 2 was removed from service for annual maintenance at 0705 hours on November 9.

Adult Fish Passage Facility

The adult fish ladder was inspected by Corps biologists on November 24 and 25.

Fish Ladder: Fish ladder exit head differential and depth over the weirs were in criteria (≤0.5' and 1.0-1.3', respectively). Picketed lead head differential was in criteria (≤ 0.3').

Fishway Entrances and Collection Channel: SSE1 and SSE2 weir gates were in depth criteria (criteria ≥8' or on sill). South shore channel/tailwater head differential was in criteria (criteria 1'-2').

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

NSE1 was out of criteria (criteria ≥7' or on sill) on all inspections with a gate depth reading of 5.0' and 4.8 feet. NSE2 remains set with a chain fall hoist in the closed position to improve channel/tailwater head differentials. North shore channel/tailwater head differential was in criteria (criteria 1'-2') on all inspection.

Collection channel velocity was out of criteria (criteria 1.5-4.0 fps) with readings ranging from 0.9 – 0.8 fps and an average of 0.8 fps. Alternative methods of measuring collection channel velocity are being investigated.

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

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Forebay debris was minimal. Daily gatewell surfaces inspections continue. Floating debris is being removed daily to prevent orifice blockages. No oil was reported in gatewell slots.

ESBSs/VBSs: ESBSs are installed and operating.

Orifices, Collection Channel, Dewatering Structure and Bypass Pipe: Orifices are being backflushed every three hours as needed.

Collection Facility: Facility operation is in secondary bypass mode.

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

River Conditions

No spill 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
21.3	15.3	0.0	0.0	51	50	5.0+	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers were inspected November 25. No lamprey or other fish were found.

Invasive Species: No evidence of zebra/quagga mussel was observed November 3.

Adult Fish Trap Operations: The adult trap was removed from service and winterized on November 23.

Fish Rescue Operation: No fish rescues occurred this week.

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