U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#42-2014

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: December 12 – 18, 2014

Turbine Operation

McNary had 10 to 11 units available for power generation this week. On November 1, the soft constraint one percent criterion began. This week, operational units ran outside the criteria when requested by the BPA. The weather for the week was fairly mild. Unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Dam.

Units	Outage Dates	Outage Length	Main Reason for Outage
11	Sep 18, 2013 to Jan 31, 2015	About 1 year and 4.5 months.	Turbine bearing issue continues.
4	Mar 27 to Jan 31, 2015	About 10 months.	Turbine bearing issue continues.
9	Aug 11 to Mar 25, 2015	About 7.5 months.	Maintenance then rewind contract.
5	Nov 24 to Dec 17	23 days.	Replaced generator air cooler.
1 & 2	Dec 16	4.4 & 7.4 hours each.	ESBSs removed for season.
1 & 2	Dec 16	20 minutes each.	Transmission line 1 test.
3, 6 & 7	Dec 17	5.5, 7.5 & 5.0 hours each.	ESBSs removed for season.
8, 10 & 12	Dec 18	4.2, 6.3 & 4.7 hours each.	ESBSs removed for season.

Adult Fish Passage Facilities

On December 12, 14 and 17, the McNary fisheries biologist performed measured inspections of the adult fishways.

Fish Ladder Exits: During measured inspections, both ladder exits met all Fish Passage Plan criteria. The exits had no debris issues, though we are noting an increase in milfoil on the Washington ladder exit trash racks.

At the Washington exit, the operators reset seven alarms this week at weir 337. On December 15 and 16, the electrical staff serviced weir 337 and the exit's control panel. The exit set points were also adjusted.

At the Oregon exit, traveling screen differentials remain low. The operators reset one false differential alarm this week. On December 16, the operator also adjusted the exit's set points. Finally, the project staff worked on the walkway lighting.

Fishway Entrances and Collection Channel: At the Washington ladder entrance, all inspection points were in criteria. In the near future, the project will replace the LEDs (Light Emitting Diodes) for W2 and W3 with a panel view.

At the Oregon ladder entrances, all inspection points were in criteria except on December 14 at the north powerhouse entrance, where NFEW3 measured 7.9 feet. This is probably due to the lack of supplemental water from the juvenile system. At the south powerhouse entrance, SFEW1 and SFEW2 continue to have slight calibration drifts. Electrical upgrades of the Oregon entrances will be completed in the near future.

Collection channel surface velocities averaged 1.6 feet per second.

Auxiliary Water Supply System: For the report week, the PUD turbine unit in the Washington ladder had no interruptions in service.

Fish pumps 1 and 3 ran with blade angles of 30 degrees with one interruption in service. On December 16, both pumps were briefly out of service in the afternoon in support of the transmission line 1 outage and bus switching mentioned above. Pump 2 is currently out of service for major overhaul under contract. This work should be completed by September, 2015.

The fish pump house remains off limits to fisheries staff due to the presence of asbestos. On December 12, a contractor began monitoring the asbestos. The Oregon ladder criteria points should indicate if there are any issues with the fish pumps and pump alarms are included in the control room's monitoring system.

The juvenile facility is no longer supplying the usual 450 cfs to the north powerhouse pool.

Juvenile Fish Passage Facility

The fall bypass season continues with the system in emergency bypass mode. This will protect the channel and the facility from severe winter weather until the ESBSs are raised and the orifices are closed. Winter maintenance continues to progress.

Forebay Debris/Gatewell Debris/Oil: Floating forebay debris, consisting mainly of milfoil and woody material, was minimal to light. We noted no fresh incoming debris and there was no debris at the spillway.

Trash rack differential readings were satisfactory and no racks were cleaned. We will be monitoring the trash rack differentials throughout the winter season.

We observed no problems in the gatewell slots.

ESBSs/VBSs: At the start of this week, ESBS's were already removed from units 4, 5, 9 and 11, as these units were slated to remain out of service past December 15. From December 16 to 18, ESBSs were raised in units 1, 2, 3, 6, 7, 8, 10 and 12. On December 19, the project staff plan to remove the screens in units 13 and 14.

