U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#27-2016

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: August 26 – September 1, 2016

Turbine Operation

McNary turbine unit outages are recorded in Table 1 below. The saw tooth unit priority for warm water temperature abatement concluded on September 1 at 0001 hours.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
1	Jul 25 to Sep 23	About 2 months.	Nine year over haul.
4	Aug 29 to Sep 1	3.4 days.	Annual maintenance.
3	Aug 29	7.1 hours.	Bonneville Power Administration (BPA) substation maintenance.
5 thru 8	Aug 30	8.1 hours.	BPA substation maintenance.
2 and 6 - 10	Aug 31	10.7 hours total.	Thrust bearing oil level instrumentation calibration.
8, 11 & 12	Sep 1	9.0 hours total.	Thrust bearing oil level instrumentation calibration.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on August 26, 28 and 31.

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. The picketed leads were cleaned as required, including weekends.

At the Washington exit, debris loads were minimal. The regulating weir tripped an alarm and was reset on August 26 and 28.

At the Oregon exit, debris loads were minimal to light. Along the shoreline, debris loads were minimal to moderate. The count station differential measured 0.6 feet on August 30 in the early

morning. The general maintenance staff cleaned the picketed leads as soon as their shift began. The regulating and tilting weirs set points were adjusted on August 28. The regulating weir set was also adjusted on August 31. Weir 338 will remain out of service until the winter maintenance season. The exit program is regulating the weirs satisfactorily and is maintaining criteria. The fisheries staff will continue to monitor the exit frequently.

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 ladder, north powerhouse entrances, NFEW2 and NFEW3 measured 7.4 to 7.5 feet in depth all week. South powerhouse entrances, SFEW1 and SFEW2 measured 7.8 to 7.9 feet in depth on August 28 and 31. A possible explanation for these measurements is low tailwater elevation. Pool differentials remained in criteria. The south pool elevation sensor was calibrated on September 1.

The Oregon ladder collection channel surface velocities averaged 1.6 fps.

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 is scheduled for completion in October. The bypass continues to function satisfactorily.

Two of the three Oregon ladder fish pumps operated satisfactorily with several interruptions in service this week as recorded in Table 2 below.

Table 2. Fish Pump Outages

Pump	Date	Length	Time	Reason
1 & 3	Aug 26	15 minutes.	1030 to 1045 hours.	Station service upgrade contract bus switch.
1 & 3	Aug 29	23 minutes.	1415 to 1438 hours.	Station service upgrade contract.
1 & 3	Aug 31	5 minutes.	1335 to 1340 hours.	Bus switch.
1 & 3	Sep 1	7 minutes.	1313 to 1320 hours.	Attempt to isolate direct current (DC) ground issue.
1 & 3	Sep 1	16 minutes.	1839 to 1855 hours.	Attempt to isolate DC ground issue.
1 & 3	Sep 1 to 2	67 minutes.	2320 to 0027 hours.	Attempt to isolate DC ground issue.

Both pumps operated with blade angles of 24 degrees. Fish pump 2 is currently under contract for major overhaul with completion scheduled for mid-November.

The juvenile facility continued to supply 450 cubic feet per second (cfs) to the north powerhouse pool.

Juvenile Fish Passage Facility

Secondary bypass occurred on August 26, 28, 30 and September 1. This week, 36 juvenile lamprey and 72 smolts were bypassed.

Forebay Debris/Gatewell Debris/Oil: Forebay debris loads were minimal to light at the powerhouse and spillway. A small amount of woody material moved to the powerhouse after the spillway was closed on September 1 at 0001 hours. Incoming debris loads were light. Debris predominately consisted of aquatic vegetation, which was driven to the Oregon shore by northeast winds.

No high trash rack differential measurements were recorded and no trash racks were cleaned.

