U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#28-2016

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: September 2 – 8, 2016

Turbine Operation

All available units were operated within the 1% peak efficiency criteria. McNary turbine unit outages are recorded in Table 1 below.

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.
8 thru 10	Sep 6	71 minutes total.	Extended-length submersible bar screen (ESBSs) camera inspections.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on September 2, 4 and 7.

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

The Washington exit met all criteria during measured inspections and debris loads were minimal. Tilting weir 337 tripped an alarm on seven different occasions and was reset on September 4. The regulating weir set point was also adjusted on September 4.

At the Oregon exit and along the shoreline, debris loads were light. The count station differential was high on September 4 in the early morning. The general maintenance staff cleaned the picketed leads as soon as their overtime shift began. The head over weir measured 0.9 feet later in the day. Consequently, the regulating and tilting weirs set points were adjusted. The regulating weir set was also adjusted on September 2.

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.

To insure ladder exit flow conditions remain stable, a day light forebay elevation hard constraint was established at 338.1 to 340.0 feet on September 8. The normal hard constraint is 337.0 to 340.0 feet. The constraint will be in effect through September 30.

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. The entrance weirs tripped an alarm and were reset on September 2.

At the Oregon ladder, north powerhouse entrances, NFEW2 and NFEW3 measured 7.3 to 7.5 feet in depth all week. South powerhouse entrance, SFEW1 measured 7.7 to 7.9 feet in depth all week. South powerhouse entrance, SFEW2 measured 7.8 and 7.9 feet in depth on September 4 and 7, respectively. A possible explanation for these measurements is low tailwater elevation. Pool differentials remained in criteria.

The Oregon ladder collection channel surface velocities averaged 1.5 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 no interruptions in service this week. 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 September 3, 5 and 7. This week, 48 juvenile lamprey and 44 smolts were bypassed.

Forebay Debris/Gatewell Debris/Oil: Forebay debris loads were minimal to very light at the powerhouse and spillway. Incoming debris loads were very light. Debris predominately consisted of aquatic vegetation.

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

No problems were observed in the gatewell slots.

ESBSs/Vertical barrier screen (VBSs): ESBSs are deployed in all units. ESBS camera inspections occurred in units 8 through 10. No problems were found. The ESBSs in slots 6B, 6C, 12A and 12C remained in timer mode.

VBS differential monitoring revealed no screens out of criteria and none were cleaned. 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. Orifice attraction light bulbs were replaced at units 1 and 14.

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 two weeks. The gearbox is expected to function satisfactorily until then.

Bypass Facility: All systems have been functioning satisfactory.

River Conditions

River condition data during the week was provided by the smolt monitoring staff and is outlined in Table 2 below. Water clarity 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 2. 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
95.8	80.1	0.0	0.0	69.4	67.7	6.0	5.5

Other

Inline Cooling Water Strainers: Cooling water strainer examinations occurred on September 6. No juvenile lamprey or smolt mortalities were removed.

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

Avian Activity: Avian counts are recorded in Table 3 below.

Gull numbers fluctuated with most gulls roosting around the spill zone and feeding in the powerhouse zone. Cormorant numbers also fluctuated with most birds roosting on the navigation lock wing wall. Both species appear to be feeding on juvenile shad. No Caspian terns or pelicans were observed. Grebes were occasionally observed in the forebay zone.

Ospreys 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 September 8, the bypass outfall sprinkler system supply line was flushed and a third inverted sprinkler was installed.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
Sep 2	Forebay	0	0	0	0	0
	Spill	112	15	0	0	0
	Powerhouse	4	0	0	0	0
	Outfall	0	0	0	0	0
Sep 3	Forebay	3	0	0	0	0
	Spill	3	2	0	0	0
	Powerhouse	4	0	0	0	0
	Outfall	7	0	0	0	0
Sep 4	Forebay	0	0	0	0	0
	Spill	0	17	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Sep 5	Forebay	0	0	0	0	1
	Spill	3	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Sep 6	Forebay	0	0	0	0	1
	Spill	1	15	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	4	0	0	0
Sep 7	Forebay	0	0	0	0	0
	Spill	32	29	0	0	0
	Powerhouse	6	0	0	0	0
	Outfall	0	0	0	0	0
Sep 8	Forebay	0	0	0	0	0
	Spill	77	17	0	0	0
	Powerhouse	20	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.

