U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#03-2016

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: March 11 - 17, 2016

Turbine Operation

McNary had all 14 units available for power generation this week. Turbine unit outages are recorded in Table 1 below. "Rolling" units involves operating and taking the units out of and back into service sequentially from south to north, which moves forebay debris toward the spillway. On April 1, the hard 1 percent peak efficiency constraint will begin.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
1 thru 8	Mar 14	5.4 hours total.	"Rolled" units to move forebay debris to spill.
3 thru 12	Mar 16	11.8 hours total.	"Rolled" units to move forebay debris to spill.
7	Mar 16	1.5 hours.	High pressure oil injection system (HPOIS) (thrust bearing oil pump) filters obstructed.

Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on March 13, 15 and 17. Communication was lost to the Washington ladder passive integrated transponder (PIT) station on March 17 at 1600 hours. Pacific State Marine Fisheries Commission (PSMFC) personnel replaced the fiber optic connection the next day.

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. Both ladder exits met all criteria during measured inspections. Debris loads were minimal at both exits.

At the Washington exit, the regulating weir set point was adjusted on March 15.

At the Oregon exit, the regulating weir set point was adjusted on March 13 and 17.

Oregon exit traveling screen differential monitoring revealed no problems.

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 were in criteria.

At the Oregon north powerhouse entrance, weirs NFEW2 and NFEW3 measured 7.7 to 7.8 feet in depth on March 13 and 15. NFEW weir depth readings have been impacted by the lack of auxiliary water usually provided by the juvenile system. The juvenile system is currently out of service for winter maintenance. Both weirs measured 6.9 feet in depth on March 17. The tailwater sensor reading was 1.3 feet higher than the measured reading. The sensor was immediately recalibrated.

At the south entrance, weir SFEW1 measured 7.8 to 7.9 feet in depth on March 15 and 17. Weir SFEW2 measured 7.8 feet in depth on March 17. Higher tailwater elevations possibly contributed to these readings.

The Oregon ladder pool differentials were in criteria all week.

Collection channel surface velocities averaged 2.2 feet per second.

Auxiliary Water Supply System: The Wasco County Public Utility District (PUD) turbine unit in the Washington ladder remains out of service for runner replacement, which has been delayed to an undetermined date. The bypass has functioned satisfactorily.

Two of the three Oregon ladder fish pumps operated satisfactorily with no interruptions in service this week. Both operated with blade angles of 25 degrees. Fish pump 2 is currently under contract for major overhaul with completion scheduled for September 2016.

The juvenile facility is not supplying 450 cfs to the north powerhouse pool and is currently out of service.

Juvenile Fish Passage Facility

As mentioned above, the juvenile system remains dewatered for winter maintenance. The system will return to service on March 29.

Forebay Debris/Gatewell Debris/Oil: The forebay debris load remained heavy. Debris spill operations scheduled between March 14 and March 17 were not successful.

As reflected in Table 1 above, units 1 through 8 were “rolled” on March 14 with spill briefly occurring through bay 21. The debris did not move to the spillway due to high west winds. No attempt was made to remove the debris on March 15 due to high west wind. Units 3 through 12 were “rolled” on March 16 with spill through bay 21 and no wind present. The highest spill volume was 40 thousand cubic feet per second (KCFS). Spill occurred between 1155 to 1307 hours and 1409 to 1523 hours. The debris did not move to the spillway. The spill volume was possibly insufficient. No attempt was made on March 17 due to prevailing east winds.

Another debris spill operation is scheduled to take place between March 22 and 23. A tug and boom will be used to move the debris to bay 21.

No high trash rack differential measurements were recorded. Trash racks will be cleaned the last week in March.

Fish screen gearbox oil was removed from slot 7C on March 15 with an absorbent boom.

Extended-length submersible bar screens (ESBSs)/Vertical Barrier Screen (VBSs): All ESBSs are raised and winter maintenance continues.

VBS differential monitoring will resume with ESBS installations, which will begin April 5. VBS rehabilitations continued.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The orifices remain closed for the winter maintenance season, which will conclude in late March.

Bypass Facility: Maintenance will continue until late March. The electrical staff performed scheduled maintenance on all interior, external and emergency lighting. The fisheries and natural resources staffs repaired a potable water leak.

River Conditions

River condition data during the week was provided by the McNary control room and is outlined in Table 2 below. The data period runs from 0000 to 2400 hours each day. Flows and spill are recorded in one-thousand cubic feet per second. Temperatures are recorded in degrees Fahrenheit.

On March 11, the spillgate in bay 21 was configured to split leaf, which allows more surface flow, for the debris spill operation discussed above in the Forebay Debris section. Spill occurred on March 14 and 16 for the debris removal operation. Average daily spill was 0.1 and 2.6 KCFS, respectively.

Spillway crane and hoist preparations continued.

Table 2. River Conditions at McNary Dam.

Daily Average River Flow		Daily Average Spill		Water Temperature (Unit 1 scroll case)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
225.9	174.2	2.6	0.0	43.0	42.0	5.6	4.6

Other

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

Invasive Species: The next mussel station examinations will occur in late March.