No problems were observed in the gatewell slots.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs): ESBSs are deployed in all units. ESBS camera inspections did not occur due to camera failure on August 30. The pan and tilt drives on the main and backup cameras were repaired on September 1. The ESBSs in slots 6B, 6C and 12C remained in timer mode.

The ESBS cleaning brush in slot 12A was observed not completing its cycle on August 31 and September 1. The brush cycle was switched from automatic to timer mode on September 1.

VBS differential monitoring revealed no screens out of criteria. Ten VBSs were cleaned on August 31 and September 1 to coordinate with the timing of the spillway closure. Fresh water sponge was washed off the backside of several VBSs during the cleaning. VBS rehabilitations continued with new mesh being installed on torn VBS sections.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: Forty-two orifices were in use. During VBS cleaning, orifices in the affected slots were closed, with makeup water coming from orifices in adjacent slots.

All dewatering and cleaning systems operated satisfactory when in automatic mode. The fisheries staff continued to monitor the side screen cleaning brush drive gearbox. New gearbox seals should arrive in about three weeks. The gearbox is expected to function satisfactorily until then.

The fisheries staff monitored the channel from August 31 at 2200 hours to September 1 at 0600 hours for debris load changes during the spillway closure. No problems were seen other than a slight increase in aquatic vegetation. The side and rectangular screen cleaning brushes cycle times were set at 120 (previously 180) and 60 (previously 90) minutes, respectively, from August 31 to September 2 due to the aquatic vegetation.

Bypass Facility: All systems have been functioning satisfactory. An air line fitting was replaced on the B side sample gate on August 31. Sampling was not affected. A small stick was removed

from the B side secondary bypass line at the second downstream access hatch on August 31. An increase in aquatic vegetation at the separator occurred after the spillway closure.

River Conditions

River condition data during the week was provided by the smolt monitoring staff and is outlined in Table 3 below. Water clarity data was provided by the control room. The data period runs from 0700 to 0700 hours each day. Flows and spill are recorded in one-thousand cubic feet per second. Temperatures are recorded in degrees Fahrenheit (F).

Table 3. River Conditions at McNary Dam.

Daily Average River Flow		Daily Average Spill		Water Temperature		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
145.2	102.1	72.8	39.9	70.8	70.0	6.0	6.0

Routine summer spill in support of fish passage concluded September 1 at 0001 hours.

Temperature monitoring concluded on August 31. The contractor, Anchor QEA, will document temperature data in a separate yearend report.

Other

Inline Cooling Water Strainers: Cooling water strainer examinations are scheduled to occur on September 6.

Invasive Species: Mussel station examinations will occur in late September.

Avian Activity: Avian counts are recorded in Table 4 below.

Gull numbers fluctuated with most gulls roosting around or feeding in the spill zone. Cormorant numbers remained low as they continued to feed in the spill zone. Both species appear to be feeding on juvenile shad. The gulls moved from the spillway to the powerhouse when the spillway closed. No Caspian terns were observed. Pelican numbers remained fairly low as they were observed in the spill zone. No grebes were observed on project. Ospreys and kingfishers were noted at times. Gulls and cormorants continued to roost on the rocks by the Washington shore boat dock, which is outside the forebay zone.

On August 31, at 1100 hours, the bypass outfall sprinkler system returned to service after oil was added to the supply pump. The gull distress calls were also examined this week and appeared to be functioning satisfactory.

Table 4. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
Aug 26	Forebay	0	0	0	0	0
	Spill	10	2	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 27	Forebay	2	0	0	0	0
	Spill	82	0	0	2	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 28	Forebay	0	0	0	0	0
	Spill	59	9	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 29	Forebay	0	0	0	0	0
	Spill	47	13	0	2	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 30	Forebay	1	0	0	0	0
	Spill	5	1	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 31	Forebay	2	0	0	0	0
	Spill	17	2	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Sep 1	Forebay	0	0	0	0	0
	Spill	0	1	0	1	0
	Powerhouse	7	0	0	0	0
	Outfall	0	0	0	0	0

Fish Salvage/Rescue**:** No new mortalities were observed in the unit 1 tailwater bulkhead slots this week. The unit's two bulkhead slots are being examined daily. There may be more live sturgeon in the slots than previously estimated but an accurate count is difficult to make.

