U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#42-2016

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: December 9 - 15, 2016

Turbine Operation

Available turbine units operated outside the soft 1% peak efficiency criteria on December 9 and 10. Turbine unit 13, which is out of service for thrust bearing replacement, will return to service on December 30.

Adult Fish Passage Facilities

McNary fish biologists performed measured inspections of the Oregon shore fishway on December 9, 11 and 14.

The Washington ladder remains out of service. The lamprey passage improvements contractor began work on December 12. The count station windows were inspected and resealed on December 14 and 15.

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 the Oregon exit and along the shore.

The Oregon exit met all criteria. The count station window cleaning brush jammed in the lowered position twice this week and was reset. The regulating weir set point was adjusted on December 9. 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 Oregon ladder, all entrance weirs measured between 7.2 to 7.7 feet in depth all week. These readings were probably due to the juvenile facility being in emergency bypass. Both pool differentials remained in criteria. The south entrance control panel display exhibited faulty readings on December 14. The electrical staff immediately resolved the issue.

Oregon ladder collection channel surface velocities averaged 1.7 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.

Two of the three Oregon ladder fish pumps operated satisfactorily with two interruptions in service this week in support of electrical bus switches. Both pumps were out of service from 1230 to 1301 hours on December 13 and again from 1240 to 1249 hours on December 14. 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 is no longer suppling 450 cubic feet per second (cfs) to the north powerhouse pool.

Juvenile Fish Passage Facility

The fall bypass season continues. The system will remain in emergency bypass until ESBSs are removed.

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

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

No problems were observed in the gatewell slots.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs): ESBSs are deployed in all units. ESBS removals will begin December 16. No ESBS camera inspections occurred this week. The ESBSs in slots 1A, 1B, 6B, 6C, 8C, 12A and 12C remained in timer mode. The ESBSs in units 11, 12 and 14 were examined from the control room on December 13. The screen in 11C slot was inadvertently left in manual mode for 19 hours. The ESBS controller for unit 13 required rebooting on December 12. Following the reboot, the brush bar for the screen in slot 13A was observed not completing a full cycle.

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. Emergency bypass continues. The orifices will remain open until ESBSs are raised. Moisture continued to be bled from the orifice air supply line daily. All other dewatering and cleaning systems remain out of service for winter maintenance, which has begun on all three screen cleaning brushes.

Bypass Facility: Scheduled winter maintenance continues. One brief power outage occurred at the facility on December 13 and 14 in support of electrical bus switches. The outages had no adverse effect. The wet lab sample trough was repainted on December 15.

River Conditions

River conditions during the week are outlined in Table 1 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.

Table 1. 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
149.6	124.6	0.0	0.0	46.0	44.0	6.0	6.0

Other

Inline Cooling Water Strainers: The unit 8 cooling water strainer was examined on December 12. No smolts or juvenile lamprey were observed. Only juvenile shad mortalities were removed. The next cooling water strainer examinations will occur on January 3.

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

Avian Activity: Casual avian observations were performed during other inspections. A gull flock appears to be roosting at various locations near the project. A bald eagle and four hawk species were also observed. Cormorant numbers in the tailwater area remained low. Gulls and cormorants were roosting on the navigation lock wing wall, on other structures or on the water. They appeared to be feeding on juvenile shad in the powerhouse flow. In the forebay area, grebes and gulls were noted at times. Gulls were occasionally roosting on the rocks by the Washington shore boat dock. Overall, bird numbers appeared to have decreased.

Research: No onsite research is occurring at this time.

Fish Salvage: Fourteen channel catfish (ranging from 10 inches to 2.5 feet in length) and two sturgeon (each 3 to 4 feet long) were removed from the unit 13 draft tube and evacuated to the river on December 9. Six channel catfish (1 to 2 feet long) and four sturgeon (1 to 3 feet long) mortalities were also removed.

One live three inch small mouth bass was removed from the navigation lock on December 14. One clipped adult steelhead and one to two sturgeon approximately 4.5 feet were also observed between the laterals and could not be removed. Removed mortalities included one non-clipped adult Chinook and one non-clipped jack Chinook (both highly decomposed), one crappie and one small mouth bass. Both the crappie and the small mouth bass were approximately four inches in length and slightly decomposed. Six juvenile shad mortalities and six other decomposed, unidentifiable fish carcasses were also removed.

