U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#43-2015

Project: McNary
Biologist: Bobby Johnson
Dates: December 18 - 24, 2015

Turbine Operation

McNary had all 14 units available for power generation this week. On November 1, the soft 1 percent constraint began. Turbine unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
3, 4 & 5	Dec 18	18.5 hours total.	Extended-length submersible bar screens (ESBSs) raised for winter maintenance.
1 & 2	Dec 19	11.2 hours total.	ESBSs raised for winter maintenance.
13 & 14	Dec 21	10.5 & 10.9 hours each.	Bonneville Power Administration (BPA) transmission line 6 outage.

Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on December 20, 21 and 22.

Fish Ladder Exits: Criteria at both exits are 1.0 to 1.3 feet for head over weir and 0.0 to 0.5 feet differential at the count stations. Both ladder exits met all criteria during measured inspections. Debris loads were minimal at both exits.

On December 18, the assistant biologist found the Washington ladder head over weir at 0.8 feet. The mechanics continue to install new handrail around the exit weirs. When working by a specific weir, the mechanics switched the weir to manual operation for safety reasons. The operators adjusted the exit as required for forebay elevation changes. This low reading occurred before the exit set points were adjusted.

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.

On December 20 at the Oregon ladder, NFEW2, SFEW1 and SFEW2 each measured 7.9 feet weir depth. On December 22, the north powerhouse pool differential measured 0.9 feet. Low tailwater elevation, the lack of supplemental water from juvenile system to the north pool, tailwater sensors calibration drifts and entrance weir adjustments when recording the data may have all contributed to these readings.

Collection channel surface velocities averaged 1.9 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 winter maintenance outage will be unaffected. The bypass functioned satisfactorily.

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

The juvenile facility is no longer supplying 450 cubic feet per second to the north powerhouse pool.

Juvenile Fish Passage Facility

On December 22, the fall bypass season concluded following the raising of all ESBSs and the dewatering of the juvenile channel for winter maintenance.

Forebay Debris/Gatewell Debris/Oil: The forebay debris load was light to minimal. The amount of new debris was also minimal.

No high trash rack differentials were recorded and no trash racks were cleaned. Trash rack differential measurements will continue into the winter maintenance season.

No problems were observed in the gatewell slots.

ESBS/Vertical Barrier Screen (VBSs): On December 18 and 19, ESBSs were raised for winter maintenance in units 1 through 5, completing screen removals. On December 20, the ESBSs were inspected. All screens were clean with all brush bars parked in the proper position. Fifteen juvenile lamprey mortalities were removed from the ESBSs along with numerous sticklebacks and juvenile shad. Ten of the lamprey were found in units 11 through 13. The lamprey mortalities were not recent.

No high VBS differentials were recorded and no screens were cleaned this week. On December 19, VBS differential monitoring concluded with ESBS removal. VBS rehabilitations continued.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: On December 22, at 0800 hours, the 42 orifices in use were closed for the winter maintenance season.

From 0900 to 1100 hours, evacuation of the upper emergency bypass channel followed. From 1240 to 1340 hours, fish were evacuated from the lower emergency bypass channel to tailwater. Approximately 30 adult steelhead, two steelhead smolts, three Chinook smolts, one adult sturgeon, 30 adult shad, 75 juvenile shad, 15 smallmouth bass and two walleye were observed. Mortalities included two adult shad, approximately 35 juvenile shad and one walleye.

Bypass Facility: Facility maintenance continued.

River Conditions

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

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
148.4	94.2	0.0	0.0	45.0	44.0	6.0	5.0

Other

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

Invasive Species: On December 20, zebra mussel station examinations revealed no problems.

Avian Activity: In the forebay observation zone, cormorants, grebes and gulls were occasionally noted. Gulls and cormorants were roosting on the rocks by the Washington shore boat dock, which is outside the forebay observation zone.

Gulls and cormorants were observed in the tailwater observation area, roosting on the navigation lock wing walls, on the Washington ladder, in the spill basin or around the powerhouse. They appear to be feeding in the powerhouse flow on juvenile shad.

Until December 22, gulls and cormorants were observed occasionally feeding near the emergency bypass outfall.

A large flock of gulls continued to move around in the general area. An occasional blue and night heron was noted on project.

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

Project: Ice Harbor
Biologists: Ken Fone
Dates: December 18 - 24, 2015

Turbine Operation

Unit 1 was out of service for annual maintenance from November 2 at 0417 hours to December 18 at 1350 hours. Unit 2 was out of service for STS removalss from 0719 hours to 1140 hours on December 18.

Adult Fish Passage Facility

Fish facility personnel inspected the adult fishways on December 21 and 22.

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 surfaces above the fish ladder exits were clear of debris and the bubblers were operating satisfactorily. The south shore and north shore picketed leads are raised since adult fish counting is done for the season.