Research

GBT: Gas bubble trauma (GBT) monitoring did not occur this week due to low smolt numbers. Monitoring also concluded with the spillway closure on September 1.

Project: Ice Harbor
Biologist: Ken Fone
Dates: August 26 – September 1, 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. Unit 2 was taken out of service on April 25 at 0606 hours for runner replacement. Unit 3 was taken out of service on August 29 at 1031 hours for annual maintenance.

Units 1 and 6 were operated during the week, and both met 1% peak efficiency criteria (hard constraint).

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on August 30, 31 and September 1.

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.

Fishway Entrances and Collection Channel: The south shore entrance (SFE-1) depth and channel/tailwater head differential were in criteria on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater head differential were in criteria on all inspections. The north shore entrance (NSE-1) depth and channel/tailwater head differential were in criteria on all inspections. Fishway entrance criteria are 8 feet depth or greater, or on sill. Channel/tailwater differential criteria are 1 – 2 feet.

The south shore channel velocity was in criteria. The channel velocity criterion is 1.5-4.0 feet per second.

Auxiliary Water Supply (AWS) System: Two of the three north shore AWS pumps were in operation during the week. Five of the eight south shore AWS pumps were in operation.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was no debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 5%. Slot 2C was un-watered on July 6 to facilitate the unit 2 head gate sill plate repair.

STSs/VBSs: The STSs are in cycle-run mode, as the average fork length of subyearling Chinook is over 120 mm at the Lower Monumental Juvenile Fish Facility. The STS for slot 5B has not yet been installed to facilitate work on unit 5. Unit 2 STSs are raised and stored in their gatewell slots, since unit 2 will not be operated for the rest of the year. Units 3, 4, and 6 STSs were inspected on August 16 and 18, with no problems found.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass operated with 20 opened orifices. Orifices were routinely cycled and back-flushed once per day.

Juvenile Fish Facility: The juvenile fish facility is operating in bypass mode.

Fish Sampling: Sampling is done for the season.

Removable Spillway Weir (RSW): Spill in support of fish passage began April 3 at midnight and ended September 1 at midnight.

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
24.8	19.9	14.0	0.0	69.0	69.0	7.3	6.9

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections occurred on August 16 and 18. A total of 23 juvenile shad and 1 Siberian prawn (all mortalities) were recovered.

Invasive Species: No new exotic species have been found.

Avian Activity: There were a low number of piscivorous birds observed around the project. Pelicans were observed roosting on Eagle Island and foraging downstream of the spillway, across from the coffer cells.

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

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: August 26 – September 1, 2016

Turbine Operation

The units are being operated within the hard constraint 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 4 was taken out of service at 0730 hours on August 8 for annual maintenance with an estimated return to service date of September 6.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on August 26, 27, 28 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 with the exception of the North ladder on August 26 where readings read 0.5 feet. The lower picketed lead was found heavily covered with fibrous algae and cleaned by fish facility personnel.

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

SPE1 and SPE2 weir gates were in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, readings were 5.4, 5.8, 5.8 and 5.7 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, readings were 5.8, 6.3, 6.2 and 6.4 feet.

SSE2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head was in criteria (1'-2') on all inspections.

Auxiliary Water Supply System: AWS pumps 2 and 3 were operated throughout this period. Pump 1 was out of service throughout this period due to a bushing problem. This pump will be replaced with the spare pump as time permits.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 0 square yard of forebay debris observed during this period. Gatewell debris ranged from 0 - 10% surface coverage. No oil problems were observed in the gatewells.

STSs/VBSs: STSs were operated in cycle-run mode throughout this report period. STS inspections were conducted August 9 and 10 with all screens found in good operating condition.

