U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#30-2016

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: September 16 – 22, 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 overhaul. Extended-length submersible bar screen (ESBSs) failure in slots 1A and 1B.
13 & 14	Sep 15 to 29	About 19 days.	Station service contract upgrades.
7	Sep 19	5.0 hours.	Governor filter oil leak.
11 & 12	Sep 20	41 minutes.	ESBS camera inspections.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on September 17, 19 and 21. Adult lamprey video monitoring and ladder water temperature monitoring will conclude on September 30.

The control room rebooted the fishway control system computer, which regulates the ladders and ESBSs, on September 19.

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.

The Washington exit met all criteria during measured inspections and debris loads were minimal. The regulating weir set was adjusted on September 17.

At the Oregon exit and along the shore, debris loads were minimal. Following an exit alarm, the regulating and tilting weirs set points were adjusted on September 21.

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. 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 7.8 and 7.9 feet in depth on September 17 and 19, respectively. Entrance NFEW3 measured 7.8 and 7.9 feet in depth on September 17 and 21, respectively. South powerhouse entrances, SFEW1 and SFEW2 measured 7.6 to 7.9 feet in depth all week. A possible explanation for these measurements is low tailwater elevation. Pool differentials remained in criteria.

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 no interruptions in service this week. Both pumps operated with blade angles of 26 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 17, 19 and 21. This week, 16 juvenile lamprey and 32 smolts were bypassed. The last day secondary bypass will occur this season is September 29.

Secondary bypass began 25 minutes late on September 17 at 0725 hours instead of 0700 hours as scheduled. The staff member responsible for the switch to secondary bypass simply forgot to change the facility configuration on time. Two samples were missed.

Forebay Debris/Gatewell Debris/Oil: Forebay debris loads were minimal to very light.

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

No problems were observed in the gatewell slots. Two large formed plastic pieces were removed from slots 1C and 13B.

ESBSs/Vertical barrier screen (VBSs): ESBSs are deployed in all units. ESBS camera inspections occurred in units 11 and 12. Inspection results indicated that the screen in slot 12C required calibration, which the operator completed shortly afterwards. The ESBSs in slots 6B, 6C, 12A and 12C remained in timer mode. The ESBS in 12C slot was found in automatic mode on September 19. The operator returned the ESBS to timer mode, at the request of the biologist.

The Unit 11 ESBS program logic controller (PLC) recorded an error message on September 16. The electrical staff resolved the issue immediately. The electrical staff also examined the ESBS in slot 6A on September 22. No problems were found.

While testing unit 1 on September 22, the ESBSs in slots 1A and 1C were improperly restarted. The brush bars jammed at the top of the screens and the drive motors failed. Both drive motors will be replaced on September 23.

VBS differential monitoring revealed no screens out of criteria. The VBS in slots 2A and 2B were cleaned on September 19 and 22, respectively. 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. On September 22, at 1917 hours, while checking the side screen cleaning brush, the biologist found the orifice in slot 2B still closed after the VBS cleaning, which occurred approximately nine hours earlier. The biologist reopened the orifice in slot 2B and closed the makeup orifice in slot 2A immediately. No harm to fish was noted. Fortunately, very few fish are passing through the juvenile bypass system at this time. Protocols were reviewed with the technician the next day.

All dewatering and cleaning systems operated satisfactory when in automatic mode. The fisheries staff continued to monitor the side screen cleaning brush drive gearbox. One of two gearbox seals was installed on September 22. The second seal will be installed on September 26.

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
106.4	69.3	0.0	0.0	66.2	64.9	6.0	6.0

Other

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

Invasive Species: The mussel station examinations on September 23 revealed no problems.

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

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
Sep 16	Forebay	3	0	0	0	0
	Spill	5	5	0	0	0
	Powerhouse	15	0	0	0	0
	Outfall	2	0	0	0	0
Sep 17	Forebay	0	2	0	0	0
	Spill	1	16	0	0	0
	Powerhouse	0	1	0	0	0
	Outfall	0	0	0	0	0
Sep 18	Forebay	2	0	0	0	11
	Spill	46	21	0	0	0
	Powerhouse	18	0	0	0	0
	Outfall	1	2	0	0	0
Sep 19	Forebay	0	0	0	0	14
	Spill	20	37	0	0	0
	Powerhouse	24	2	0	0	0
	Outfall	1	0	0	0	0
Sep 20	Forebay	1	0	0	0	5
	Spill	312	26	0	0	0
	Powerhouse	45	0	0	0	0
	Outfall	3	2	0	0	0
Sep 21	Forebay	0	0	0	0	13
	Spill	138	32	0	0	0
	Powerhouse	33	3	0	0	0
	Outfall	2	5	0	0	0
Sep 22	Forebay	2	0	0	0	0
	Spill	75	50	0	0	0
	Powerhouse	2	1	0	0	0
	Outfall	12	0	0	0	0