The screens in slots 1A, 1B, 2B, 6A and 13C remained in timer mode until they were raised. On December 12 and 13, the screen in 14B slot was found to be "short cycling" (i.e.: cleaning brush reversing direction before reaching the end of the screen) twice each day. After resetting the screen each time, on December 13, the operator switched the screen to timer mode. This screen is to remain in this mode until removal on December 19. On December 13, the screen in slot 2B cycled twice with just one push of the start button. The technical staff is looking into the issue. This may explain why ESBSs in timer mode gain an extra cycle from time to time.

Camera inspections have concluded for the season. However, we did examine each screen after it was raised. So far, no ESA listed species or lamprey have been noted on the ESBSs. We did note that the screen in slot 3A had a brush bar which appeared not to fully clean one of the upper corners. Also, the screen in slot 8C appeared to have a brush that was cycling about a foot short from the top of the screen.

VBS differential monitoring revealed no screen out of criteria even when units were operating at loads close to 80 megawatts. No screens were cleaned. Since ESBSs are being raised, VBS differential measurements have concluded for the season. VBS rehabilitation continues with unit 11 as the staging area.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: With emergency bypass, 42 orifices remained open all week. We continued to note moisture in the orifice actuators' air supply line. The moisture is bled off daily, and orifice operators ate monitored as needed. The orifice will remain open until December 22 by which time all ESBSs will have been raised.

Channel systems are winterized and scheduled winter maintenance continues.

This week, the electrical staff continued replacing all corroded junction boxes with stainless steel ones. Also, they replaced electrical conduit as needed. Finally, they replaced the rectangular screen cleaner's motor and gearbox, which raises and lowers the brush. The damaged motor and gearbox will be rebuilt so these parts can be used as spares in the future.

Bypass Facility: The facility remained dewatered and protected from possible freeze breakage. Winter maintenance continues. No PIT tag detection occurs during emergency bypass.

The fish facility staff continued separator rehabilitation while wearing proper protective equipment. Most of the rust has been removed. Repainting the separator will begin after the new year, weather permitting.

On December 16, from approximately 1530 to 1600 hours, the facility experienced a power outage during transmission line 1 tests.

River Conditions

River conditions during the week are outlined in Table 2 as provided by COE data. Our data day runs from 0000 to 2400 hours each day.

This week, the TSW in bay 20 was opened from December 12 to December 14 in support of the adult fallback study. The TSW was closed for the remainder of the week. The spill recorded below is all from the TSW.

Table 2. River conditions at McNary Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temp. (^{o}F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
159.9	136.2	9.0	0.0	46	45	6.0	6.0

Temperatures readings were taken from the Unit 1 scroll case.

Other

Inline Cooling Water Strainers: The next cooling water strainer examination will occur on January 6.

Invasive Species: The zebra mussel station examination on December 15 revealed no problems. That day, we installed a new station at the Oregon ladder exit.

Avian Activity: Bird counts are no longer occurring. Repairs to the outfall water cannon pump are scheduled for mid-February, 2015.

During the course of other inspections, we noted in the tailwater area, gulls feeding in the powerhouse flow, at the emergency bypass outfall and in the TSW flow. We observed gulls and cormorants roosting on the navigation lock wing wall, which is part of the spill zone. Bird numbers, which appear to be decreasing, are affected by the juvenile shad out migration, their own migratory patterns and the weather. In the forebay area, we observed an occasional gull, cormorant, grebe or night heron. No grebes were observed elsewhere. We observed gulls occasionally on the rocks by the Washington boat dock. There appears to be a flock of gulls, which roost at various locations around the project.

Research: The adult steelhead fallback study continued on December 15. This week, transducers were removed from the ESBSs as they were being raised. The University of Idaho's winter adult steelhead radio tracking study continues.