Orifices, Collection Channel, Dewatering Structure, and Flume: The collection channel was operated with 19 opened orifices.

Collection Facility: No problems occurred this week.

Transport Summary: Every-other-day truck transport is in progress and scheduled to continue through 0700 hours on September 30.

River Conditions

Summer spill operations were initiated at 0001 hours on June 21 and ended at 2400 hours on August 31. 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
23.1	19.1	9.0	0.0	68.5	68.0	5.0	3.9

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected August 2. There were no live fish recovered. Mortalities included 4 Siberian prawns and 6 American shad.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on August 1.

Avian Activity: Daily tailrace counts of feeding piscivorous birds are summarized in Table 2 below. Gulls were the dominant species observed during inspections this week. Conditions met the standard from the avian action plan through this time period. Hazing ended on June 2.

Table 2. Tailrace counts of foraging piscivorous birds at Lower Monumental Dam.

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
August 26	1100	8	0	0	0	0
August 27	1100	27	0	0	0	0
August 28	1100	8	2	0	0	0
August 29	1105	2	1	0	0	0
August 20	1100	2	2	0	0	0
August 31	1100	8	2	0	0	0
September 1	1100	0	4	0	0	0

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

Project: Little Goose
Biologist: Richard Weis
Dates: August 26 – September 1, 2016

Turbine Operation

All turbine units were available for service except units 2 and 4. Unit 2 was placed out of service from 0702 ours until 1449 hours on August 30 to remove FGE study equipment. Unit 4 was placed out of service for its 6-year overhaul on August 15. No 1% violations to report.

Adult Fish Passage Facility

The Fishway Control System software was updated by RJS construction and returned to automatic operation on August 9. All weirs were manually adjusted and returned to automatic mode to determine functionality of the new software. System is operating sufficiently, but future calibration and maintenance still need to be performed.

Adult fishway inspections were performed on August 28 and September 1.

Fish Ladder: The ladder exit head differentials and water depth over weirs maintained criteria ($\leq$ 0.5 ft. and 1.0-1.3 ft., respectively) and picketed lead differentials held at 0.0 feet (criteria $\leq$ 0.3 ft.). The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily. Emergency cooling water pumps failed on August 29 at 0320 hours and were returned to service August 30 at 1659 hours. The emergency cooling pumps continued to operate in the adult ladder exit for the remainder of the reporting week.

Fishway Entrances and Collection Channel: Channel to tailwater head differentials maintained criteria on all inspections (1.0 to 2.0 ft.). SSE weir depths stayed in criteria ($\geq$ 8.0 ft.) on all inspections, ranging between 8.0 and 8.2 feet. NPE weir depths ranged between 5.0 and 6.1 feet (criteria $\geq$7.0 ft.) and were on sill. NSE weir depths ranged between 4.5 to 5.0 feet (criteria $\geq$ 6.0 ft.) and were on sill. Collection channel surface water velocity measured at the north powerhouse ranged between 1.8 and 2.2 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: Fish pump 1 was returned to service on August 02. The fish ladder is now operating on three pumps. The average water velocity (bottom, middle, top) of the adult channel at the NPE was 2.6 fps on August 22.

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 continues to be void of debris.

Spillway Weir: The TSW was removed on July 11.

ESBS/VBS: Electrical ESBS brush tests were performed on August 22. Drawdowns were performed on unit 1 on August 13. All met criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume: The gear box for the weirs at the primary dewatering structure was removed from service after an oil leak was discovered, stopped and the resulting residue cleaned. The weirs will remain turned off until the repair is complete. The juvenile bypass system is presently running with 21 open orifices. Orifices are cycled every 24 hours.

Collection Facility: Fish collection and sampling is occurring every day at the JFF (Juvenile Fish Facility). Fish transportation by truck occurs on even-numbered days in September (i.e.: every other day). Barge transport ended with the last barge departure on August 15.