Project: Ice Harbor
Biologists: Ken Fone
Dates: December 9 - 15, 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 are being welded in place to fix the leak. Unit 2 was taken out of service on April 25 at 0606 hours for runner replacement.

Units 1, 4, and 6 were periodically operated slightly below the 1% operating efficiency range (soft constraint) during this reporting period, as requested by BPA to meet electrical load requirements. Unit 3 was routinely operated a few megawatts below the operating efficiency range during the week, 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 December 12, 13, and 14.

Upper Fish Ladders: The upper 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 upper south fish ladder inspection areas (head differentials at the fishway exit and picketed leads, and depth over the weirs) were in criteria on all inspections. Criteria for head differentials at ladder exits and picketed leads, and depth over the weirs are 0.5 feet or less, 0.3 feet or less, and 1.0-1.3 feet, respectively. The water surface above the fish ladder exits were clear of debris and the bubblers were operating satisfactorily. The picketed leads were previously raised out of the water as the fish counting season had ended.

Fishway Entrances and Collection Channel: The south shore entrance (SFE-1) depth and channel/tailwater head differential were in criteria on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater head differential were in criteria 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.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 5 square yards of debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 3%. Slot 2C was unwatered on July 6 to facilitate the unit 2 head gate sill plate repair.

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

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass operated with 19 to 20 opened orifices. Orifices were routinely cycled and back-flushed once per day. On December 6, cold weather began to adversely affect the accuracy of water level alarm sensors in the dewatering structure, triggering the mechanical screen cleaner to repeatedly cycle. In order to save on wear and tear, the mechanical screen cleaner is now being operated four time a day in manual control. On December 7, facility personnel was discovered that a gear linkage that operates the primary dewatering weirs was broken, so that only two-thirds of the overflow weirs are adjustable. The main water level in the dewatering structure is still being adequately controlled.

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
25.5	15.0	0.0	0.0	46.0	44.0	7.8	7.2

*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 December 1, 3, 5, 7, 8, 9 10, 13, and 15. A total of approximately 12,131 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 on the south shore of the tailrace across from the coffer cells, and on Eagle Island. Moderate numbers of gulls and cormorants were observed foraging in the tailrace downstream of the bypass pipe outfall. High numbers of gulls were foraging downstream of the powerhouse, presumably feeding on dead juvenile shad that were removed from the cooling water strainers and disposed of into the tailrace. A grebe that was observed in gatewell slot 6C on December 12 was hazed out through the orifice to the juvenile fish collection channel, and on out through the bypass pipe.

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

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: December 9 - 15, 2016

Turbine Operation

Turbine unit 1 was removed from service on December 10, 2014 for rehabilitation with an estimated return to service date of May 15, 2017. Unit 6 was removed from service November 7, 2016 for routine maintenance and is scheduled to return to service on December 22, 2016. Units 2 and 3 were rotated out of service during day time operating hours for forebay debris removal on December 9, 12, 13, 14 and 15.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on December 13, 14 and 15.

Fish Ladders: Fishway exit head differentials and depths over the weirs met criteria (≤ 0.5' and 1.0'-1.3', respectively) on all inspections.

Picketed lead head differentials 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 7.4, 7.5 and 7.6 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, readings were 8.1 and 8.5 feet. SSE2 was in criteria (6' above sill) on all inspections.

The 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 5 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 the report period. STS inspections were conducted November 1 and 2 with all screens found in good operating condition.

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

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

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

River Conditions

Summer spill operations in support of fish passage ended at 2400 hours on August 31. River conditions during the week are outlined in Table 1 below.

Table 1. River conditions at Lower Monumental Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature (^{o}F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
24.2	13.4	0.0	0.0	44.0	47.0	5.0	4.0

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on December 6. No live fish were recovered. Mortalities included 710 juvenile American shad.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on December 6.

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

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
December 9	---	---	---	---	---	---
December 10	---	---	---	---	---	---
December 11	---	---	---	---	---	---
December 12	---	---	---	---	---	---
December 13	---	---	---	---	---	---
December 14	---	---	---	---	---	---
December 15	---	---	---	---	---	---

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

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: December 9 - 15, 2016

Turbine Operation

All turbine units were available for service except unit 1. Unit 1 was placed out of service on December 12 for a shaft packing leak. 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 December 12, 13 and 14.