Avian Activity: This week a few gulls, cormorants and an occasional loon were observed. Zone counts will begin in April.

Bird distress call deployment and installation of bird wire on the navigation lock wing wall were completed. This week, two inverted (down facing) sprinklers were installed at the bypass outfall. There are now a total of four sprinklers at the outfall.

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

Project: Ice Harbor
Biologist: Ken Fone
Dates: March 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 will be replaced to fix the leak. Units are being operated within the 1% operating efficiency range (soft constraint).

Unit 5 scroll case was unwatered on March 15 to investigate the oil leak. During unwatering, personnel entered the scroll case for fish recovery operations. The only fish observed were two juvenile shad mortalities.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on March 14, 15, and 16.

Fish Ladders: The north fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. The south fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. Criteria for head differentials at ladder exits and picketed leads, and depth over the weirs are 0.5 feet or less, 0.3 feet or less, and 1.0-1.3 feet, respectively. The water surface above the fish ladder exits were clear of debris and the bubblers were operating satisfactorily. The counting of adult fish ended for the season on October 31, 2015, so the south and north shore picketed leads were put in their raised positions on November 2 and 5, respectively. Adult fish counting will resume on April 1.

Fishway Entrances and Collection Channel: The south shore entrance (SFE) depth and channel/tailwater differential were in criteria on all inspections. The north powerhouse entrance (NFE) depth and channel/tailwater differential were in criteria, except for a depth of 7.7 feet on March 14 caused by entrance weir gate calibration problems. Electricians will calibrate fishway entrance gate elevation readouts the week of March 21. The north shore entrance (NSE) depth and channel/tailwater 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/second.

Auxiliary Water Supply (AWS) System: Two of three north shore AWS pumps were operated during the week. North shore AWS pump 2 was out of service from 1630 hours on March 3 to

1605 hours on March 14 to replace a bad relay switch. Six of the eight south shore AWS pumps were operated throughout the week.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was approximately 23 square yards of debris observed in the forebay.

STSs/VBSs: STSs are raised out of the water and stored in the gatewell slots for annual maintenance.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass is unwatered for annual maintenance.

Juvenile Bypass Facility: The bypass facility is unwatered for annual maintenance.

Fish Sampling: Sampling operations are scheduled to begin April 4.

Removable Spillway Weir: Spill for fish passage is scheduled to start on April 3.

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
65.0	53.2	0.0	0.0	44.0	44.0	6.4	6.0

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Monthly turbine cooling water strainer inspections will take place later in March.

Invasive Species: No new exotic species have been found.

Avian Activity: Low numbers of piscivorous birds were seen around the project during the week.

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

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: March 11 - 17, 2016

Turbine Operation

The units are being operated within the soft constraint 1% operational criteria. Unit 1 was removed from service on December 10, 2014 for Unit Rehabilitation with an estimated return to service date of January 12, 2017. Units 2, 3, 4, 5 and 6 were rotated out of service for trash rack raking on March 15, 16 and 17.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on March 14, 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 depth or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill the gate depth readings were 7.8', 7.7' and 7.6 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in depth criteria (criteria: ≥ 8' or on sill) on all inspections. 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 and will be out of service throughout this season unless an emergency occurs. This unit has a bushing problem.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 343 square yards of forebay debris observed during this period. No oil was observed in gatewells.

STSs/VBSs: STSs are raised for winter maintenance. The STSs were inspected via rotation on deck on March 17. All screens tested OK and are ready for deployment with the exception of the one located in gatewell 6A. This STS rotated in the wrong direction. Powerhouse maintenance

personnel were informed and the problem will be corrected before deployment. The STSs are scheduled to be installed the week of March 28.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel is dewatered for winter maintenance. The primary bypass outfall water cannons are also dewatered. Both systems are scheduled to be "watered up" the week of March 21.

Collection Facility: The facility is in winter maintenance mode.

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

River Conditions

Spill occurred on March 11 as requested by BPA due to lack of electrical load and on March 15 due to units being out of service to rake trash racks. 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
66.4	54.2	5.3	0.0	45	44	3.8	3.3

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on March 1. Nine live lamprey were recovered. Mortalities included approximately 195 juvenile lamprey, 2 Siberian prawns and 5 other (shad).

Invasive Species: No zebra mussels were observed at the monitoring stations on March 3.

Avian Activity: Gulls and cormorants were the dominant piscivorous bird species observed during fish ladder inspections this week.

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

Project: Little Goose
Biologist: Richard Weis
Dates: March 11 - 17, 2016

Turbine Operation

All turbine units were available for service throughout this report period except unit 5. Unit 5 is out of service for digital governor installation. Soft constraint 1% peak efficiency criteria are in effect.

Adult Fish Passage Facility

The adult fishway was placed back into service starting on February 22 beginning at 0800 hours. The new Fishway Control System still does not work properly. System will be in manual mode until repairs can be made.