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 1,020 fish were collected. The descaling and mortality rates were 0.4% and 0.3% respectively. This weekly report period saw 11 adult lamprey removed from the raceways or sample and released one mile above the Dam at Little Goose Landing.

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
22.4	19.7	7.3	0.0	67.9	67.4	6.0	3.6

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers on all units were last inspected on August 22. No fish were seen.

Invasive Species: The zebra mussel substrate monitor was inspected on August 24. No mussels were seen.

Avian Activity: USDA Bird hazing ended on June 25. See the chart below for USACE counts.

Table 2. Daily Avian Counts at Little Goose Dam, August 26 – September 1, 2016.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
August 26	0930	6	6	0	0
August 27	0800	15	9	0	0
August 28	1200	20	22	0	0
August 29	1315	25	22	0	0
August 30	1000	3	13	0	0
August 31	1000	10	11	0	0
September 1	1130	20	10	0	0

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

Siberian Prawn: Siberian prawns continue to be collected at the Juvenile Fish Facility. Prawns are humanely euthanized by Oregon Department of Fish and Wildlife and Anchor QEA, frozen and properly disposed of in a landfill. There were 5,229 prawns collected in the sample and euthanized during this report period. Prawn numbers are outlined in Table 3 below.

Table 3. Daily Siberian Prawn Counts at Little Goose Dam, August 26 – September 1, 2016.

Date	Sample	Collection*
August 26	295	
August 27	261	
August 28	283	
August 29	296	
August 30	540	
August 31	2,527	
September 1	1,027	
Totals	5,229	

*Collection and sample numbers are the same as the facility is currently sampling at 100%

Gas Bubble Trauma: GBT inspections ended for the season with the July 19 report. No signs of GBT were seen.

Research: The Fish Guidance Efficiency (FGE) emergency gate closure study is being performed on units 2 and 3 for 2016.

Project: Lower Granite
Biologists: Elizabeth Holdren and Robert Horal
Dates: August 26 – September 1, 2016

Turbine Operation

Units are being operated within the hard constraint 1% peak efficiency criteria. Unit 1 will remain out of service through February 2017 for Kaplan blade linkage repair. Unit 6 returned to service at 1500 hours on August 26. Unit 5 was removed from service at 0630 hours on August 29 for six year overhaul. Unit 5 is scheduled to return to service October 7. Unit 2 was forced out of service at 1255 hours on August 29 due to failure of 2 of the 3 governor oil pumps. Unit 2 returned to service at 1723 hours the same day.

Adult Fish Passage Facility

Automatic Control System monitoring of internal function for errors in the program are ongoing. Observations of the fish ladder indicate the installation of a new control program has improved fish ladder performance. The fish ladder control system remained in automatic mode during the week. As of July 28 prolonged RF (radio frequency) noise events have been interfering with PIT tag detection in the upper section of the fish ladder. PSMFC and Corps personnel continue to track down the source of the RF noise. The cause of the noise has been difficult to determine due to multiple construction activities and the Lower Granite communication upgrade. Adult fish facilities were inspected by Corps or Anchor QEA biologists on August 26, 27, 28, and 31.

Fish Ladder: Fish ladder exit head differential and depth over the weirs met criteria (≤0.5' and 1.0-1.3', respectively) on all inspections. Picketed lead head differential was in criteria (≤ 0.3'). No debris was observed near the fish ladder exit.

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

NPE1 and NPE2 weir gates were in sill criteria (criteria ≥8' or on sill) on all inspections. While on sill, the gate depth readings were 5.6', 5.6', 5.5', and 5.7 feet. The control system reading for NPE elevations fluctuate between 628.0 and 628.1 while the gates are actually on sill due to vibration of the sensor in the gate channel. North powerhouse channel/tailwater head differential met 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 met criteria (criteria 1'-2') on all inspections.

