U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#05-2016

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: March 25 - 31, 2016

Turbine Operation

McNary had available 12 to 14 units (out of 14 total units) for power generation this week. Turbine unit outages are recorded in Table 1 below. The hard 1 percent peak efficiency constraint criteria will begin April 1.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
9 & 10	Mar 24–31	About 7 days.	Bus connection related to station service upgrades contract.
11 thru 14	Mar 28	4.7 hours total.	Trash racks cleaned.
11, 6 thru 8	Mar 29	5.9 hours total.	Trash racks cleaned.
2 thru 5	Mar 30	8.8 hours total.	Trash racks cleaned.
1	Mar 31	2.1 hours.	Trash racks cleaned.

Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on March 28, 30 and 31. Fisheries technicians monitored the ladders as shifts allowed. Picketed leads at the exits were lowered on March 31. Adult fish counts will resume April 1.

During system tests on March 28, a brief power outage occurred at the Washington ladder and the passive integrated transponder (PIT) station. Normal operations resumed without incident following the outage. On March 30, lamprey passage stilts were installed on the new Oregon exit picketed leads.

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 both exits.

At the Washington exit, all criteria were met during measured inspections. The regulating weir tripped an alarm on March 30. The alarm was reset and the set point was adjusted.

At the Oregon exit, the regulating and tilting weir set points were adjusted on March 28. The head over weir measured 0.9 feet on March 31 just after the picketed leads had been installed.

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 south powerhouse entrance, weirs SFEW1 and SEFW2 measured 7.8 to 7.9 feet in depth on March 28 and 30. Higher tailwater elevations possibly contributed to these readings.

All other Oregon ladder inspection points were in criteria.

Collection channel surface velocities averaged 1.6 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 continues to function 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 returned to service on March 29, supplying 450 cubic feet per second (cfs) to the north powerhouse pool.

Juvenile Fish Passage Facility

The juvenile system was returned to service on March 29, operating in primary bypass mode. The first day of secondary bypass will be April 6.

Forebay Debris/Gatewell Debris/Oil: The forebay debris load remained heavy. Trash rack cleaning removed some floating debris.

No high trash rack differential measurements were recorded this week. Trash rack cleaning for all turbine units occurred from March 28 through 31. There were 16.2 ten-yard truckloads of debris removed, consisting of tumbleweeds, woody material and two large logs. No fish were observed.

No problems were observed in the gatewell slots.

Extended-length submersible bar screens (ESBSs)/Vertical Barrier Screen (VBSs): All ESBSs are raised and winter maintenance continues. ESBS installations will occur between April 5 and 15.

VBS differential monitoring will resume with ESBS installations. VBS rehabilitations continued.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The system was directly "watered up" into primary bypass mode on March 29 from 0730 to 1300 hours. Forty two orifices were in use. During trash rack cleaning, orifices in the affected slots were closed, with makeup water coming from orifices in adjacent slots. Orifice valve operator rehabilitations began.

All systems functioned satisfactory in automatic mode.

Bypass Facility: Primary bypass began on March 29 along with shift work and 24/7 monitoring of the juvenile channel.

The sample tanks supply line diffusers were cleaned. The raceway 2 back flush valve actuator was repaired. New doors were installed on the wet lab cabinets.

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.

Spill occurred on March 31 for top spillway weir (TSW) testing. Tests revealed that the new hoist stands have two issues. First, they are misaligned, which does not allow the hoist to raise the TSW in a straight line. Second, the stand structure is such that they do not allow the TSW to be fully raised out of the water. District and project personnel are examining alternatives to resolve these problems.

Spillway crane and hoist preparations continued. The spill gate in bay 21 was returned to normal configuration on March 28.

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
210.8	181.6	6.9	0.0	46.3	44.0	5.5	4.4

Other

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

Invasive Species: Mussel station examinations on March 30 revealed no problems.

Avian Activity: A few gulls, grebes, pelicans and cormorants were observed. Zone counts will begin on April 1. United States Department of Agriculture – Animal and Plant Health Inspection Service – Wildlife Services (USDA–APHIS–WS) personnel will begin bird hazing on April 3.

Two leaks in the bypass outfall sprinklers supply line were repaired. Sprinkler configurations will be examined once birds arrive.

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

Project: Ice Harbor
Biologist: Ken Fone
Dates: March 25 - 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 is being replaced to fix the leak. Units were taken out of service one at a time to install STSs on March 28 and 29.

Units are being operated within the 1% peak efficiency range (soft constraint).

The water in the area between the unit 5 maintenance bulkhead and head gate was released into unit 5 scroll case on March 30. Afterwards, a total of 34 juvenile chinook and 1 juvenile steelhead were recovered from the scroll case and released to the river.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on March 28, 29, and 30.

