U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#29-2016

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: September 9 – 15, 2016

Turbine Operation

All available turbine 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.
3 & 4	Sep 12	9.0 hours.	Bonneville Power Administration (BPA) substation maintenance.
6	Sep 12 to 15	3.5 days.	Annual maintenance.
13 & 14	Sep 15 to 29	About 19 days.	Station service contract upgrades.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on September 9, 11 and 15.

Count station window cleaning brush air lines were replaced at both ladder exits on September 12. Trees were trimmed near the Oregon ladder visitors' center, removing limbs from the ladder on September 12.

Pacific States Marine Fisheries Commission (PSMFC) personnel repaired the electrical grounds at the Oregon ladder passive integrated transponder (PIT) tag station on September 13.

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. A low water alarm was reset on September 9.

At the Oregon exit, debris loads were light to minimal. Along the shore, debris loads were minimal. The count station differential measured 0.6 feet on September 9 during the inspection.

The general maintenance staff was called in to clean the picketed leads. A high count station differential alarm was triggered September 12 in the early morning. The general maintenance staff cleaned the picketed leads as soon as their shift began. The regulating weir set was adjusted on September 9 and 12.

Weir 338 will remain out of service until the winter maintenance season. The exit software program is regulating the weirs satisfactorily and is maintaining criteria. The fisheries staff will continue to monitor the exit frequently. The forebay elevation constraint will remain in place 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.

At the Oregon ladder, north powerhouse entrance NFEW2 measured 7.3 feet in depth on September 9. Entrance NFEW3 measured 7.2 to 7.9 feet in depth all week. South powerhouse entrances, SFEW1 and SFEW2 measured depths of 7.8 and 7.7 feet. A low pool differential alarm soundedon September 14 at night. The weirs' set points were adjusted. Both weirs measured 6.8 feet in depth on September 15. The biologist asked for the weirs' set points to be adjusted again. 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 two interruptions in service this week. On September 12, from 0802 to 0810 hours and from 1723 to 1730 hours, the pumps were taken out of service in support of bus switches. 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 9, 11, 13 and 15. This week, 48 juvenile lamprey and 28 smolts were bypassed.

Forebay Debris/Gatewell Debris/Oil: Forebay debris loads were minimal at the powerhouse and spillway as were incoming debris loads.

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 this week. The ESBSs in slots 6B, 6C, 12A and 12C remained in timer mode.

The electrical staff changed the ESBS program on September 9 so each ESBS brush bar could be operated manually while the unit is non-operational. The ESBS brush bar on the screen in slot 13A was cycling excessively and reset September 9. The screen in slot 6A tripped an alarm and was reset on September 13.

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 unit 1.

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 one week. The gearbox is expected to function satisfactorily until then.

Bypass Facility: All systems have been functioning satisfactory. Two adult lamprey were removed from the sample tanks this week.

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
105.2	72.7	0.0	0.0	67.7	66.2	6.0	6.0

Other

Inline Cooling Water Strainers: Cooling water strainer examinations are scheduled to occur on October 4.

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

Avian Activity: Avian counts are recorded in Table 3 below. Gull numbers were fairly stable with most gulls roosting around the spill zone and feeding in the powerhouse or bypass outfall zone. Cormorant numbers also were stable with most birds roosting on the navigation lock wing wall or feeding at the bypass outfall. Both species appear to be feeding on juvenile shad. No Caspian terns, grebes or pelicans were observed. 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.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
Sep 9	Forebay	0	0	0	0	0
	Spill	25	8	0	0	0
	Powerhouse	5	0	0	0	0
	Outfall	0	0	0	0	0
Sep 10	Forebay	0	0	0	0	0
	Spill	22	18	0	0	0
	Powerhouse	22	1	0	0	0
	Outfall	0	0	0	0	0
Sep 11	Forebay	0	0	0	0	0
	Spill	0	29	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Sep 12	Forebay	0	0	0	0	0
	Spill	26	49	0	0	0
	Powerhouse	36	0	0	0	0
	Outfall	5	3	0	0	0
Sep 13	Forebay	0	0	0	0	0
	Spill	33	27	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	12	1	0	0	0
Sep 14	Forebay	3	0	0	0	0
	Spill	3	12	0	0	0
	Powerhouse	56	0	0	0	0
	Outfall	2	1	0	0	0
Sep 15	Forebay	0	0	0	0	0
	Spill	35	4	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	2	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: Pacific Northwest National Laboratory (PNNL) collected 2,625 juvenile shad for testing shear forces as related to turbine units at their lab on September 14. PNNL personnel will also collect juvenile shad on September 18.

Project: Ice Harbor
Biologists: Ken Fone
Dates: September 9 – 15, 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 removed from service on August 29 at 1031 hours for annual maintenance.

The remaining available units were operated during the week, and they were operated within the 1% peak efficiency range (hard constraint).

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on September 12, 13, and 14.

Fish Ladders: The north fish ladder head differentials at the fishway exit and picketed leads were in criteria on all inspections. The depth over the weirs at the north fish ladder was out of criteria at 1.4 feet on September 12 and 13, and 1.5 feet on September 14. The stilling well for the water level sensing float at the upper diffuser was cleaned out on September 14 in an attempt to solve the problem. The south fish ladder inspection areas (head differentials at the fishway exit and picketed leads, and depth over the 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, except on September 13 when the depth was 7.4 feet and the gate was not on sill. This development may have been due to calibration issues. 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 throughout the week. South shore AWS pump 7 was out of service for replacement of the limit switches from 1038 hours on September 9 to 0749 hours on September 13

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 Lower Monumental Juvenile Fish Facility. The STS in 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. The next monthly STS inspections are scheduled for the week of September 19.

