U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#38-2016

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: November 11 - 17, 2016

Turbine Operation

Available turbine units operated outside the soft 1% peak efficiency criteria on November 11, 12, 14, 16 and 17 as requested by the Bonneville Power Administration. McNary turbine unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
13	Oct 3 to Dec 2	About 2 months.	Nine year over-haul.
11 & 12	Nov 9 to 23	About 14 days.	Station service contract upgrades.
5 to 7	Nov 15	1.2 hours.	Extended-length submersible bar screen (ESBS) camera inspections.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on November 12, 13 and 16.

Fish Ladder Exits: 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.

The Washington exit met all criteria during measured inspections.

The Oregon exit also met all criteria. Weir 337 tripped an encoder alarm on November 12. The electrical staff resolved the issue on November 14. 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. The entrance control panel display recorded faulty readings on October 10. The electrical staff resolved the issue on November 14.

At the Oregon ladder, north powerhouse entrances NFEW2 and NFEW3 measured 7.8 to 7.9 feet in depth on November 12 and 13. The control room operator found the weir position indicators fluctuating between 247 and 256 feet on November 12 at 0857 hours. The weirs were switched to manual mode. The electrical staff rebooted the ladder system computer on November 14, which resolved the issue. The weirs were returned to automatic mode.

The south powerhouse entrance SFEW1 measured 7.9 feet in depth on November 12 and 16. The south elevation pool sensor was noted out of calibration on November 13 and 16. The electrical staff examined the sensor on November 14 and 17. All other inspection points remained in criteria.

The Oregon ladder collection channel surface velocities averaged 1.4 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 continues to function satisfactorily.

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.

Juvenile Fish Passage Facility

The fall primary bypass season continues.

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.

ESBSs/Vertical barrier screen (VBSs): ESBSs are deployed in all units. ESBS camera inspections at units 5, 6 and slot 7A occurred on November 15. The camera cable spool failed during the inspection in slot 7A. The spool shear pin was replace the next day. The ESBSs in slots 1A, 6B, 6C, 8C, 12A and 12C remained in timer mode. The ESBS electrical cables in slot 3A were adjusted on November 11.

VBS differential monitoring revealed no screens out of criteria. Thirteen screens were cleaned on November 11. Scheduled VBS inspections occurred in units 12 through 14 on November 16.

No problems were found. 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. During VBS cleaning and inspections, orifices in the affected slots were closed, with makeup water coming from orifices in adjacent slots.

Lighting in the south end of the channel near the dewatering structure was repaired or replaced this week.

Issues with the side screen cleaning brush are outlined in Table 2 below. The brush appears to have repeatedly tripped an overload limit breaker while traveling upstream.

Table 2. Side Screen Brush Issues.

Date	Time	Issue	Result
Nov 13	1540 to 1610 hours.	Side brush alarm.	Operator reset.
Nov 14	0200 to 0237 hours.	Side brush alarm.	Operator reset.
Nov 14	About 0800 to 1000 hours.	Previous alarms.	Mechanics examined and tighten clutch.
Nov 16 to 17	1806 to about 1000 hours.	Side brush alarm. Taken out of service. Channel monitored.	Mechanics and electrical examined. No problem found.
Nov 17	About 1100 hours.	Sett brush to run when staff is present.	Set brush cycle to 8 hours.

The brush was set to cycle at 0030, 0830 and 1630 hours each day when the fisheries staff is available.

All other dewatering and cleaning systems operated satisfactory in automatic mode.

Bypass Facility: Facility winterization and maintenance continues.

River Conditions

River conditions during the week are outlined in Table 3 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 and testing continued, which did not influence the daily average spill recorded below.

Table 3. 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
147.1	112.6	0.0	0.0	57.0	56.0	6.0	6.0

Other

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

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

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. Mergansers, kingfishers and bald eagles were also observed.

Gulls and cormorants numbers in the tailwater area remained high at times. The birds 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, a large grebe flock nearing 75 birds was noted at times along with gulls or cormorants. Gulls and a few cormorants 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 11 - 17, 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. Unit 6 was removed from service on October 31 at 1103 hours for annual maintenance. Units 1, 3, and 4 were taken out of service one at a time for STS inspections on November 15 and 16.

Available units were operated within the 1% operating efficiency range (soft constraint), except for unit 3. Unit 3 was routinely operated a few megawatts below the operating efficiency range during this reporting period, due to the GDACS (Generic Data Acquisition Control System) needing to be updated with the narrower operating 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 14, 16, and 17.

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 south shore picketed leads were raised at the end of the fish counting season on November 1. The north shore picketed leads were raised on November 16, after the operation of the fish count slot barrier gate was restored and the gate was moved out of the way of the hoist.

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 on all inspections. The north shore entrance (NSE-1) depth and channel/tailwater head 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.

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 of the three north shore AWS pumps were in operation during the week. Five of the eight south shore AWS pumps were in operation throughout the week.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 7 square yards of debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 5%. 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 in 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 inspected on November 15 and 16, with no problems found.

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
23.3	12.7	0.0	0.0	57.0	55.0	8.1	7.5

*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, and 17. A total of approximately 14,325 juvenile shad (all mortalities) were found.