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 8.0 and 9.0 feet. South shore channel/tailwater head differentials met criteria (criteria 1.0-2.0 ft.) on all inspections.

NPE1 and NPE2 weir gates were in criteria on all inspections. Weir depths ranged between 6.6 and 7.2 feet and weirs were on sill (criteria $\geq$7.0 ft. or on sill). North powerhouse channel/tailwater head differential met criteria (criteria 1.0-2.0 ft.) on all inspections.

NSE1 and NSE2 weir gate depths were in criteria on most of the inspections and depths ranged between 5.8 to 6.8 feet (criteria $\geq$ 6.0 ft or on sill) meeting criteria on all inspections. The North shore channel/tailwater head differential met criteria (criteria 1.0-2.0 ft.) on all inspections.

Collection Channel Velocity: The average surface water velocity measurements were in criteria on all inspections and velocities ranged between 1.8 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 the NPE was 3.4 fps on December 12.

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 80 to 325 square feet.

Spillway Weir: The TSW is out of service and removed.

ESBS/VBS: Electrical ESBS brush tests were performed November 08. All brushes were found in satisfactory condition. Differential drawdowns were performed on unit 3 on December 08. All measurements met criteria.

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

Collection Facility: Winter maintenance is under way.

Transport Summary: The collection and transportation facility was unwatered without any difficulties 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
20.4	17.3	0.0	0.0	44.1	43.2	6.0+	6.0

*Ladder temperature.

Other

Invasive Species: The zebra mussel substrate monitor was inspected December 13. No mussels were seen.

Cooling Water Strainers: Cooling water strainers in all units were inspected December 12. No lamprey or salmonid species 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, December 9 - 15, 2016.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
December 9	None	---	---	---	---
December 10	None	---	---	---	---
December 11	None	---	---	---	---
December 12	0830	10	10	0	0
December 13	0830	25	0	0	0
December 14	0830	11	8	0	0
December 15	None	---	---	---	---

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

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

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

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

Project: Lower Granite
Biologists: Elizabeth Holdren and Stephen Hampton
Dates: December 9 - 15, 2016

Turbine Operation

Units are being operated within the soft constraint 1% peak efficiency criteria. Unit 1 remains out of service for Kaplan blade linkage repair. Unit 2 was out of service from 0605 hours on November 28 to 0736 hours on December 15 for annual maintenance. Unit 6 was out of service from 0717 to 1527 hours on December 14 for collection channel caisson installation.

Adult Fish Passage Facility

Adult fish facilities were inspected by Corps Biologists on December 14 and 15.

Fish Ladder: Fish ladder exit head differential and depth over the weirs met criteria (≤0.5' and 1.0-1.3', respectively) on all inspections. The picketed lead head differential also met criteria (≤ 0.3'). An average of about 6.0 square yards of debris was observed near the ladder exit. Diffuser 14 was removed from service from 0730 to 1830 hours on December 13 for reinforcement bulkhead removal.

Fish Ladder Entrances and Collection Channel: Powerhouse electricians operated fish ladder entrance weir gates one at a time from 0950 to 1410 hours on December 13 to check limit switches and make necessary adjustments prior to dewatering for winter maintenance.

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

NPE1 and NPE2 weir gates met depth 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 out of criteria (criteria ≥7' or on sill) with a 6.0 feet reading on December 14 and a 6.7 feet reading on December 15. The gate was out of criteria due to the control system failing to adjust to changing tailwater elevation. The gate was raised to 7.0 feet in manual mode immediately following the 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 differentials met criteria (criteria 1'-2') on all inspections.

Collection Channel Velocity: The average 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 101.3 square yards of debris was observed in the forebay this week.

ESBSs/VBSs: ESBSs have been removed for winter maintenance.

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

Collection Facility: The facility is currently undergoing winter maintenance.

Transport Summary: No fish transport occurring at this time.

River Conditions

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

Table 1: River conditions at Lower Granite Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (F^o)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
23.0	15.8	0.0	0.0	42.4	40.5	5.0	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: No strainer inspections occurred this week.

Invasive Species: The zebra/quagga mussel substrate was inspected December 6. No zebra/quagga mussels were found.

Avian Activity: Seasonal bird counts ended October 31.

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

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

Fish Rescue Operation: No rescue operations occurred this week.

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