Fishway Entrances and Collection Channel: The south shore entrance (SFE-1) depth and channel/tailwater differential were in criteria on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater differential were in criteria on all inspections. The north shore entrance (NSE-1) depth and channel/tailwater differential were in criteria. 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 on all inspections. The channel velocity criterion is 1.5-4.0 feet/second.

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

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of approximately 5 square yards of surface debris observed in the forebay. There was little to no surface debris coverage observed in the gatewells.

STSs/VBSs: Unit 1 STSs were removed for the season on November 4, since the unit remained out of service through December 15. Unit 6 and unit 5 STSs were removed on December 16, unit 4 and unit 3 STSs were removed on December 17, and unit 2 STSs were removed on the morning of December 18.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass system was unwatered for annual maintenance on the afternoon of December 18. Sixty one clipped adult steelhead, 17 unclipped adult steelhead, 7 clipped juvenile steelhead, and 3 channel catfish were recovered during the unwatering process and released at Hood Park in good condition.

Juvenile Fish Facility: The facility is unwatered for annual maintenance.

Fish Sampling: Fish sampling is done for the season.

Removable Spillway Weir (RSW): Mandated spill for fish passage began on April 3 and ended on August 31.

River Conditions

River conditions during the week are outlined in Table 1 below.

Table 1. River conditions at Ice Harbor Dam.

Daily Average River Flow (kcfs)		Daily Average Spill (kcfs)		Water Temperature* (^{o}F)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
30.0	18.8	0	0	47	43	12.0	8.8

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: The unit 1 cooling water strainer was inspected on December 1, the unit 4 strainer was inspected on December 9, the unit 5 strainer was inspected on December 16 , and the unit 6 strainer was inspected on three occasions this month (December 1, 16, and 17). There was a total of approximately 1,325 juvenile shad recovered (all mortalities).

Invasive Species: No new exotic species have been found.

Avian Activity: A relatively high number of cormorants, gulls, and pelicans were seen roosting on or near Eagle Island, and opportunistically foraging around the dam during the week. Fish facility personnel periodically used a laser light to scare the cormorants away from the dam and Eagle Island, and move them further downstream. Generally, efforts were successful when done under overcast skies near dawn or dusk.

Research: There is no on-site fish research actively occurring at this time.

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: December 18 - 24, 2015

Turbine Operation

The units are being operated within the soft constraint of the 1% peak efficiency criteria. Unit 1 was removed from service on December 10, 2014 for unit rehabilitation with an estimated return to service date of January 12, 2017. Unit 2 was removed from service at 0800 hours on November 9 for annual maintenance with an estimated returned to service on January 14, 2016.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on December 21, 22 and 23.

Fish Ladders: Fishway exit head differentials and depth 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, both gate depth readings ranged from 7.5 to 7.8 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 1, 2, and 3 were operated throughout this period.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 14 square yards of forebay debris observed during this period. Gatewell debris readings are not available as STS are raised. No problems observed in gatewells.

STSs/VBSs: STSs were operated in cycle mode until removed for winter maintenance (all raised by the end of the 17th). STS inspections were conducted November 3 and 4 with all screens found in good operating condition.

Orifices, Collection Channel, Dewatering Structure and Flume: The collection channel was dewatered for winter maintenance on December 17 at 1315 hours.

Collection Facility: The JFF (Juvenile Fish Facility) was dewatered for winter maintenance on October 6.

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

River Conditions

No spill occurred during this report period. 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
29.3	21.3	0.0	0.0	45.1	44.1	4.6	4.4

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were cleaned on December 2. Biological content is unknown as fish facility personnel were not contacted to coordinate this joint PM (Periodic Maintenance).

Invasive Species: No zebra mussels were observed at the monitoring stations on December 7.

Avian Activity: Daily tailrace counts ceased at the end of the collection season on October 1. The bird sprinklers at the outfall pipe exit are dewatered for the winter.

Table 2. Lower Monumental Tailrace Counts of Foraging Piscivorous Birds.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
N/A					

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

Project: Little Goose
Biologist: Richard Weis
Dates: December 18 - 24, 2015

Turbine Operation

All turbine units were available for service throughout this report period except units 1 and 4. Unit 1 was returned to service on December 18 at 1215 hours. Unit 1 was again placed out of service for an excitation breaker trip on December 21 and was returned to service at 1053 hours the same day. Unit 4 was removed from service for digital governor installation. Soft 1% peak efficiency constraint criteria have been in effect since November 1.

Adult Fish Passage Facility

Adult fishway inspections were performed on December 21, 22 and 23.

