U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#44-2016

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: December 23 - 31, 2016

Turbine Operation

The soft 1% peak efficiency criteria continued. Turbine unit 13, which is out of service due to thrust bearing issues, will return to service on February 28.

Adult Fish Passage Facilities

McNary fish biologists performed measured inspections of the Oregon shore ladder on December 23, 27, 28 and 29.

The Washington ladder remains out of service. The contractor continued adding lamprey passage slots to fishway weirs. Rehabilitated drive systems for weirs 334, 335 and 336 will be installed next week. The drives for weirs 338, 339 and 340 will be removed for rehabilitation.

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 shore ladder exit met 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.

The Oregon ladder north powerhouse entrance weirs measured depths between 7.4 to 7.6 feet all week. The biologist found NFEW3 in manual mode on December 27 and returned the weir to automatic operation. The south powerhouse entrance weirs measured between 6.9 and 7.5 feet in depth on December 23, 27 and 29. These low readings were probably due to the juvenile facility being closed for winter maintenance. Both pool differentials remained in criteria.

The general maintenance staff adjusted the powerhouse floating orifice gates on December 27.

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. Turbine unit testing is being scheduled to start February 6, 2017.

Two of the three Oregon ladder fish pumps operated satisfactorily with no interruptions in service. Both pumps operated with blade angles of 24 to 25 degrees. Fish pump 2 is currently under contract for major overhaul. Main shaft replacement has delayed completion. Pump 2 testing is scheduled for early March.

The juvenile facility is closed and is no longer suppling 450 cubic feet per second (cfs) to the north powerhouse pool.

Juvenile Fish Passage Facility

The winter maintenance season continues.

Forebay Debris/Gatewell Debris/Oil: Forebay debris loads at the powerhouse were minimal to light. Debris loads will be monitored throughout the winter.

Trash rack differentials were within normal levels. Trash rack differentials will be measured twice a week during the winter. Trash rack test cleaning will occur on January 10.

No problems were observed in the gatewell slots, which will be monitored twice a week during the winter.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs): All ESBSs were previously raised for winter maintenance, which will begin next week. The ESBS brush bar on the screen in slot 13A appeared to be partially damaged.

VBS differential monitoring will resume in April, 2017 when the ESBSs are lowered. VBS rehabilitations continued with new mesh being installed on torn VBS sections.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: Orifices remain closed for the winter. Moisture continued to be bled daily from the secondary air supply line, which supplies the air hoists and transition screen cleaning brush.

All dewatering and cleaning systems remain out of service. The side screen brush rehabilitation will begin next week. Repairs to the north side dewatering valve will occur after the side brush work is completed.

The drain for the transition area side overflow screens was found closed this week. It appears this drain has not been open for several seasons. The drain will be open next spring when the channel is watered up.

Bypass Facility: Scheduled winter maintenance continues.

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
165.5	132.4	0.0	0.0	42.0	41.0	6.0	6.0

Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur on January 3.

Invasive Species: The mussel station examinations on December 27 revealed no problems.

Avian Activity: Casual avian observations were performed during other inspections. A gull flock appears to be roosting at various locations near the project. Bald eagles, blue herons, night herons and mergansers were also observed.

Gull and cormorant numbers in the tailwater area appeared to have decreased. The birds 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. Pelicans returned to the project this week with 5 to 15 individuals being observed.

In the forebay area, grebes, cormorants and gulls were noted at times. Gulls and cormorants were occasionally roosting on the rocks by the Washington shore boat dock.

One cormorant mortality was noted in gatewell slot 8A.

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

Fish Salvage: There are no fish rescues to report.

Project: Ice Harbor
Biologists: Ken Fone
Dates: December 23 - 31, 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. Unit 1 was taken out of service on December 23 from 1006 hours to 1013 hours to accommodate BPA relay maintenance.

Unit 3 was routinely operated a few megawatts below the operating efficiency range during the reporting period, due to the GDACS (Generic Data Acquisition and 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 27, 28, and 29.

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 are raised out of the water as the fish counting season has 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. As of December 21, six of the eight south shore AWS pumps were in operation.

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 3%. Slot 2C has been unwatered since July 6 to facilitate the unit 2 head gate sill plate repair.

STSs/VBSs: The STSs are stored in their gatewell slots for annual winter maintenance.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass was unwatered on December 21 for winter maintenance.

Juvenile Fish Facility: The juvenile fish facility is unwatered for the season.

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
25.9	10.5	0.0	0.0	41.0	40.0	7.3	7.1

*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, 15, 17, 18, 19, 22, and 29. A total of approximately 14,830 juvenile shad (all mortalities) were found in December.

