U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#42-2015

Project: McNary
Biologist: Bobby Johnson
Dates: December 11 - 17, 2015

Turbine Operation

McNary had available 12 to 14 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–Dec 16	About 72 days.	9 year overhaul.
10	Dec 8–11	2.9 days.	High pressure oil injection system (HPOIS - thrust bearing oil pump) repaired.
3	Dec 11	1.0 hours.	Slough debris off vertical barrier screen (VBS).
10, 11, 12 & 13	Dec 16	24.9 hours total.	Extended-length submersible bar screens (ESBSs) raised for winter maintenance.
6, 7, 8 & 9	Dec 17	22.2 hours total.	ESBSs raised for winter maintenance.

Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on December 13, 15 and 16.

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 except on December 16, when the Washington ladder head over weir measured 0.9 feet. The mechanics are installing new handrail around the exit weirs over a two week period. When working by a specific weir, the mechanics switch the weir to manual operation for safety reasons. The operators adjust the exit as required for forebay elevation changes. This low reading occurred before the exit was adjusted.

At the Washington exit, on December 11, the exit trash rack was found raised. With the picketed leads raised and only a light amount of milfoil in the area, impacts were negligible.

Debris loads were minimal at both exits.

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 greater. Both ladders inspection points were in criteria. On December 14, the electrical staff continued upgrades on Oregon entrance NFEW1.

Collection channel surface velocities averaged 1.7 feet per second.

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 has been delayed to an undetermined date. The winter maintenance outage will be unaffected. The bypass functioned satisfactorily.

Two of the three Oregon ladder fish pumps operated satisfactorily with blade angles of 25 degrees and no interruptions in service. 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 until December 16, when the juvenile system was switched from primary to emergency bypass mode.

Juvenile Fish Passage Facility

The fall bypass season continues. On December 16, the system was switched from primary to emergency bypass as ESBS removals began. Juvenile channel unwatering is scheduled for December 22.

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.

ESBS/VBS: Except for unit 14, ESBSs remained deployed in all units until the start of emergency bypass operations on December 16. Unit 14 fish screens were already removed as this unit was out of service until December 16. Screens were raised for winter maintenance for units 6 through 13 on December 16 and 17. The remaining ESBSs will be raised on December 18 and 19. The screens in slots 1A, 3B, 11C and 12C remained in timer mode until the screens were raised.

One high VBS differential was recorded. On December 11, the differential in slot 3A measured 1.7 feet with the unit at 77 megawatts (MW). This unit was removed from service for one hour. With unit 3 at 63 MW, the differential measured 1.1 feet. The next day, the differential

measured 1.6 feet with unit 3 at 70 MW. This screen and four others were cleaned. Only juvenile shad 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. Occasionally, a small amount of moisture was bled from the orifice air supply line.

On December 14, district personnel examined the emergency bypass bulkheads. Sometime between 1330 and 1420 hours, one of two emergency stop buttons was inadvertently pushed. This resulted in two alarms, one for the emergency stop and one for the rectangular screen cleaning brush, which was timed to run when the emergency stop occurred. By 1430 hours, the biologist reset the system. The rectangular brush cycle time was also reduced to 120 minutes.

Until December 16, all systems functioned satisfactorily in automatic mode. At 0700 hours, all systems were removed from service. From 0730 to 1115 hours, the system was switched from primary bypass to emergency bypass. Most of the channel systems were winterized and maintenance has begun.

Bypass Facility: On December 16, the system was switched to emergency bypass. Passive integrated transponder (PIT) tag detection ended for the season ended with this change. The facility was fully winterized and 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
168.4	119.9	0.0	0.0	48.0	46.0	6.0	6.0

Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur on January 5.

Invasive Species: The next zebra mussel station examinations will occur on December 20.

Avian Activity: In the forebay observation zone, cormorants and gulls were occasionally 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 walls, on the Washington ladder, 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 or emergency bypass outfalls.

A large flock of gulls continued to move around in the general area. An occasional blue heron was noted on project.

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

Project: Ice Harbor
Biologists: Ken Fone / Charlie Dennis
Dates: December 11 - 17, 2015

Turbine Operation

Unit 1 was removed from service on November 2 at 0417 hours for annual maintenance. Unit 6 was taken out of service from December 9 at 1531 hours to December 16 at 1722 hours to diagnose a possible oil leak. No oil leak was found. Units 5 and 6 were removed from service on December 16 from 0647 to 1105 hours and from 1105 to 1456 hours for STS removals. Units 4 and 3 were removed from service on December 17 at 0622 hours to 0945 and 0959 to 1338 for STS removals. Unit 6 was removed from service on December 17 from 1532 to 1629 hours from high differential caused by the buildup of juvenile shad.

Adult Fish Passage Facility

Fish facility personnel inspected the adult fishways on December 14, 15, and 17.

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. Unit 1 STSs were removed on November 4, since the unit will remain out of service through December 15. 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.

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. The hydrocannon water line and pump for deterring birds away from the bypass outfall pipe was shut off and winterized on December 8.

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
32.20	22.70	0	0	48	47	8.8	8.1

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: The cooling water strainers for units 6 and 5, and for unit 4 and 6, were inspected on December 16 and 17, respectively. Approximately 675 juvenile shad were recovered (all mortalities). The other cooling water strainers will be inspected as needed the week of December 18.