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

Project: Ice Harbor
Biologists: Ken Fone and Charlie Dennis
Dates: September 2 – 8, 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. Unit 6 was out of service on September 7, from 0630 hours to 1127 hours, for the spillway bridge inspection.

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

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on September 6, 7, and 8.

Fish Ladders: The north fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over the weirs) were in criteria, except on September 7 and 8 when the depth over the weirs was 1.5 feet and 1.4 feet, respectively. The operator was informed. 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, except on September 2, from 0556 hours to 0830 hours, when FSP 1 BUS 1 feeder tripped a breaker and power was loss to three of the running pumps. During that time, only two 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 remains uninstalled to facilitate the 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. The hydrocannon at the end of the bypass pipe went out of service at 0556 hours on September 2 due to the power outage. The hydrocannon pump was restarted at 1100 hours the same 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 for fish passage began on April 3 at midnight and ended on 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
20.9	13.0	0.0	0.0	69.0	68.0	7.5	7.3

*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 found.

Invasive Species: No new exotic species have been found.

Avian Activity: There were a low number of piscivorous birds observed around the project.

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

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: September 2 – 8, 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 of January 12, 2017. Unit 4 was taken out of service at 0730 hours on August 8 for annual maintenance and returned to service at 1600 hours on September 8. Units 3, 5 and 6 were rotated out of service on September 6 for STS inspections.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on September 2, 3, 4 and 7.

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, readings were 6.8, 6.8, 7.0 and 7.5 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in depth or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, reading was 7.8 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 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 observed in gatewells.

STSs/VBSs: STSs were operated in cycle-run mode throughout the report period. STS inspections were conducted on Units 3, 5, and 6 on September 6 with all screens found in good operating condition. The remaining STS inspections in other units will be done September 13.

Orifices, Collection Channel, Dewatering Structure, and Flume: The collection channel was operated with 19 opened orifices with the exception of September 7 when only 18 orifices were open. Orifice 6B34 was found open without the light on during the September 7 inspection. The powerhouse operator was informed and they turned on the light.

Collection Facility: No problems occurred this report period.

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

River Conditions

Routine summer spill in support of fish passage 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
21.8	15.2	0.0	0.0	68.8	67.8	5.0	4.0

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on September 8. In all, 3 live Siberian prawns were recovered. Mortalities included 9 Siberian prawns and 35 American shad.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on September 4.

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. All conditions but one met the standard from the avian action plan through this time period. At 1200 hours on September 8, the water cannons of the bypass outfall pipe were turned off to replace the navigation warning sign. Hazing ended on June 2.

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
September 2	1100	1	3	0	0	0
September 3	1100	4	2	0	0	0
September 4	1145	8	2	0	0	0
September 5	1100	4	3	0	0	0
September 6	1100	2	3	0	0	0
September 7	1100	3	8	0	0	0
September 8	1100	5	1	0	0	0

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

Project: Little Goose
Biologist: Richard Weis
Dates: September 2 – 8, 2016

Turbine Operation

All turbine units were available for service except unit 4. 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. The system is operating sufficiently, but future calibration and maintenance still need to be performed.

Adult fishway inspections were performed on September 04 and 08.

Fish Ladder: 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 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. The emergency cooling pumps in the adult ladder exit operated satisfactorily this 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 7.9 and 8.1 feet. NPE weir depths ranged between 5.9 and 6.8 feet (criteria $\geq$7.0 ft.) and were on sill. NSE weir depths ranged between 4.1 to 4.5 feet (criteria $\geq$ 6.0 ft.) and were on sill. Collection channel surface water velocities measured at the north powerhouse ranged between 2.3 and 2.9 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 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 minimal.

Spillway Weir: The TSW was removed on July 11.

ESBS/VBS: Electrical ESBS brush tests were performed 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. The leak was subsequently contained and cleaned. Weirs will remain turned off until the repair is completed. The juvenile bypass system is presently running with 21 opened 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).