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 in the spillway basin close to the dam, on the south shore of the tailrace across from the coffer cells, and on Eagle Island. Increasing numbers of birds were observed foraging in the tailrace downstream of the bypass pipe outfall.

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

Project: Lower Monumental
Biologists: Bill Spurgeon and Chuck Barnes
Dates: November 11 - 17, 2016

Turbine Operation

The units are being operated within the soft constraint 1% peak efficiency criteria. Incursions outside of the 1% operational criteria occurred with units 2, 4, and 6 from 1650-2010 hours on November 10 due to a request from BPA.

Unit 1 was removed from service on December 10, 2014 for unit rehabilitation with an estimated return to service date of March 8, 2017. Unit 6 was removed from service November 7, 2016 for routine maintenance and is scheduled to return to service on December 1, 2016. Unit 4 was forced out of service at 1420 hours on November 17, 2016 for a NEXUS meter replacement and returned to service at 1505 hours the same day.

Adult Fish Passage Facility

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

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 6.4, 6.8 and 6.3 feet. South powerhouse channel/tailwater head was in 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 7.2, 7.2 and 7.3 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 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 12 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 30% 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 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
26.1	12.5	0.0	0.0	56.0	54.0	4.0	4.0

*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 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 this period.

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
November 11	---	---	---	---	---	---
November 12	---	---	---	---	---	---
November 13	---	---	---	---	---	---
November 14	---	---	---	---	---	---
November 15	---	---	---	---	---	---
November 16	---	---	---	---	---	---
November 17	---	---	---	---	---	---

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

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: November 11 - 17, 2016

Turbine Operation

All turbine units were available for service except unit 2. Unit 2 was placed out of service for an annual inspection on November 07. Unit 3 was returned to service on November 08 at 1740 hours which was missed in last week's report. 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 14, 15 and 16.

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 0.0 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 depths ranged between 8.1 and 9.0 feet. South shore channel/tailwater head differential was in criteria (criteria 1.0-2.0 ft.) on all inspections.

NPE1 and NPE2 weir gates were in criteria on all inspections and were on sill. Weir depths ranged between 7.1 and 7.7 feet (criteria $\geq$7.0 ft. or on sill). North powerhouse channel/tailwater head differential was in 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 6.3 to 7.3 feet (criteria $\geq$ 6.0 ft or on sill.) and were in depth criteria on all inspections. North shore channel/tailwater head differential was in criteria (criteria 1.0-2.0 ft.) on all inspections.

Collection Channel Velocity: The average surface water velocity measurements met criteria on all inspections and ranged between 2.1 and 2.5 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 11.

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. There was woody debris in the immediate forebay ranging from 200 and 500 sq. ft.

Spillway Weir: The TSW was removed on July 11.

ESBS/VBS: Electrical ESBS brush tests were performed on November 08. All brushes were determined to be operating satisfactorily.

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: Collection and transport ended for the season with the last truck leaving the facility on November 01.

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

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
22.8	17.5	0.0	0.0	54.6	54.0	6.0	5.2

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers in all units were inspected October 31. No fish were seen.

Invasive Species: The zebra mussel substrate monitor was inspected 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 11 - 17, 2016.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
November 11	None	0	0	0	0
November 12	None	0	0	0	0
November 13	None	0	0	0	0
November 14	0840	69	72	0	0
November 15	0945	92	89	0	0
November 16	0900	154	51	0	0
November 17	0800	106	40	0	0

*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 11 - 17, 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 outages for ESBS removals are as follows: November 15 - Unit 6 from 0600 hours to 1308 hours and Unit 5 from 1310 hours to 1609 hours; November 16 - Unit 4 from 0600 hours to 1030 hours and Unit 3 from 1032 hours to 1400 hours; November 17 - Unit 2 from 0603 hours to 1033 hours.

Adult Fish Passage Facility

Adult fish facilities were inspected by Corps biologists on November 14, 15, and 17.

Fish Ladder: Fish ladder exit head differential and depth over the weirs were in criteria (≤0.5' and 1.0-1.3', respectively) on all inspections. Picketed lead head differentials met criteria (≤ 0.3'). NSE elevation readings were taken from the ladder control system digital display this week due to the North elevator being out of service. An average of about 17.3 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 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. 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. North shore channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections.

Collection Channel Velocity: The collection channel average velocity met 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 149.6 square yards of debris was observed in the forebay this week.

ESBSs/VBSs: ESBSs were removed from service on November 15, 16, and 17.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The collection channel was dewatered at 1437 hours on November 17.

Collection Facility: The facility was dewatered November 17 and is currently in winter maintenance mode.

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

River Conditions

No spill is 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
23.1	18.1	0.0	0.0	52.0	51.0	5.0+	2.6

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: No inspections took place this week.

Invasive Species: The 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 trap is in seven day a week operation with a 19% sample rate.

Fish Rescue Operation: A fish rescue operation took place in the Dworshak unit 1 draft tube from 1130 hours to 1312 hours on November 16. One juvenile clipped Steelhead approximately 10 inches in length was recovered and returned to the tailrace.

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