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 south and north shore picketed leads were installed on March 31 in preparation for the seasonal start of adult fish counting on April 1.

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, except for a depth of 7.8' on March 29. The north shore entrance (NSE-1) 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 the three north shore AWS pumps were operated during 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 approximately 20 square yards of debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 20%. Oil sheens were observed in the unit 5 gatewell slots during the week and oil absorbent pads remain deployed in the slots. The sheens were residual oil from the unit 5 blade packing oil leak. The maintenance bulkhead is installed in gatewell slot 5B and the slot has been unwatered to reduce the water leakage into unit 5.

STSs/VBSs: The STSs were installed on March 28 and 29, except for the STS in slot 5B. The STSs are operating in cyclic run mode.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass was "watered up" and 20 orifices were opened on March 24. The lights for orifices 1CN and 2AN were found burnt out on March 29. Those orifices were closed and orifices 1CS and 2AS were opened. The alternative orifices will remain opened until the lights are replaced.

Juvenile Fish Facility: The fish facility raw water supply pipes were "watered up" on March 28.

Fish Sampling: Sampling operations are scheduled to begin the week of 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
72.5	60.3	0.0	0.0	46.0	45.0	5.8	5.0

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Monthly turbine cooling water strainer inspections occurred on March 28 and 29. A total of 23 juvenile lamprey and 1 Siberian prawn (all mortalities) were found.

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 25 - 31, 2016

Turbine Operation

Turbine unit operations will change to hard constraint 1% peak efficiency criteria on April 1. 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 STS deployments on March 30 and 31. Unit 2 was out of service from 1635 to 1738 hours on March 31 due to start up failure.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on March 28, 29, 30 and 31.

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 reading were 7.5, 6.8 and 7.3 feet respectively. 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 with the exception of March 29 with a reading of 7.7 feet. The powerhouse operator was informed and discrepancy was corrected by placing the system in automatic mode. 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 remain 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 358 square yards of forebay debris observed during this period. No oil was observed in the gatewells.

STSs/VBSs: The STSs were deployed on March 30 and 31. Previously, STSs were raised for winter maintenance. The STSs were inspected via rotation on deck on March 17.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel was "watered up" on March 23 using 14 orifices. On March 31 at 1635 hours, the remaining gatewell orifice requirements were met and presently 18 orifices are open. On March 30, Anchor QEA biologists noticed low flow in orifice 2C12. The powerhouse operator was informed.

Collection Facility: The facility is "watered up" and in testing mode.

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

River Conditions

No spill occurred during this report period. Routine spill in support of fish passage begins April 3. 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
74.9	56.6	0.0	0.0	46.8	44.2	3.6	2.8

*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 others (all juvenile shad).

Invasive Species: No zebra mussels were observed during monitoring station inspections 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 25 - 31, 2016

Turbine Operation

All turbine units were available for service throughout this report period. Soft 1% peak efficiency constraint criteria are in effect.

Adult Fish Passage Facility

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

Adult fishway inspections were performed on March 28, 29 and 30.

Fish Ladder: The ladder exit head differentials held steady at 0.0 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 lead differentials held steady at 0.0 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: Channel to tailwater head differentials ranged between 1.0 and 1.7 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.1 and 8.3 feet (criteria $\geq$ 8.0 ft). NPE weir depths ranged between 7.1 and 7.5 feet (criteria $\geq$7.0 ft. or on sill). NSE weir depths ranged between 6.1 to 6.3 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured at the North powerhouse ranged between 1.6 and 1.8 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: Fish pump 1 is still waiting to be installed. Fish pumps 2 and 3 were shut down on March 18 for one hour due to high temperature and low cooling water flow. The JFF staff was not notified. Presently fish pump 2 and 3 are running. Water velocity measurements at the North Powerhouse using the Rickly velocity equipment was not conducted 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 accumulations in the immediate forebay was estimated between 4,200 to 5,000 square feet.

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: All ESBSs are deployed. Initial drawdowns measurement have not yet been performed.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile bypass system is presently running with 18 open orifices in primary by-pass mode.

Transportation Facility: The transportation facility was "watered up" on March 22. A leak was found in the secondary emergency release system just downstream from the 18 inch valve. This leak is being assessed as is the path forward regarding repairs and changes in facility operations.

Transport Summary: Fish transport is slated to 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
69.6	49.3	0.0	0.0	48.5	47.3	4.0	2.8

*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 late April.