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 1,120 fish were collected. The descaling and mortality rates were 1.1% and 0.1% respectively. This weekly report period saw 4 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
22.5	16.3	0.0	0.0	67.8	66.7	4.0	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 Table 2 below for USACE counts.

Table 2. Daily Avian Counts at Little Goose Dam, September 2 - 8, 2016.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
September 2	1115	29	18	0	0
September 3	1430	17	0	0	0
September 4	0730	17	0	0	0
September 5	0945	6	3	0	0
September 6	None	---	---	---	---
September 7	1100	10	15	0	0
September 8	1100	8	1	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 2,537 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, September 2 - 8, 2016.

Date	Sample	Collection*
September 2	1,657	
September 3	510	
September 4	104	
September 5	76	
September 6	68	
September 7	68	
September 8	54	
Totals	2,537	

*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 this season.

Research: The Fish Guidance Efficiency (FGE) emergency gate closure study ended on July 22 and equipment was removed from unit 2 on August 30.

Project: Lower Granite
Biologists: Elizabeth Holdren and Robert Horal
Dates: September 2 – 8, 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 was return to service at 1500 hours August 26. Unit 5 was removed from service at 0630 hours on August 29 for six year overhaul. Unit 2 was out of service from 0708 to 0937 hours on September 8 to set the governor oil pump discharge relief. Unit 6 was operated out of unit priority order from 1159 to 1553 hours September 8 for EAL testing as previously coordinated.

Adult Fish Passage Facility

Automatic control system monitoring indicate that the control program is operating correctly at current tailrace elevations. Prolonged RF (Radio Frequency) noise events continue to interfering with PIT tag detection in the upper section of the fish ladder. The cause of the noise has not been determined. Adult fish facilities were inspected by Corps or Anchor QEA biologists on September 2, 3, 4, and 7.

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'). No debris was observed near the fish ladder exit.

Fish Ladder Entrances and Collection Channel: SSE1 and SSE2 weir gates met depth criteria (criteria ≥8' or on sill) on all inspections. South shore channel/tailwater head differential met 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 5.4', 5.2', 5.4', and 5.8 feet. The control system reading for NPE elevations fluctuate between 628.0 and 628.1 while on sill due to vibration of the sensor in the gate channel. 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 met criteria (criteria 1'-2') during all inspections.

Collection Channel Velocity: The collection channel average velocity met criteria (criteria 1.5-4.0 fps) on all inspections with the exception of a 1.2 fps reading on September 3. The meter reading was in criteria when checked later that day. Temporary channel velocity fluctuations below criteria have been identified on the trend graph.

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 were taken out of service for the season on September 8 at 1244 hours.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: An average of about 0.75 square yards of 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 opened orifices. Orifices are being cycled every three hours. A clipped adult steelhead mortality was discovered in the collection channel at 1910 hours on September 3. The fish likely jumped into the flow of the orifice and became stranded behind valve operator for 5B.

Collection Facility: The facility is in collection for transport mode. Sampling is occurring every other day. Adult steelhead have been observed jumping in the upwell area. Netting has been installed to prevent fish from jumping onto the concrete.

Transport Summary: Truck transport continues with trucks leaving on even numbered days in September.

River Conditions

Summer spill in support of juvenile fish passage 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
23.2	16.8	0.0	0.0	66.0	66.0	5.0+	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers are schedule to be inspected in late September.

Invasive Species: The zebra/quagga mussel substrate was inspected September 4. No zebra/quagga mussels were found. Smolt monitoring biologists euthanized 1901 Siberian prawns from the collection sample this week.

Avian Activity: 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
September 2	1243	1	9	0	0
September 3	1000	0	14	0	0
September 4	1028	1	10	0	0
September 5	1250	0	32	0	0
September 6	1600	1	26	0	0
September 7	1448	4	10	0	0
September 8	1130	3	15	0	0

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

Adult Fish Trap Operations: The trap is being operated seven day a week with a sample rate of 19%. Fall Chinook are being collected for transport to the Lyons Ferry hatchery (WDFW) and the Nez Perce Tribal hatchery.

Fish Rescue Operation: No fish rescues occurred this week.

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.