Gull numbers fluctuated with most gulls roosting around the spill zone and feeding in the powerhouse or bypass outfall zone. Cormorant numbers also fluctuated 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 or pelicans were observed. Grebes were again observed in the forebay zone. Ospreys, great blue herons, kingfishers, night herons and a loon 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.

Fish Salvage/Rescue: No new mortalities were observed in the unit 1 tailwater bulkhead slots this week. The unit's two bulkhead slots were examined daily. The bulkheads were removed on September 21 at 0931 hours.

Research: Pacific Northwest National Laboratory (PNNL) collected 2,928 juvenile shad for testing shear forces at their lab as related to turbine units on September 18. No other collections are planned.

Project: Ice Harbor
Biologists: Ken Fone
Dates: September 16 – 22, 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 and the blades will be welded in place to fix the leak. Unit 2 was taken out of service on April 25 at 0606 hours for runner replacement. Unit 3 was out of service from August 29 at 1031 hours to September 16 at 1049 hours for annual maintenance. Units 1, 3, 4, and 6 were taken out of service one at a time for STS inspections on September 20 and 21.

Units were operated within the 1% peak efficiency range (hard constraint), except for unit 3. Unit 3 was sometimes operated a few megawatts below the peak efficiency range, due to the GDACS program needing to be updated with the narrower operating efficiency range of unit 3 since it became a fixed-blade unit.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on September 19, 20, and 22.

Fish Ladders: The north fish ladder inspection areas (head differentials at the fishway exit and picketed leads, and depth over the weirs) were in criteria on all inspections. 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 19 when the depth was 7.7 feet and the gate was not on sill. This 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.

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 3%. 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 in 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 1, 3, 4, and 6 STSs were inspected on September 20 and 21. No problems were 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 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
33.3	12.1	0.0	0.0	68.0	66.0	8.0	7.2

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections occurred on September 20 and 21. A total of 63 juvenile shad and 3 Siberian prawns (all mortalities) were found.

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 16 – 22, 2016

Turbine Operation

The units are being operated within the hard constraint of the 1% peak efficiency criteria. Unit 1 was removed from service on December 10, 2014 for unit rehabilitation with an estimated return to service date of January 12, 2017. Unit 5 was removed from service at 0658 hours on September 19 for annual maintenance with an estimated return to service date of October 31, 2016.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on September 16, 17, 18 and 21.

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 with the exception of the North ladder exit on September 18 where differential reading was 0.6 feet. The powerhouse operator could not clear the obstruction and called in a work crew. A large piece of cardboard was found blocking flow through the trash rack. Picketed lead head differentials were in criteria (≤ 0.4' and ≤ 0.3' for the north and south shore fishways, respectively) on all inspections with the exception of the North ladder picketed leads on September 21 with a reading of 0.5 feet. The powerhouse operator was informed and the picketed leads were cleaned.

Fishway Entrances and Collection Channel: NSE1 and NSE2 weir gates met depth criteria (criteria: ≥ 8' or on sill) on all inspections. North shore channel/tailwater head also met 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 7.4, 6.6, 6.5 and 6.8 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, readings were 7.7, 7.6 and 7.4 feet.

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

Auxiliary Water Supply System: AWS pumps 2 and 3 were operated throughout this report 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 3 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 15% surface coverage. No oil problems were observed in the gatewells.

STSs/VBSs: STSs were operated in cycle-run mode throughout this report period.

Orifices, Collection Channel, Dewatering Structure, and Flume: The collection channel was operated with 18 or 19 opened orifices.

Collection Facility: No problems occurred during this report period.