Collection Channel Velocity: 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 1 and 3 in service. Pump 2 is in standby mode.

Fish Ladder Temperature Control System: Fish ladder temperature control pumps remain in operation.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: No debris was observed in the forebay this week.

ESBSs/VBSs: ESBS/VBS inspections are scheduled for late September.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: The collection channel is operating with 18-21 orifices open. Orifices are being cycled every three hours.

Collection Facility: The facility is in collection for transport mode. The sample is being worked every other day (on transport days).

Transport Summary: Every other day barge transport ended with the last barge leaving Lower Granite on August 15. Every other day truck transport started August 17 with trucks leaving Lower Granite on even numbered days in September.

River Conditions

Summer spill ended at 0002 hours on September 1. 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
23.4	21.3	10.4	0.0	65.2	64.1	5.0+	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers were inspected August 30. Mortalities included 2 juvenile lamprey. No other fish were found.

Invasive Species: The zebra/quagga mussel substrate was inspected August 28. No zebra/quagga mussel were found. Smolt monitoring biologists euthanized 2,523 Siberian prawns from the collection sample this week.

Avian Activity: Piscivorous bird counts began March 26 with observations being taken from the top of the navigation lock. Avian hazing started April 1 and concluded June 30. Daily piscivorous bird counts are summarized in Table 2 below.

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

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
August 26	1008	0	9	0	0
August 27	1000	0	8	0	0
August 28	0915	3	10	0	0
August 29	1518	1	12	0	0
August 30	1246	0	9	0	0
August 31	1438	1	8	0	0
September 1	1130	0	3	0	0

GBT: Gas bubble trauma sampling has concluded for the season.

Adult Fish Trap Operations: The trap operated Monday through Thursday with a sample rate of 27%. Starting August 18, the trap is being operated seven day a week with a sample rate of 19%. Fall Chinook are being collected for broodstock for the Lyons Ferry Hatchery and the Nez Perce Tribe.

Fish Rescue Operation: Lower Granite's unit 5 scroll case rescue operation was conducted from 1345 hours to 1413 hours on August 30. No fish were found. A fish rescue was conducted in Dworshak's unit 3 draft tube from 1245 hours to 1355 hours on September 1. No fish were found.

Research

Anchor QEA "Sound and Vibration Effects on Adult Fish Passage through the Lower Granite Ladder": The second year of monitoring for adult fish passage delay through the ladder in response to sound and vibration from JFF construction will continue 1 March through September 2016. Weekly PIT tag detections from the ladder exit tunnel and entrance weir 648 are correlated with sound signals from hydrophones and water particle movement signals from three triangulated accelerometers at the entrance weir, weir downstream of Diffuser 14, and exit pool. Passage histories from fish previously PIT-tagged for other evaluations are used. The turn pool swing gate used to divert fish into the adult trap was moved to the non-trapping ladder passage position at about 1400 hours Friday to about 1400 hours Sunday March 1 through August 17 to allow for unobstructed passage rate PIT tag detections. Weekly progress reports are available for in-season review.

Anchor QEA "Lower Granite Ladder Temperature Reduction Structures Post-construction Evaluation of Adult Sockeye and Chinook Salmon Ladder Exit Success and Behavior": A Sonar camera was installed 20 June below the Lower Granite adult ladder exit to record sockeye and Chinook salmon ladder exit success and behavior in response to cooler water at the forebay exit and Diffuser 14 intake chimney. Passage time is recorded through the PIT tag arrays in the ladder exit tunnel. Passage time will be correlated with temperatures recorded through existing temperature probe stations and a temperature depth string at the outside edge of spray bar. Three optical cameras above the water surface at the ladder exit will record behavioral response of fish to the spray plume trajectories. Remote control boat transects of the spray affected forebay area will map velocity magnitudes and trajectories measured by ADCP (Acoustic Doppler Current Profiler) early July and mid-August. Weekly progress reports are available for in-season review.