U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#27-2015

Project: McNary
Biologist: Bobby Johnson
Dates: August 28 – September 3, 2015

Turbine Operation

McNary had 11 to 13 of 14 units available for power generation. The hard 1 percent constraint continued. No turbine units ran outside the constraint. The sawtooth unit priority concluded September 1, at 0800 hours. Turbine unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
14	Aug 24–31	About 8 days.	Asbestos abatement.
6	Aug 31–Sep 8	About 9 days.	Asbestos abatement and hub tapped.
3	Aug 31–Sep 3	About 4 days.	Annual maintenance.
6, 7 & 8	Sep 1	46 minutes.	Extended-length submersible bar screen (ESBS) camera inspections.
11	Sep 1–2, Sep 3	About 2 days, 4.9 hours.	Kaplan head temperature issues.

Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on August 28, 30 and September 3. Visual adult fish counts, review of video tape for adult lamprey counts and exit temperature monitoring continued. On September 1, scheduled mechanical maintenance occurred at the Oregon ladder exit and entrance weirs. On September 3, scheduled heat pump maintenance occurred at both ladders' passive integrated transponder (PIT) tag stations. All systems continued to be monitored diligently as water temperatures continued to decline.

Fish Ladder Exits: Criteria at both exits are 1.0 to 1.3 feet for head over weir and 0.0 to 0.5 feet differential at the count stations. Both ladder exits met all criteria, except on August 30, when the Oregon head over weir measured 0.9 feet. Picketed leads were cleaned at both exits as required, including weekends.

At the Washington ladder exit, the regulating weir and tilting weir set points were adjusted on August 28. Aquatic vegetation quantities were minimal to light in the exit area.

At the Oregon ladder exit, the operators adjusted the regulating weir and tilting weir set points on August 28. A high picketed lead differential alarm occurred on August 31, at 0500 hours. The

operators called the general maintenance staff in early to clean the leads. Also, on August 31, the technical staff tested the exit control system and both set points were adjusted. Tilting weir 340 appeared to be slightly out of position on August 31. The operators reset the weir. Debris loads varied between light to moderate as winds moved aquatic vegetation along the Oregon shore.

Fishway Entrances and Collection Channel: Criteria for all entrances are pool differential measured at 1.0 to 2.0 feet and weir depths measured at 8.0 feet or deeper.

At the Washington entrance, all entrance inspection points met criteria.

At the Oregon ladder, on August 28, the north powerhouse entrance weir, NFEW3 measured depth was 7.9 feet, possibly due to low tailwater elevation. All other inspection points were in criteria.

Collection channel surface velocities averaged 1.5 feet per second.

Auxiliary Water Supply System: The Wasco County Public Utility District (PUD) turbine unit in the Washington ladder had one interruption in service this week. On August 31, from 0702 to 1610 hours, the unit was out of service for scheduled maintenance. The bypass system functioned properly during the outage.

Two of the three Oregon ladder fish pumps operated satisfactorily with blade angles of 30 degrees with no interruptions in service. Fish pump 2 is currently under contract for major overhaul with a completion scheduled for April, 2016.

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

Juvenile Fish Passage Facility

The fish passage season consists of alternating days of primary and secondary bypass modes. The switch occurs every morning at 0700 hours. There were no deviations in the schedule. Secondary bypass occurred on August 28, 30, September 1 and 3. This week, 12 juvenile lamprey and 48 smolts were bypassed. From August 28 at 0700 hours to August 29 at 0700 hours, no smolts were collected in the sample with a rate of 25 percent. Juvenile shad were the predominant species sampled.

The B side sample tank water temperature and fish in all areas continued to be monitored. Warm water temperatures continued to be a concern though the temperatures have been decreasing.

Forebay Debris/Gatewell Debris/Oil: The forebay debris load was minimal and scattered across the powerhouse face. New incoming debris was light and long the Oregon shore.

No high trash rack differentials were recorded and no trash racks were cleaned.

No problems were observed in the gatewell slots. We observed a sockeye adult mortality in slot 2A.

ESBSs/VBSs: All turbine units have ESBSs installed. The screens in slots 1A, 3B, 11C and 12C remained in timer mode. ESBS camera inspections at units 6, 7 and 8 revealed no problems on September 1.

No high VBS (vertical barrier screen) differentials were recorded. On August 31, the screens in slots 1A, 1B, 2A, 2B, 4A, 8A, 8B, 10A, 10B and 13B were cleaned. No fish were observed. The general maintenance staff continued to clean sponge off the downstream side of the screens. VBS rehabilitations continued.

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 August 31, the fisheries mechanic repaired one orifice actuator (each) in slots 2C and 3B.

All systems functioned satisfactorily in automatic mode. On the night of August 31, the fisheries staff monitored the channel during the spill closure. No increase in debris was noted. On September 1, the rectangular screen cleaning brush cycling time was increased from 150 to 180 minutes as debris loads decreased. The rectangular brush was also lubricated.

Bypass Facility: During the bypass season, primary and secondary bypass modes return all fish are to the river. PIT tag detection occurs in the full flow pipe during primary bypass and throughout the facility during secondary bypass. Smolt monitoring occurs only on secondary bypass days.