Transport Summary: Every-other-day truck transport is occurring and is scheduled to continue until 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
32.8	15.4	0.0	0.0	66.2	65.4	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. Cormorants and gulls were the dominant species observed during inspections this week. All 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
September 16	1100	3	6	0	0	0
September 17	1100	3	5	0	0	0
September 18	1100	2	6	0	0	0
September 19	1100	4	7	0	0	0
September 20	1100	3	5	0	0	0
September 21	1100	2	3	0	0	0
September 22	1100	1	4	0	0	0

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

Project: Little Goose
Biologist: Richard Weis
Dates: September 16 – 22, 2016

Turbine Operation

All turbine units were available for service except for 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 did not perform sufficiently and was returned to manual mode on September 19. Future calibration and maintenance still need to take place.

Adult fishway inspections were performed on September 18, 21 and 22.

Fish Ladder: The ladder exit head differentials and water depth at Diffuser 13 were maintained within criteria ($\leq$ 0.5 ft. and 1.0-1.3 ft., respectively) and picketed lead differentials ranged between 0.0 and 0.1 feet (criteria $\leq$ 0.3 ft.). The air bubbler used to prevent debris from collecting near the ladder exit operated satisfactorily. 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 ($\geq$ 8.0 ft.) on all inspections, ranging between 8.1 and 9.4 feet. NPE weir depths ranged between 6.2 and 7.3 feet (criteria $\geq$7.0 ft.) and were on sill. NSE weir depths ranged between 6.1 to 7.1 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured at the north powerhouse ranged between 2.0 and 2.1 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: The fish ladder is now operating on three pumps. Fish pumps 1, 2 and 3 were rotated off one at a time for oil and water leak repair on September 19. When a single fish pump was off line, the other pumps were increased in RPMs to maintain criteria in the Adult Fishway. 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 September 13. STSs in units 5 and 6 were found with faults and repaired. Limits switches were reset in both units.

Orifices, Collection Channel, Dewatering Structure, and Flume: The gear box for the weirs in the primary dewatering structure was removed from service after an oil leak was discovered. The leak was subsequently contained and cleaned. The weirs will remained turned off until the 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 daily at the juvenile fish facility (JFF). Fish transportation by truck occurs on even numbered days in September.

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 2,682 fish were collected. The descaling and mortality rates were 1.7% and 0.1% respectively. This weekly report period saw 1 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
23.6	15.5	0.0	0.0	65.3	64.6	5.3	4.2

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers in 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 16 - 22, 2016.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
September 16	1215	24	18	0	0
September 17	1115	13	8	0	0
September 18	1400	27	10	0	0
September 19	1410	33	26	0	0
September 20	1245	35	6	0	0
September 21	1045	9	0	0	0
September 22	1310	40	8	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 686 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 16	212	
September 17	63	
September 18	61	
September 19	48	
September 20	91	
September 21	72	
September 22	139	
Totals	686	

*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 16 – 22, 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 on August 29 for six year overhaul and is scheduled to be back in service October 7.

Adult Fish Passage Facility

Automatic control system monitoring indicates the control program is operating correctly at current tailrace elevations. Prolonged RF (Radio Frequency) noise events continue to interfer 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 16, 17, 18, and 21. The Fishway Control System's NSE readings were utilized on September 17 and 18 due to the North Non-Overflow elevator being out of service.

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 also met criteria (≤ 0.3'). An average of about 4.0 square yards of debris was observed near the ladder exit. The fish ladder temperature control pumps were taken out of service for the season September 8 at 1244 hours.

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 5.9', 5.5', 5.3', and 5.6 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') on all inspections.

Collection Channel Velocity: Collection channel average velocity was in criteria (criteria 1.5 - 4.0 fps) on all inspections. 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.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: An average of about 4.5 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
25.5	15.9	0.0	0.0	64.2	62.0	5.0+	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers were inspected September 22. No lamprey or fish were found.

Invasive Species: The zebra/quagga mussel substrate was inspected September 25. No zebra/quagga mussel were found. Smolt monitoring biologists euthanized 298 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 16	0950	6	28	0	0
September 17	0950	0	49	0	0
September 18	1025	5	51	0	0
September 19	1500	9	39	0	0
September 20	1545	10	38	0	0
September 21	1433	10	41	0	0
September 22	1612	1	17	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. Coho collection for the Nez Perce Tribe brood stock program started at 1300 hours on September 22.

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. This project ended September 21.