U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#31-2016

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: September 23 – 29, 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. Extended-length submersible bar screen (ESBSs) failure in slots 1A and 1B.
13 & 14	Sep 15 to 29	About 14 days.	Station service contract upgrades.
12	Sep 26 to 29	3.3 days.	Annual maintenance.
2 & 3	Sep 27	63 minutes.	ESBS camera inspections.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on September 23, 25 and 27. Adult lamprey video monitoring and ladder water temperature monitoring will conclude on September 30.

National Oceanic & Atmospheric Administration (NOAA) Fisheries personnel performed their monthly inspection on September 27.

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.

At the Oregon exit, debris loads were minimal to light. Along the shore, debris loads were minimal to moderate. The regulating weir set point was adjusted on September 23.

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 hard forebay elevation constraint will remain in place through October 15.

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 7.9 feet in depth on September 25. A possible explanation for this measurement is low tailwater elevation. All other inspection points were in criteria.

The Oregon ladder collection channel surface velocities averaged 1.4 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. Unit testing is scheduled to start the second week in November. 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 25 to 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 23, 25, 27 and 29. The last secondary bypass day for the season was September 29. The fall primary bypass season will begin on September 30 at 0700 hours. This week, 16 juvenile lamprey and 16 smolts were bypassed. No smolts were in the sample examined on September 26.

Forebay Debris/Gatewell Debris/Oil: Forebay debris loads at the powerhouse and spillway were very light to light.

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 2 and 3. No problems were found. The ESBSs in slots 6B, 6C, 12A and 12C remained in timer mode.

ESBS drive motors in slots 1A and 1C were replaced on September 23. The screen cleaning brush in slot 1A was cycling manually until September 28, when the electricians switched the brush cycle to timer mode. The screen in slot 12A was calibrated September 29.

VBS differential monitoring revealed no screens out of criteria. The VBS in slot 1A was cleaned on September 29. 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.

All dewatering and cleaning systems operated satisfactory when in automatic mode. The second of two seals in the side screen cleaning brush drive gearbox was replaced on September 26.

The three floor valves were opened one additional inch on September 26 to allow the reduction of flow passing through the two side dewatering valves.

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
113.3	79.0	0.0	0.0	64.9	64.0	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. Counting will conclude on September 30.

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. One group of Caspian terns was noted. No pelicans were observed. Grebe numbers decreased again in the forebay zone. Great blue herons, kingfishers and night herons 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 23	Forebay	0	0	0	0	6
	Spill	62	85	0	0	0
	Powerhouse	2	1	0	0	0
	Outfall	7	0	0	0	0
Sep 24	Forebay	4	0	0	0	13
	Spill	28	57	0	0	0
	Powerhouse	4	0	0	0	0
	Outfall	8	10	0	0	0
Sep 25	Forebay	0	2	0	0	10
	Spill	33	4	85	0	0
	Powerhouse	6	0	0	0	0
	Outfall	0	5	7	0	0
Sep 26	Forebay	0	0	0	0	0
	Spill	41	94	0	0	0
	Powerhouse	4	0	0	0	0
	Outfall	11	13	0	0	0
Sep 27	Forebay	0	0	0	0	0
	Spill	17	53	0	0	0
	Powerhouse	4	0	0	0	0
	Outfall	0	0	5	0	0
Sep 28	Forebay	0	0	0	0	0
	Spill	19	63	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	9	3	0	0	0
Sep 29	Forebay	0	0	0	0	0
	Spill	15	47	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	2	0	0	0	0

Fish Salvage/Rescue: No fish rescues occurred this week.

Research: No research is occurring at this time.

Project: Ice Harbor
Biologists: Ken Fone and Charlie Dennis
Dates: September 23 – 29, 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 the runner replacement.

Available 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 operating efficiency range, due to GDACS (Generic Data Acquisition and Control 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 26, 27, and 28.

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 met criteria, on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater head differential met criteria, except on September 26, when the depth was 7.6 feet and the gate was not on sill. This may have been due to calibration issues. 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 an average of 5 square yards of debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 5%. Slot 2C was un-watered 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 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 1, 3, 4, and 6 STSs were inspected on September 20 and 21, 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 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
22.0	10.50	0	0	65	64	7.8	7.1

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections occurred on September 1, 20, and 21. A total of 63 juvenile shad and 3 Siberian prawns (all mortalities) were recovered.

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 23 – 29, 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 5 was removed from service at 0658 hours on September 19 for annual maintenance with an estimated return to service of October 31, 2016.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on September 23, 24, 25 and 28.