Project: Ice Harbor
Biologist: Ken Fone
Dates: December 12 – 18, 2014

Turbine Operation

Unit 3 was taken out of service on July 7 at 1346 hours to investigate a generator electrical grounding problem and for annual maintenance, and remains out of service due to an oil leak from the hub. The plan for the fall and winter is to convert unit 3 into a fixed-blade unit to remedy the problem. Unit 2 was removed from service on October 14 at 0940 hours for digital governor installation. Unit 6 was out of service from December 8 at 1245 hours to December 16 at 0909 hours to accommodate BPA work on the Ice Harbor-Franklin No. 3 115 kV line and due to a faulty sectionalizing disconnect. Units 5 and 4 were out of service on December 12 from 0803 hours to 0916 hours and from 0811 hours to 0916 hours, respectively, to perform switching on line No. 3 at the completion of the BPA line work. Unit 6 was taken out of service on December 16 at 1442 hours due to the faulty sectionalizing disconnect. Units 4, 5, and 1 were out of service for several hours (one at a time) on December 16 and 17, for STS removals. Units 5 and 4 were out of service on December 17 from 0633 hours to 0810 hours and from 0636 hours to 0809 hours, respectively, to perform the switching on line No. 3, required by the faulty sectionalizing disconnect, before taking unit 1 out of service for STS removal.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on December 15, 16, and 18.

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 north and the south shore picketed leads were put in their raised positions on November 3. The counting of adult fish ended for the season on October 31.

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 on all inspections. 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.

Auxiliary Water Supply (AWS) System: Two of the 3 north shore AWS pumps were operated throughout the week. Six of the 8 south AWS pumps were operated.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was little to no debris observed in the forebay and gatewells.

STSs/VBSs: Unit 3 STSs and unit 2 STSs were removed for the season on November 4 and December 10, respectively, since both units remained out of service past December 15. Unit 4, 5, and 6 STSs were removed on December 16 and unit 1 STSs were removed on the morning of December 17.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass was placed in operation on March 17. The bird abatement hydro-cannon was turned off and winterized for the season on November 13 due to increasing ice buildup on the outside of the hydrocannon and bypass outfall pipe. On December 10, the mechanical screen cleaner at the primary dewaterer was taken out of service for the remainder of the season due to possible failure of the gear box that raises and lowers the brush. Fish facility personnel and powerhouse shift operators monitored channel water levels and used the air burst system to clean the downstream section of the inclined screen for the remainder of the season. The collection channel operated with 15 to 20 orifices open this week until the juvenile fish bypass was unwatered for the season on the afternoon of December 17. Adult fish recovered during unwatering operations were released to the river in good condition. These included: 43 clipped steelhead, 20 unclipped steelhead, 1 clipped Chinook, and 3 channel catfish.

Juvenile Bypass Facility: The bypass was unwatered for the season on December 17.

Fish Sampling: Sampling operations began on April 2 and ended on July 15.

Removable Spillway Weir: Spill in support of fish passage began on April 3 and ended on August 31. The contractor for the spill bay 2 modifications poured concrete for the modification of the ogee, and continue diving to install temporary bulkheads in preparation for the modification of the flow deflector.

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
32.1	26.2	0	0	46	45	9.4	8.3

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: Monthly turbine cooling water strainer inspections took place on December 16 and 17. Approximately 340 juvenile shad mortalities were found.

Invasive Species: No new exotic species have been found.

Avian Activity: Contracted hazing of piscivorous birds for 16 hours per day began on April 1 and ended on June 30. The piscivorous bird count program at the project began on April 1 and ended on July 15. Relatively moderate to high numbers of gulls, cormorants, grebes, mergansers, and pelicans, were seen around the project during the week.

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

Project: Lower Monumental
Biologists: Bill Spurgeon
Dates: December 12 – 18, 2014

Turbine Operation

The units are being operated in soft constraint of the 1% operation criteria. Unit 1 was removed from service for annual maintenance on December 10 at 0745 hours. Unit 2 was removed from service at 1000 hours on December 17 due to governor pump pressure control problems. Units were rotated out of service for STS raising on December 16 and 17.

Adult Fish Passage Facility

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

Fish Ladders: Fishway exit head differentials and depths over the weirs were within criteria (≤ 0.5' and 1.0'-1.3', respectively) on all inspections. Picketed lead head differentials were in criteria (≤ 0.4' and ≤ 0.3' for north and south shore fishways, respectively) on all inspections.