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 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
24.3	14.1	0.0	0.0	68.0	68.0	8.0	7.5

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine unit cooling water strainer inspections occurred on August 16 and 18. A total of 23 juvenile shad and 1 Siberian prawn (all mortalities) were found. The next inspections are scheduled for the week of September 19.

Invasive Species: No new exotic species have been found.

Avian Activity: There were low numbers 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 9 – 15, 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. Units 2 and 4 were rotated out of service on September 13 for STS inspection.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on September 9, 10, 11 and 14.

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 7.1, 5.7, 7.5 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, the readings were 7.7 feet.

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

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 2 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 the period. STS inspections were conducted on Units 2 and 4 on September 13 with all screens found in good operating condition.

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

Collection Facility: No problems occurred this report period.

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 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
23.9	14.2	0.0	0.0	67.8	66.4	5.0	4.2

*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. Cormorants and 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. The water cannons of the bypass outfall pipe were turned off from 1200 hours on September 8 to 1530 hours on September 9 and again from 1000 hours on September 12 to 1500 hours on September 13 to replace the navigation warning sign. No birds were seen near the bypass outfall pipe exit during these times. 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 9	1100	2	8	0	0	0
September 10	1100	3	6	0	0	0
September 11	1100	2	5	0	0	0
September 12	1100	0	7	0	0	0
September 13	1100	2	8	0	0	0
September 14	1100	2	7	0	0	0
September 15	1100	2	3	0	0	0

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

Project: Little Goose
Biologist: Richard Weis
Dates: September 9 – 15, 2016

Turbine Operation

All turbine units were available for service except unit 4. Unit 4 was placed out of service for 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 September 11, 13 and 15.

Fish Ladder: The ladder exit head differentials and water depth over weirs maintained criteria (≤ 0.5 ft. and 1.0-1.3 ft., respectively) and picketed lead differentials held steady at 0.0 feet (criteria ≤ 0.3 ft.). The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily. The emergency cooling pumps for the adult fish ladder were removed from service on September 09.

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 (≥ 8.0 ft.) on all inspections, ranging between 8.1 and 8.5 feet. NPE weir depths ranged between 6.7 and 7.6 feet (criteria ≥7.0 ft.) and were on sill. NSE weir depths ranged between 6.5 to 8.1 feet (criteria ≥ 6.0 ft.) and were on sill. Collection channel surface water velocity measured at the north powerhouse ranged between 1.9 and 2.1 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. 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 void of debris.

Spillway Weir: The TSW was removed on July 11.

ESBS/VBS: Electrical ESBS brush tests were performed on September 13. Unit 5 and 6 were found with faults and repaired. Limits switches were reset on both units.

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 and cleaned. Weirs will remain turned off until repair is complete. The juvenile bypass system is presently running with 20 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 days in September. Barge transportation 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 1,886 fish were collected. The descaling and mortality rates were 1.1% and 0.3% respectively. This weekly report period saw 0 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
23.0	16.6	0.0	0.0	66.7	66.3	6.0	4.8

*Ladder temperature.

Other

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

Cooling Water Strainers: Cooling water strainers on all units were last inspected on August 22. No mussels or fish 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 9 - 15, 2016.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
September 9	1100	14	8	0	0
September 10	1030	12	12	0	0
September 11	1345	22	15	0	0
September 12	1300	18	13	0	0
September 13	1015	7	4	0	0
September 14	1000	9	25	0	0
September 15	1145	21	20	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 1,396 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 9 - 15, 2016.

Date	Sample	Collection*
September 9	60	
September 10	107	
September 11	205	
September 12	217	
September 13	598	
September 14	131	
September 15	78	
Totals	1,396	

*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 9 – 15, 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 5 was removed from service at 0630 hours August 29 for six year overhaul and is scheduled to be back in service October 7.

Adult Fish Passage Facility

Automatic Control System monitoring indicate 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 September 9, 10, 11, and 14.

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 0.50 square yards of debris was observed near the 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 except for a reading of 7.9 feet taken on September 14. 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 6.4', 6.3', 6.9', and 7.3 feet. The control system reading for NPE elevations fluctuates between 628.0 and 628.1 while on sill due to vibration of the sensor in the gate channel. The 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 inspections except for a reading of 0.9 feet taken on September 14.

Collection Channel Velocity: Collection channel average velocity met criteria (criteria 1.5 - 4.0 fps) on all inspections with the exception of a 1.4 fps reading on September 14. 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 2.5 square yards of debris was observed in the forebay this week.

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

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

Collection Facility: The facility is in collection for transport mode. Sampling is occurring every other day.

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

River Conditions

Summer spill in support of 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
24.8	17.2	0.0	0.0	66.0	64.2	5.0+	5.0

*Cooling water intake temperature.

Other

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

Invasive Species: The zebra/quagga mussel substrate was inspected September 4. No zebra/quagga mussel were found. Smolt monitoring biologists euthanized 1,108 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 9	1045	5	31	0	0
September 10	1200	4	31	0	0
September 11	0853	3	26	0	0
September 12	1543	2	1	0	0
September 13	1242	9	7	0	0
September 14	1319	7	27	0	0
September 15	1315	9	24	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 state hatchery and the Nez Perce Tribal hatchery.

Fish Rescue Operation: A draft tube rescue operation was conducted in the Unit 1 draft tube from 0905 to 0945 hours on September 12. One live channel catfish was recovered and subsequently released at Offield landing.

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.