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 7.0, 7.0, 7.3 and 7.1 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in depth criteria (criteria: ≥ 8' or on sill) on all inspections.

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 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 0 square yard 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 the report period.

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

Collection Facility: No problems occurred this week.

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

River Conditions

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
20.7	12.2	0.0	0.0	64.8	64.0	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 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 23	1100	2	7	0	0	0
September 24	1100	1	2	0	0	0
September 25	1100	2	8	0	0	0
September 26	1100	2	5	0	0	0
September 27	1100	2	8	0	0	0
September 28	1100	1	5	0	0	0
September 29	1100	2	5	0	0	0

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

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: September 23 – 29, 2016

Turbine Operation

All turbine units were available for service except for units 4 and 3. Unit 4 was placed out of service for 6-year overhaul on August 15 and returned to service on September 23. Unit 3 was placed out of service for an extended annual on September 26. 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 not operating sufficiently and was returned to manual on September mode 19. Future calibration and maintenance still need to be performed.

Adult fishway inspections were performed on September 23 and 29.

Fish Ladder: The ladder exit head differentials and water depth at Diffuser 13 maintained criteria ($\leq$ 0.5 ft. and 1.0-1.3 ft., respectively) and picketed lead differentials held steady at 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 at SSE and NPE maintained within criteria (1.0 to 2.0 ft.) on all inspections and NSE read 0.9 ft on September 25. SSE weir depths stayed in criteria ($\geq$ 8.0 ft.) on all inspections, ranging between 8.8 and 10.1 feet. NPE weir depths ranged between 7.1 and 7.7 feet (criteria $\geq$7.0 ft.) and were on sill. NSE weir depths ranged between 6.1 to 7.8 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured at the north powerhouse ranged between 1.8 and 2.4 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: The fish ladder is now operating on three pumps. The average water velocity (bottom, middle, top) of the adult channel at NPE was 3.1 fps on August 28.

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. Minimal woody debris in the immediate forebay was observed September 29.

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 electrical faults and repaired. Limits switches were reset on 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 repairs are completed. 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 387 fish were collected. Descaling and mortality rates were 3.4% and 1.1% respectively. There were no adult lamprey removed from the raceways or the sample this report period.

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
19.1	13.1	0.0	0.0	63.5	62.4	5.8	5.0

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers in all units were inspected on September 28. 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 23 - 29, 2016.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
September 23	0730	28	6	0	0
September 24	1015	21	7	0	0
September 25	1320	37	12	0	0
September 26	0730	44	0	0	0
September 27	0930	43	2	0	0
September 28	0945	28	6	0	0
September 29	1145	29	5	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 808 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 23 - 29, 2016.

Date	Sample	Collection*
September 23	194	
September 24	112	
September 25	60	
September 26	158	
September 27	114	
September 28	83	
September 29	87	
Totals	808	

*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 23 – 29, 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 indicated 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. Post-construction evaluation of Adult Sockeye and Chinook salmon ladder exit success and behavior equipment was removed from the ladder exit on September 26 and 27. Adult fish facilities were inspected by Corps or Anchor QEA biologists on September 23, 24, 25, and 28.

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 with the exception of a 1.4 feet reading of depth over the weirs September 28. Picketed lead head differential met criteria (≤ 0.3'). An average of about 0.8 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 with the exception of a 7.9 feet reading September 28. 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 6.0', 6.4', 5.6', and 6.0 feet. The control system reading for NPE elevations fluctuated 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 was in criteria (criteria 1'-2') on all inspections.

Collection Channel Velocity: The collection channel average velocity was in criteria (criteria 1.5-4.0 fps) on all inspections with the exception of a 1.4 fps measurement on September 28. 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 September 8 at 1244 hours.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: An average of about 18.8 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 orifices open. 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.

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
20.4	12.9	0.0	0.0	64.1	62.0	5.0	5.0

*Cooling water intake temperature.

Other

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

Invasive Species: The zebra/quagga mussel substrate was inspected September 4. No zebra/quagga mussels were found. Smolt monitoring biologists euthanized 138 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 23	1000	4	2	0	0
September 24	1058	3	35	0	0
September 25	0954	6	44	0	0
September 26	1442	4	8	0	0
September 27	1544	9	15	0	0
September 28	1012	4	18	0	0
September 29	1200	18	40	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 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: A fish rescue took place in the Dworshak Unit 2 draft tube from 1341 hours to 1355 hours on September 26. 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.