Fishway Entrances and Collection Channel: NSE1 and NSE2 weir gates were in depth criteria (criteria: ≥ 8' or on sill) on all inspections. North shore channel/tailwater head was in criteria (1'-2') on all inspections.

SPE1 and SPE2 weir gates were in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill the gate depth readings were 7.0, 7.0' and 6.7 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in sill or depth criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill the gate depth readings were 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.

The collection channel velocity remained in criteria (1.5 - 4.0 ft/sec) this week.

Any criteria violations at the fishway entrances are related to the failure of the PLC (Programmable Logic Circuit) for automated control. Without automated control, the FCRG (Fishway Control Regulating Gate) drifts closed causing the fishway entrance head to go out of criteria at the south shore entrances. Operators are manually controlling the FCRG and fish pumps to maintain head and depth criteria at fishway entrances. The loss of the fishway PLC also caused all weir gates to be placed in local control. This results in criteria violations if monitoring and adjustment does not occur as tailwater level fluctuates. To minimize this, SPE1 and SPE2 are placed on sill.

The replacement PLC for automated control of the fishway has been received. It is currently undergoing programming. The latest update on getting the automated system back in service is

February 2015. The operators have been instructed to conduct a physical inspection on night shift to replace the FPP inspection via data screen conducted normally on that shift.

Auxiliary Water Supply System: All AWS pumps were in service and operating through this report period.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 20.0 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 12% surface coverage.

STSs/VBSs: STSs were operated in cycle-run mode until raised for winter maintenance (all raised by the end of the 17th). STSs were inspected November 4, 5 and 6. All screens passed inspection.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel operated with 18 orifices open until dewatered on December 17 at 1430 hours.

Collection Facility: N/A.

Transport Summary: N/A.

River Conditions

Summer spill ended at 0000 hours on September 1. 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 (°F)*		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
31.9	25.1	0.0	0.0	42	41.5	5+	5+

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on November 3. Live fish included 1 prawn. Mortalities included l5 prawn and 90 shad.

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

Avian Activity: Bird counts are presently being done with ladder inspections.

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

Project: Little Goose
Biologist: Richard Weis
Dates: December 12 – 18, 2014

Turbine Operation

Turbine units 2, 4, 5 and 6 were available for most of this report period. Unit 3 was placed out of service on July 7 at 0700 hours for a planned six year overhaul. Unit 1 was placed out of service for its annual repair on December 1. Unit 6 was placed out of service on December 17 to pull fish screens. Soft constraint 1% peak efficiency criteria are in effect.

Adult Fish Passage Facility

Adult fishway inspections were performed on December 17, and 18.

Fish Ladder: Ladder exit differentials held steady at 0 ft. (criteria $\leq$ 0.5 ft.). Water depths over diffuser 13 weirs held steady at 1.2 feet (criteria 1.0-1.3 ft.). No differential was observed at the picketed leads (criteria $\leq$ 0.3 ft.). No debris was observed at the picketed leads or the ladder exit. 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 1.0 and 1.6 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.2 and 8.3 feet (criteria $\geq$ 8.0 ft). NPE weirs rested on sill and ranged between 6.7 and 7.1 feet (criteria $\geq$7.0 ft). NSE weirs are in manual and depths ranged between 6.2 and 7.2 feet (criteria $\geq$ 6.0 ft.). North powerhouse surface water velocity measured between 1.8 and 2.2 fps. Collection channel surface water velocity near north shore entrance ranged between 1.5 to 2.2 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: All fish pumps operated within criteria except Pump 3. Pump 3 tripped a breaker on December 16 and was restarted. This pump was off line for 40 minutes from 1820-1900 hours.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Estimated amounts of woody debris in the immediate forebay ranged between 100 and 300 sq ft.

Spillway Weir: The spillway weir was removed from service on August 4.

ESBS/VBS: ESBSs operated within criteria during this report period. All brushes operated as designed. Fish screens on units 1 and 3 were pulled on December 11. Fish screens on units 2, 5 and 6 were removed on December 16. Turbine units were not be used or were out of service. Monthly test of all ESBSs were performed on November 25. All screens met criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile system was operated with 18 open orifices.