Invasive Species: No new exotic species have been found.

Avian Activity: There were moderate numbers of grebes, pelicans, cormorants, gulls, and mergansers observed around the project. Many of the birds were resting on Eagle Island. Moderate numbers of gulls and mergansers were foraging downstream of the powerhouse. About 50 grebes have been observed foraging in the forebay.

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

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: December 23 - 31, 2016

Turbine Operation

Unit 1 was removed from service on December 10, 2014 for Unit rehabilitation with an estimated return to service of May 15, 2017. Unit 6 was removed from service on November 7, 2016 for routine maintenance and returned to service at 1116 hours on December 30, 2016. Units 2 was rotated out of service (OOS) during day time operating hours for forebay debris removal on December 24, 27, 28 and 29. Unit 3 was rotated out of service (OOS) during day time operating hours for forebay debris removal on December 24, 27, 28, 29 and 30. Units 4 was rotated out of service (OOS) during day time operating hours for forebay debris removal on December 28 and 30. Unit 5 was OOS during daytime operating hours for forebay debris removal on December 30.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on December 27, 28 and 29.

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 the 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 7.8, 7.6 and 6.8 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate met depth or sill criteria (criteria: ≥ 8' or on sill) during all inspections. While on sill, the 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 2 and 3 were operated throughout this report 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 period. Gatewell observations could not be made due to STSs in winter storage.

STSs/VBSs: All STSs have been removed for the winter.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile collection channel, primary dewatering structure and bypass flume were dewatered for the winter on December 21.

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 this report period 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
24.7	11.6	0.0	0.0	39.0	38.5	5.0	4.5

*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 23	---	---	---	---	---	---
December 25	---	---	---	---	---	---
December 25	---	---	---	---	---	---
December 26	---	---	---	---	---	---
December 27	---	---	---	---	---	---
December 28	---	---	---	---	---	---
December 29	---	---	---	---	---	---
December 30	---	---	---	---	---	---
December 31	---	---	---	---	---	---

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

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: December 23 - 31, 2016

Turbine Operation

All turbine units were available for service. 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 19, 20 and 21.

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 and held steady at 0.1 feet (criteria $\leq$ 0.3 ft.). The air bubbler used to prevent debris from collecting near the fish 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 10.0 feet. South shore channel/tailwater head differential 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 6.8 and 8.7 feet and were on sill (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 of the inspections and ranged between 6.1 to 7.7 feet (criteria $\geq$ 6.0 ft or on sill.) and met 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 were in criteria on all inspections and ranged between 1.7 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 little to no woody debris in the immediate forebay this week.

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

ESBS/VBS: All ESBSs have been removed for winter maintenance.

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

Collection Facility: Winter maintenance is currently underway.

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

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* (°F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
25.4	18.8	0.0	0.0	39.0	38.2	6.0+	6.0+

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers in all units were inspected December 12. No lamprey or salmonid species were seen.

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

Avian Activity: Seasonal bird counts have ended for the season.

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
Biologist: Elizabeth Holdren
Dates: December 23 - 31, 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 remains forced out of service due to blade seal packing failure.

Adult Fish Passage Facility

Adult fish facilities were inspected by Corps Biologists December 27, 28, and 29.

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 differential met criteria (≤ 0.3'). An average of about 0.0 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 differential was in criteria (criteria 1'-2') on all inspections.

NPE1 and NPE2 weir gates were in depth criteria (criteria ≥8' or on sill) on all inspections with the exception of a 7.8 reading on December 28. This was likely due to a misreading of the staff gauge or a delay in gate adjustment to changing tailwater elevation. FSC (Fishway System Control) readings were in criteria.

North powerhouse channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections.

NSE1 was in depth 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. The north shore channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections.

Collection Channel Velocity: Collection channel velocity met criteria (criteria 1.5-4.0 fps) during 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 58.3 square yards of debris was observed in the forebay this week.

ESBSs/VBSs: ESBSs are removed for winter maintenance.

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

Collection Facility: The facility is currently in winter maintenance mode.

Transport Summary: No fish transport is 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
23.9	13.5	0.0	0.0	41.5	39.0	5.0	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water inspections are scheduled for late January.

Invasive Species: No zebra/quagga mussels were found December 6.

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: Fish rescues were performed in the Unit 2 scrollcase on December 23. Recoveries included 1 unclipped juvenile Chinook, 1 juvenile carp, 1 sandroller, and 1 adult sucker. All fish were released live in the tailrace at Illia Landing.

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