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

Fish Ladder: The ladder exit head differentials held steady at 0.1 feet (criteria $\leq$ 0.5 ft.). Water depths over the weirs held steady at 1.2 feet (criteria 1.0-1.3 ft.) and picketed head differentials held steady at 0.0 feet (criteria $\leq$ 0.3 ft.). Some debris was observed at the picketed leads or the ladder exit area and was removed. The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily.

Fishway Entrances and Collection Channel: Channel to tailwater head differentials ranged between 1.1 and 3.3 feet (criteria 1.0 to 2.0 ft.). Fish pump 2 was restarted during the inspection on March 16. SSE weir depths ranged between 6.0 and 7.4 feet (criteria $\geq$ 8.0 ft). NPE weir depths ranged between 4.6 and 6.4 feet (criteria $\geq$7.0 ft. or on sill). NSE weir depths ranged between 4.1 to 5.5 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured at the North powerhouse ranged between 1.2 and 1.6 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: Fish pump 2 was restarted after a new oil pump was installed on March 16 at 1330 hours. Fish pump 1 is still waiting to be installed. Presently fish pump 2 and 3 are running. Water velocity measurements at the north Powerhouse using the Rickly velocity equipment was not performed this week.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: The trash/shear boom is currently still on shore. Efforts are underway to have it repaired. Woody debris in the immediate forebay was estimated to be between 4,500 to 13,125 square feet. Woody debris was observed in the gatewells but is not removable as the raised ESBSs currently block gatewell slot access.

Spillway Weir: The spillway weir is scheduled to be placed back in service April 3 at the start of spring spill for fish passage.

ESBS/VBS: ESBSs are raised and removed from service for maintenance.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile bypass system is scheduled to be placed back into service in March.

Transportation Facility: The transportation facility is scheduled to be placed back into service in March.

Transport Summary: Fish transport will begin in late April or early May.

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
63.2	54.1	0.0	0.0	45.2	45.1	3.9	3.6

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers on all units were last inspected on March 17. A total of 23 juvenile lamprey mortalities (Ammocoete) were removed.

Invasive Species: The zebra mussel substrate monitor is scheduled for inspection in April.

Avian Activity: Bird counting and hazing will resume in April.

Project: Lower Granite
Biologists: Elizabeth Holdren, Robert Horal
Dates: March 11 - 17, 2016

Turbine Operation

Units are being operated within the soft constraint 1% operational criteria.

Adult Fish Passage Facility

The automatic fish ladder control system was upgraded during the winter maintenance outage. Ongoing adjustments to the automatic control system are being made to address internal functioning errors in the programs. Entrance gates found out of criteria during ladder inspections due to fish ladder control system problems are manually adjusted to depth or sill criteria and left in manual mode until programmers return to make adjustments. Adult fish facilities were inspected by Corps biologists on March 14, 15, 16, 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 differential was in criteria (≤ 0.3'). An average of about 7.0 square yards of debris was observed near the fish ladder exit.

Fishway Entrances and Collection Channel: SSE1 and SSE2 weir gates were in depth criteria (criteria ≥8' or on sill) on all inspections except for one reading of 7.8 feet on March 14. This out of criteria reading was related to the fish ladder control system issues. South shore channel/tailwater head 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. NPEs were set to sill elevation of 628.0 feet in local mode on March 10 due to the automatic control system adjusting the gates beyond their sill limits. The gates were returned to automatic mode following the March 15 inspection. 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) on two inspections with gate depth reading of 6.4' and 4.5 feet March 14 and 17, respectively. These two out of criteria reading were also related to the fish ladder control system issues. NSE2 has been out of service since 2011 and remains set with a chain fall hoist in the closed position to improve channel/tailwater head differentials. North shore channel/tailwater head differential was in criteria (criteria 1'-2') on all inspection.

Collection channel average velocity was in 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 2 and 3 operating. Return to service of pump 1 is pending bulkhead installation.

Fish Ladder Temperature Control System: One stranded steelhead kelt was observed swimming in the upper section of the fish ladder temperature control structure that supplies water to diffuser 14 intake March 16 and 17. The steelhead must have entered the structure through the opening located about 65 feet below the elevation of the forebay.

This may be an isolated incident, however, observation of one fish in the structure during periods of low fish passage suggests this structure may become an area of concern as fish passage increases. There is no current method for rescuing fish from this structure. Discussions on possible fish rescue procedures and equipment are being discussed.

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. No oil was observed in the gatewell slots.

ESBSs/VBSs: ESBSs are scheduled to be installed March 21-24.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: The collection channel is scheduled to return to service on March 21. The South shore makeup water valve drive shaft and operator repairs were tested March 14 with a return to service date of March 21.

Collection Facility: The collection facility is scheduled to be watered up for testing March 21.

Transport Summary: Fish transport is not occurring.

River Conditions

No spill 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
64.2	55.7	0.0	0.0	44.2	43.8	4.2	3.3

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers are scheduled for inspection late March.

Invasive Species: The zebra/quagga mussel substrate was deployed March 1.

Adult Fish Trap Operations: The trap is in 24 hour operation Monday-Friday at a 17% sample rate.

Fish Rescue Operation: No fish rescue occurred this week.

Research: No onsite fish research is occurring at this time.