Transportation Facility: The juvenile collection and transportation facility is dewatered and is in primary by-pass mode.

Transport Summary: Fish transportation system has ended for the season.

River Conditions

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
30.0	25.9	0	0	42.0	41.5	6.0+	6.0+

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were checked on December 18. No fish were found.

Invasive Species: No zebra mussels were observed on the substrate monitor on December 15.

Avian Activity: USDA-APHIS bird hazing ended on June 20.

Table 2. Tailrace counts of foraging piscivorous birds at Little Goose Dam.

Date*	Time (hours)	Gulls	Cormorants	Terns	Pelicans
December 12	---	---	---	---	---
December 13	---	---	---	---	---
December 14	---	---	---	---	---
December 15	---	---	---	---	---
December 16	---	---	---	---	---
December 17	---	---	---	---	---
December 18	---	---	---	---	---

*Observations not taken this week.

Gas Bubble Disease: WDFW Gas Bubble Trauma monitoring concluded July 28.

Research: The University of Idaho continues their adult salmonid and adult lamprey passage study.

Project: Lower Granite
Biologists: Elizabeth Holdren and Ches Brooks
Dates: December 12 – 18, 2014

Turbine Operation

Units are being operated within the soft constraint 1% operational criteria. Unit 1 was removed from service at 0716 hour on October 21 for annual maintenance. The return to service date for unit 1 is expected to be January 12, 2015 pending completion of fish screen slot closure work. Unit 2 was removed from service at 0612 hours on December 1 for annual maintenance.

Adult Fish Passage Facility

The fish ladder was inspected by Corps biologists on December 15, 16, and 17.

Fish Ladder: Fishway exit head differentials and depths over the weirs were in criteria (≤0.5' and 1.0-1.3', respectively) on all inspections. Picketed lead head differentials were in criteria (≤ 0.3') on all inspections.

Fishway Entrances and Collection Channel: NSE1 was out of criteria (criteria ≥7' or on sill) on all inspections with depth readings of 4.6', 4.5', and 4.9 feet. NSE2 was out of criteria (criteria ≥7' or on sill) on all inspections with depth readings of 5.8', 5.7', and 6.2 feet. North shore channel/tailwater head differentials were out of criteria (criteria 1'-2') with differential readings of 0.7', 0.8', and 0.7 feet. NSE2 has been out of service since 2011 and is suspended with a non-adjusting hoist system at an elevation of 630.0 feet. The gate requires a complete rehab and will remain out of service until funding is available. Entrance weir depths are being sacrificed in an attempt to maintain channel/tailwater head differential.

NPE1 and NPE2 weir gates were in depth or sill criteria (criteria ≥8' or on sill) on all inspections. While on sill the weir gate depth readings were 7.8' and 7.7 feet. North powerhouse channel/tailwater head differentials were in criteria (criteria 1'-2') on all inspections.

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

Collection channel velocity was out of criteria (criteria 1.5-4.0 fps) on all inspections. The daily average channel velocity readings were 1.2, 1.1, and 1.1 feet per second. Powerhouse electrical crew is looking into alternatives for velocity meter replacement.

Auxiliary Water Supply System: All AWS pumps were available for service. Pumps 1 and 3 were in operation and pump 2 was in standby mode.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Forebay debris varied during the week due to wind strength and direction.

ESBSs/VBSs: ESBS removals were completed on November 14.

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

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

Transport Summary: No fish transport is occurring.

River Conditions

No spill is occurring at this time. River conditions during the week are outlined in Table 1.

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
29.4	27.0	0.0	0.0	45.3	44.0	5.0+	5.0+

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers were inspected on November 25. No live lamprey were recovered. No lamprey mortalities or other fish species were recovered. The next inspections are scheduled for late December.

Invasive Species: No zebra/quagga mussels were observed at the monitoring station on December 16.

Avian Activity: Daily piscivorous bird counts concluded on November 13.

Adult Fish Trap Operations: The adult fish trap is dewatered.

Fish Salvage Operation: No fish salvages occurred during this report week.

Research: Onsite juvenile fish research has concluded for the year.