U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#37-2016

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: November 4 - 10, 2016

Turbine Operation

All available turbine units were operated within the soft 1% peak efficiency criteria except on November 9 and 10 when the BPA (Bonneville Power Administration) requested operation outside the 1% range to meet load requirements. 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.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on November 4, 6 and 10.

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 continues to be 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 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 displayed faulty readings on October 10. The electrical staff was asked to examine the issue.

At the Oregon ladder, north powerhouse entrance NFEW3 measured 7.8 feet in depth on November 4. The biologist asked the control room operator to adjust the weir elevation set point. All other inspection points remained in criteria. As reported last week, SFEW1 and SFEW2 were placed in manual operation. This configuration continued until November 8 (at approximately 0730 hours) at which time, the electrical staff resolved the tailwater elevation sensor issue.

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. Multiple issues occurred this week, which will delay completion into December. Turbine unit testing is expected 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 remains under contract for major overhaul. Recently, contractors determined that the pump's main shaft had too many stress fractures through its length and replacement was warranted. The shaft is not a part that can be purchased off the shelf, and must be manufactured. Testing is still 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.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs): ESBSs are deployed in all units. ESBS camera inspections did not occur this week. The ESBSs in slots 1A, 6B, 6C, 8C, 12A and 12C remained in timer mode.

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. Orifice valve actuators were repaired in slots 11C and 14C on November 7.

All 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 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 and testing continued, which did not influence the daily average spill recorded below.

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
147.8	131.6	0.0	0.0	57.0	57.0	6.0	6.0

Other

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

Invasive Species: Mussel station examinations will occur in late November.

Avian Activity: Casual avian observations were performed during other inspections. A gull flock appears to be roosting at various locations near the project. Examples are the helipad, the Oregon shore boat dock parking lot and the upstream navigation lock wing wall. Great blue herons were also observed.

Gulls and cormorants numbers in the tailwater area remained high at times. Over 100 gulls were observed. 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 100 birds was noted at times along with gulls or cormorants. Gulls and 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 and Donald Dennis
Dates: November 4 - 10, 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.

Available units were operated within the 1% operating efficiency range (soft constraint), except when BPA requested operation outside the 1% range to meet load requirements on November 5 and 10. Also unit 3 was routinely operated a few megawatts below the operating efficiency range, 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 7, 8, 9 and 10.

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 will be raised as soon as power to the fish count slot barrier gate is restored, so the gate can be 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 8 square yards of debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 8%. 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 October 18 and 19, with no problems found. The next inspections are scheduled for the week of November 14.

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. The avian abatement hydrocannon at the end of the bypass pipe was turned off on November 5 or 6 due to diminished intensity of the spray. On November 9, the hydrocannon pump intake was cleaned of leaves and the hydrocannon was turned back on.

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

Fish Sampling: Sampling is done for the season. The raw water lines for the sampling facility were drained and winterized on October 26.

Removable Spillway Weir (RSW): Spill for fish passage began on April 3 at midnight and ended on September 1 at midnight.

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
30.2	12.1	0.0	0.0	58.0	57.0	8.8	8.0

*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, and 8. Approximately 4,800 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. A laser light was used unsuccessfully to try to scare off 10-20 cormorants that were foraging at the bypass pipe outfall.

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

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: November 4 - 10, 2016

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 March 8, 2017. Unit 5 was removed from service at 0658 hours on September 19 for annual maintenance and returned to service at 1248 hours on November 9, 2016. Unit 4 was removed from service for failing to synchronize with the system at 0552 hours on November 4 and returned to service at 1130 hours the same day.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on November 7, 8 and 9.

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 6.1, 5.8 and 7.0 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 6.7, 6.8 and 7.6 feet.

SSE2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head met 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 0 square yards of forebay debris observed during this report period. Gatewell debris ranged from 0 - 25% 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
28.2	20.2	0.0	0.0	56.3	56.0	4.8	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 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 this report period.

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
November 4	---	---	---	---	---	---
November 5	---	---	---	---	---	---
November 6	---	---	---	---	---	---
November 7	---	---	---	---	---	---
November 8	---	---	---	---	---	---
November 9	---	---	---	---	---	---
November 10	---	---	---	---	---	---

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

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: November 4 - 10, 2016

Turbine Operation

All turbine units were available for service except unit 3. Unit 3 was placed out of service for an extended annual on September 26. Unit 3 returned to service on November 08. No 1% violations to report this week.

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 needs to be performed.

Adult fishway inspections were performed on November 6, 7 and 8.

Fish Ladder: The ladder exit head differentials and water depth at Diffuser 13 maintained within 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 except on November 6 (depths of 7.7 feet and 7.8 feet, respectively) and ranged between 8.1 and 8.4 feet on the other days. 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 6.5 and 7.1 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 ranged between 5.5 to 6.8 feet (criteria $\geq$ 6.0 ft or on sill.) and met depth criteria on all inspections except on November 6. 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 were in criteria on all inspections and velocities ranged between 1.9 and 2.2 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 between 200 and 600 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 found in working order.

Orifices, Collection Channel, Dewatering Structure, and Flume: The gear box for the weirs in the primary dewatering structure was removed from service after an oil leak was discovered. The leak was subsequently contained and cleaned. The weirs 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 on November 01.

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
24.6	19.8	0.0	0.0	55.5	55.1	6.0	5.9

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers on all units were inspected October 31. No fish 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 04 - 10, 2016.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
November 4	None	0	0	0	0
November 5	None	0	0	0	0
November 6	None	0	0	0	0
November 7	0840	206	70	0	0
November 8	0830	249	52	0	0
November 9	0840	240	48	0	0
November 10	None	0	0	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 for transport has ended. Prawn numbers are outlined in Table 3 below.

Table 3. Daily Siberian Prawn Counts at Little Goose Dam, November 04 - 10, 2016.

Date	Sample	Collection
November 4	---	---
November 5	---	---
November 6	---	---
November 7	---	---
November 8	---	---
November 9	---	---
November 10	---	---
Totals	--	---

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 4 - 10, 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 3 which was previously removed from service at 0630 hours on October 17, was returned to service at 1106 hours on November 7.

Adult Fish Passage Facility

Adult fish facilities were inspected by Corps or Anchor QEA biologists on November 5, 7, and 9.

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 November 7 due to the north elevator being out of service. An average of about 5.0 square yards of debris was observed near the ladder exit.

Fish Ladder Entrances and Collection Channel: SSE1 and SSE2 weir gates were in 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. While on sill, the gate depth readings were 7.9 feet. North powerhouse channel/tailwater head differentials met 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 average collection channel 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 remains 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: Approximately 103.7 square yards of debris was observed in the forebay this week.

ESBSs/VBSs: ESBS/VBS inspections are completed for the season.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The collection channel is operating with 18 - 19 opened orifices. Orifices are being cycled every three hours.

Collection Facility: The facility is in secondary bypass 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
26.2	20.5	0.0	0.0	54.0	53.0	5.0+	5.0+

*Cooling water intake temperature.

Other

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

Invasive Species: The zebra/quagga mussel substrate was inspected October 16. No zebra/quagga mussel were found.

Avian Activity: Seasonal bird counts ended on October 31.

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

Adult Fish Trap Operations: The trap is in seven day a week operation with a 19% sample rate.

Fish Rescue Operation: No fish rescues took place this week.

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