Fish Ladder: The ladder exit head differentials ranged between 0.2 and 0.3 feet (criteria $\leq$ 0.5 ft.). Water depths over the ladder weirs ranged between 1.2 and 1.3 feet (criteria 1.0-1.3 ft.) and picketed lead head differentials ranged between 0 and 0.1 feet (criteria $\leq$ 0.3 ft.). The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily.

Fishway Entrances and Collection Channel: The adult fishway system is mostly in manual mode. North shore adult fish entrance weirs are in manual mode due to failure of the slack cable sensors. North powerhouse weirs are also in manual mode as the fishway computer is raising the weirs off sill and out of criteria. Channel to tailwater head differentials ranged between 0.8 and 1.4 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.3 and 8.4 feet (criteria $\geq$ 8.0 ft). NPE weir depths ranged between 6.2 and 6.3 feet and both weirs were on sill (criteria $\geq$7.0 ft. or on sill). NSE weir depths ranged between 6.7 and 6.8 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured at the North powerhouse ranged between 1.8 and 2.1 fps (criteria 1.5 to 4.0 fps). The monthly water velocity measured at the north powerhouse using the Rickly velocity equipment measured 1 foot from bottom, mid depth and surface averaged 3.5 fps.

Auxiliary Water Supply System: Fish pumps 2 and 3 operated as designed. Fish pump 1 gear box was rebuilt and is still waiting on return to service.

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 ranged between 1 and 120 square feet for the week.

Spillway Weir: The spillway weir was removed for the season on June 18.

ESBS/VBS: All ESBSs are in their raised positions. Drawdowns were not performed this week. ESBSs were removed from all units on December 16 and 17.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile bypass system was dewatered on December 21 and all orifices are closed.

Transportation Facility: The JFF (Juvenile Fish Facility) collection season ended with the last truck departure taking place October 31. GBT (Gas Bubble Trauma) sampling ended for the season.

Transport Summary: The juvenile collection system was dewatered for the season on December 21.

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
29.1	19.8	0	0	41.6	41.5	6.0+	5.9

*Ladder temperature.

Other

Inline Cooling Water Strainers: All cooling water strainers were checked on December 21. No fish were seen.

Invasive Species: The zebra mussel substrate monitor was inspected on December 3. No zebra mussels were detected.

Avian Activity: Bird hazing ended on June 16. See the chart below for the numbers observed. Bird counting has ended for the season and will resume in the spring.

Table 2. Daily maximum tailrace piscivorous bird counts at Little Goose Dam*.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
Dec 18	None	0	0	0	0
Dec 19	None	0	0	0	0
Dec 20	None	0	0	0	0
Dec 21	None	0	0	0	0
Dec 22	None	0	0	0	0
Dec 23	None	0	0	0	0
Dec 24	None	0	0	0	0

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

Scroll Case Temperature: Little Goose Dam has only one temperature probe on the Scroll Case in unit 1 only. The temperature ranged between 41 and 49.5 degrees Fahrenheit.

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

Project: Lower Granite
Biologists: Elizabeth Holdren, Robert (JR) Horal
Dates: December 18 - 24, 2015

Turbine Operation

Units are operating within the soft constraint 1% peak efficiency criteria.

Adult Fish Passage Facility

The adult fish ladder was inspected by Corps Biologists on December 28, 29, and 30.

Fish Ladder: Fish ladder exit head differential and depth over the weirs were in criteria (≤0.5' and 1.0-1.3', respectively). Picketed lead head differential was in criteria (≤ 0.3').

Fishway Entrances and Collection Channel: SSE1 and SSE2 weir gates were in 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. 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 all inspections with gate depth reading of 4.9, 4.9, and 5.4 feet. NSE2 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 inspections.

Collection channel velocity was out of criteria (criteria 1.5-4.0 fps) on all inspections with readings ranging from 0.9 – 0.8 fps and an average of 0.9 fps. Alternative methods of measuring collection channel velocity are being investigated as part of the fish ladder control system upgrade during the 2015-2016 winter maintenance outage.

Auxiliary Water Supply System: The fish ladder is in two pump operation with AWS pumps 1 and 2 operating, and pump 3 is in standby mode.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Forebay debris was minimal. No oil was reported in gatewell slots.

ESBSs/VBSs: ESBSs are undergoing winter maintenance.

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

Collection Facility: The facility is in winter maintenance mode.

Transport Summary: Juvenile fish transport has ended for the season.

River Conditions

No spill is occurring at this time. 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
23.7	19.6	0.0	0.0	40.0	40.0	5.0+	4.7

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers inspections were last inspected on December 21. Six juvenile lamprey mortalities were recovered from units 2 and 5.

Invasive Species: No evidence of zebra/quagga mussel was observed December 1.

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

Fish Rescue Operation: No fish rescues occurred this week.

Research: No onsite research is taking place at this time.