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

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

Project: Lower Granite
Biologists: Elizabeth Holdren, Robert Horal
Dates: March 18 - 24, 2016

Turbine Operation

All units are being operated within the soft constraint 1% peak efficiency criteria. Unit 5 was out of service March 28 from 1226 to 1645 hours for field ground testing. Unit 2 was out of service on March 28 from 0759 to 0826 hours, March 29 from 0712 to 0736 hours, and on March 31 from 0703 to 0727 hours for gatewell dipping. Unit 3 was out of service on March 28 from 0903 to 0949 hours, March 29 from 0747 to 0826 hours, and on March 31 from 0750 to 0823 hours for gatewell dipping.

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. The contractor installed a new program (that is currently being evaluated) on March 28. 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 hand mode until programmers return to make adjustments. Adult fish facilities were inspected by Corps or Anchor QEA biologists on March 25, 26, 27, 30, and 31.

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 1.8 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 with the exception of a 7.9 feet reading on March 30. This out of criteria reading is 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 with the exception of a 7.9 feet reading March 27. This out of criteria reading is related to the fish ladder control system issues. NPE1 and NPE2 were in sill criteria March 30, and 31 with reading of 7.9' and 7.4 feet. North powerhouse channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections.

NSE1 was in 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 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: No fish were observed in the temperature control structure this week.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: An average of about 320.0 square yards of debris was observed in the forebay this week. No oil was observed in the gatewell slots.

ESBSs/VBSs: ESBSs were installed from March 21 to March 23.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: The collection channel is in operations with 18 orifices open. Orifices are being cycled every three hours.

Collection Facility: The collection facility was watered up March 21 at 1220 hours and is operating in secondary bypass mode. Condition sampling began March 25 at 0700 hours at a 5.0% sample rate with the first sample being worked up on March 26.

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

River Conditions

Spill occurred March 29 in support of emergency backup generator load testing. Routine Spring spill is scheduled to begin April 3 at 1201 hours. 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
72.5	50.5	0.03	0.0	46.0	45.9	3.8	2.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers were inspected March 28. No live lamprey were recovered. Mortalities included 80 juvenile lamprey, 10 juvenile salmonids, and 2 unidentified fry.

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

Avian Activity: Piscivorous bird counts began March 26 with observations being taken from the top of the upstream and downstream navigation lock. Avian hazing is scheduled to begin April 1. Daily piscivorous bird counts are summarized in Table 2.

Table 2. Daily piscivorous bird counts at Lower Granite Dam.

Date	Time (hours)	Gulls	Cormorants	Terns
March 25	---	---	---	---
March 26	1400	12	0	0
March 27	0800	20	6	0
March 28	1307	35	14	0
March 29	1515	63	11	0
March 30	1330	5	0	0
March 31	1400	21	14	0

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

Fish Rescue Operation: No fish rescues occurred this week.

Gatewell Dipping for John Day Screen investigation of unit 2 slot A and unit 3 slot A: Unit 2 and 3 gatewell slots A were dipped March 28, 29, and 31 to compare smolt condition in Unit 2 with a standard LWG screen in unit 2 slot A and JDA screen in unit 3 slot A. Both units were operated at upper end of the 1% efficiency from 1900-0700 hours prior to dipping slots. Average MWH for 24 hours prior to dipping was 124.3 MWH for unit 2 and 125.3 MWH for unit 3. A total of 151 fish were examined from unit 2 gatewell slot A with 1 fish descaled and a total of 71 fish were examined from unit 3 gatewell slot A with no fish descaled.

Research

Idaho Fish and Game (IDFG) Genetic Stock Identification: This study aims to enumerate and characterize natural production of yearling Chinook and juvenile steelhead above LWG with regards to age composition and genetic stock profiles. IDFG will sample Monday through Friday through mid-June with a goal of collecting 2,000-5,000 genetic samples from yearling Chinook and juvenile steelhead.

Nez Perce Tribe (NPT)/U. of Idaho (UI)/Columbia River Intertribal Fisheries Commission (CRITFC) – Kelt Study: NPT began steelhead kelt collection March 31. This research project investigates steelhead kelt physiology and endocrinology to evaluate the feasibility and success of rehabilitating strategies. NPT will transport up to 150 kelts to Dworshak National Fish Hatchery as part of this study.

National Marine Fisheries Service (NMFS)-Monitoring the Migrations of Wild Snake River Spring/Summer Chinook: This study is monitoring the migration behavior and survival of wild spring/summer Chinook salmon. The specific goals are to characterize the migration timing and estimate parr-to-smolt survival to LWG of wild Chinook populations as they migrate from their natal rearing areas and determine migration patterns and what environmental factors influence those patterns. Fish were PIT-tagged during the summer of 2015 in natal streams and are diverted to the Sort-By-Code tanks at LWG.