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. Up to 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. The adult fish trap was installed in the south ladder exit pool on the afternoon of December 7 so that Pacific States Marine Fisheries Commission personnel could finish wiring in PIT-tag detection capability for the trap. The work was performed in the afternoons, when generally less adult fish are using the ladder. The doors to the trapping cage were open so that fish could pass straight through the trap. The trap was removed on the afternoon of December 11.

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: December 11 - 17, 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 hours on November 9 for annual maintenance with an estimated returned to service date of January 14, 2016. Units 3, 4, 5 and 6 were rotated out of service for STS removal on December 16 and 17.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on December 14, 15, 16 and 17.

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 6.7 to 7.5 feet. South powerhouse channel/tailwater head differentials were 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 7.7 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 43 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 30% surface coverage.
No problems observed in gatewells.

STSs/VBSs: STSs were operated in cycle-run mode until removed for winter maintenance (all raised by December17th). 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 operated with 19 orifices open until unwatering on December 17 at 1315 hours.

Collection Facility: The JFF 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
32.2	23.3	0.0	0.0	47.6	44.0	6.0	4.7

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were cleaned out on December 2. Biological content is unknown as fish facility personnel were not contacted to coordinate this joint PM (periodic maintenance).

Invasive Species: No zebra mussels were observed at the monitoring stations on December 7.

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: December 11 - 17, 2015

Turbine Operation

All turbine units were available for service through most of this report period except units 1 and 4. Unit 1 was removed from service on December 07 for annual maintenance. Unit 3 was returned to service on December 11. Unit 6 was returned to service from digital governor replacement on December 11. Unit 4 was removed from service for digital governor installation on December 14. Soft constraint 1% peak efficiency criteria are in effect.

Adult Fish Passage Facility

Adult fishway inspections were performed on December 15, 16 and 17.

Fish Ladder: The ladder exit head differentials ranged between 0.0 and 0.3 feet (criteria $\leq$ 0.5 ft.). Water depths over the ladder weirs held steady at 1.2 feet (criteria 1.0-1.3 ft.) and picketed lead head differentials ranged between 0.0 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: The adult fishway system is mostly in manual mode. North shore adult fish entrance weirs are in manual mode due to failure of the slack cable sensors. North power house weirs are also on manual mode as the fishway computer is raising the weirs off from sill and out of criteria. Channel to tailwater head differentials ranged between 0.9 and 1.6 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.1 and 8.6 feet (criteria $\geq$ 8.0 ft). NPE weir depths ranged between 5.8 and 6.3 feet and remained on sill (criteria $\geq$7.0 ft. or on sill). NSE weir depths ranged between 6.3 and 6.7 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured at the North powerhouse ranged between 1.9 and 2.0 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 3.5 fps.

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 50 square feet for the week.

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

ESBS/VBS: All ESBSs remained deployed at the beginning of the week and the gatewells were clean. Drawdowns were not performed this week. ESBSs were removed from all units on December 16 and 17.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile bypass system (JBS) operated with 18 open orifices.

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

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
31.6	22.3	0	0	43.9	42.8	5.7	5.1

*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 December 3. No zebra mussels were detected.

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

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

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
Dec 11	None	0	0	0	0
Dec 12	None	0	0	0	0
Dec 13	0845	16	32	0	0
Dec 14	0843	0	0	0	0
Dec 15	None	0	0	0	0
Dec 16	None	0	0	0	0
Dec 17	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 scroll case in unit 1 only. Temperatures ranged between 58 and 59 degrees F. Since unit 1 is currently out of service for annual inspections, scroll case temperature readings may be impacted.

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

Project: Lower Granite
Biologists: Elizabeth Holdren, Robert (JR) Horal
Dates: December 11 - 17, 2015

Turbine Operation

Units are operating within the soft constraint 1% peak efficiency criteria.

Adult Fish Passage Facility

The adult fish ladder was inspected by Corps Biologists on December 14, 15, 16 and 17.

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

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

NPE1 and NPE2 weir gates were within depth criteria (criteria ≥8' or on sill) on all inspections. North powerhouse channel/tailwater head differentials met criteria (criteria 1'-2').

NSE1 was out of criteria (criteria ≥7' or on sill) on all inspections with gate depth readings of 5.0', 4.8', 5.1' and 4.6 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 out of criteria (criteria 1'-2') on two inspections with a reading of 0.9 feet December 15 and 16.

The collection channel velocity was out of criteria (criteria 1.5-4.0 fps) on all inspections with readings ranging from 0.9 – 0.8 fps and an average of 0.9 fps. Alternative methods of measuring collection channel velocity are being investigated as part of the fish ladder control system upgrade during the 2015-2016 winter maintenance outage.

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. No oil was reported in the gatewell slots.

ESBSs/VBSs: ESBSs are undergoing winter maintenance.

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

Collection Facility: The facility is in winter maintenance mode.

Transport Summary: N/A.

River Conditions

No spill is occurring at this time. 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
33.0	23.1	0.0	0.0	42.0	41.5	3.6	3.2

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers inspections are scheduled for December 21.

Invasive Species: No evidence of zebra/quagga mussel was observed December 1.

Adult Fish Trap Operations: The adult trap in winter maintenance mode.

Fish Rescue Operation: No fish rescues occurred this week.

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