The sample gates are turned on and off every other day so that they are in service only during secondary bypass. The gates and all operational systems functioned well. The PIT tag sample gates remained turned off. The facility bypass lines provide a superior route for fish over the PIT tag sample release lines downstream of the PIT tag sample gates. Pacific State Marine Fish Commission (PSMFC) maintenance staff continued their weekly checks of the PIT tag detection system. The A and B side flume bypass gates remain off and open for secondary bypass.

Algae removal from the system continued on every primary bypass day.

River Conditions

River conditions during the week are outlined in Table 2 below as provided by the smolt monitoring staff. The data period runs from 0700 to 0700 hours each day. Flows and spill are recorded in one-thousand cubic feet per second. Temperature is recorded in degrees Fahrenheit. The routine summer spill program in support of fish passage continued with 50 percent of river flow being spilled until the program concluded on September 1 at 0008 hours.

The smolt monitoring staff continued recording water temperature data until temperature monitoring concluded on August 31. The results were published in a separate report.

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
160.0	99.5	80.1	0.0	70.1	68.4	6.0	6.0

*Control room data.

Other

Inline Cooling Water Strainers: The cooling water strainer examinations revealed only Siberian prawns, juvenile shad and crayfish on September 1.

Invasive Species: The next zebra mussel station examinations will occur in late September.

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

Bird hazing distress calls remain deployed around the project and continued to function satisfactorily. The fisheries mechanic and the general maintenance staff continued to clean the bird hazing water cannon pump intake three times a week.

In the forebay observation zone, an occasional gull or grebe was counted. A cormorant, osprey or flock of gulls was occasionally observed. Gulls and cormorants were roosting on the rocks by the Washington shore boat dock, which is outside the forebay observation zone.

Gulls and cormorants were observed in the tailwater observation area, feeding in the spillway flow during the spill season. After the spill closure, the gulls and cormorants moved to the powerhouse flow to feed. Gulls and cormorants continued to roost on the navigation lock wing wall. Pelicans were observed along the edges of the spill or powerhouse flow. Overall bird numbers have declined except for gulls and cormorants. It appears they are feeding on juvenile shad.

Occasionally, a gull or pelican was observed near the juvenile bypass outfall.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
Aug 28	Forebay	1	0	0	0	0
	Spill	24	10	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 29	Forebay	1	0	0	0	0
	Spill	37	17	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 30	Forebay	0	0	0	0	1
	Spill	90	27	0	2	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Aug 31	Forebay	0	0	0	0	4
	Spill	341	72	0	4	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Sep 1	Forebay	0	0	0	0	3
	Spill	66	48	0	2	0
	Powerhouse	30	0	0	0	0
	Outfall	3	0	0	1	0
Sep 2	Forebay	0	0	0	0	0
	Spill	45	10	0	0	0
	Powerhouse	4	0	0	0	0
	Outfall	3	0	0	1	0
Sep 3	Forebay	0	0	0	0	3
	Spill	45	36	0	0	0
	Powerhouse	4	0	0	0	0
	Outfall	2	0	0	0	0

Research: The adult lamprey passage study continued.

Project: Ice Harbor
Biologist: Ken Fone
Dates: August 28 – September 3, 2015

Turbine Operation

Units 4 and 3 were taken out of service for annual maintenance at 0830 hours and 0930 hours, respectively, on August 31. Units were operated within the 1% peak efficiency range (hard constraint).

Adult Fish Passage Facility

Fish facility personnel inspected the adult fishways on August 31, September 1, 2 and 3.

Fish Ladders: The north fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. The south fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. Criteria for head differentials at ladder exits and picketed leads, and depth over the weirs are 0.5 feet or less, 0.3 feet or less, and 1.0-1.3 feet, respectively. The water surfaces 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 differential were in criteria on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater differential were in criteria on all inspections. The north shore entrance (NSE-1) depth and channel/tailwater 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 on all inspections. The channel velocity criterion is 1.5-4.0 feet/second.

Auxiliary Water Supply (AWS) System: Two of the three north shore AWS pumps were operated throughout the week. Six of the eight south shore AWS pumps were operated throughout the week.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was no surface debris observed in the forebay. There was little to no surface debris coverage in the gatewells.

STSs/VBSs: The STSs are being operated in cycle-run mode. Inspection of the STSs of units 1 through 5 and VBSs of unit 2 occurred on August 13, 17, and 19. There were no screen problems observed.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The bypass is operating with 20 orifices open. Orifices were routinely cycled and back-flushed once per day.

Juvenile Fish Facility: Fish are being routed through the bypass.

Fish Sampling: Fish sampling is done for the season.

Removable Spillway Weir (RSW): Mandated spill for fish passage which began on April 3 ended this week on August 23 at 2350 hours. Spill gate 2 was kept closed during this reporting period because there was not enough river flow to simultaneously operate the RSW and maintain minimum generation requirements.

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
21.4	9.9	10.3	0.0	69	69	8.2	7.0

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: The turbine cooling water strainers for units 1 through 5 were inspected on August 17 and 19. Recoveries included 3 juvenile channel catfish, 1 juvenile shad, and 7 Siberian prawns found (all mortalities).

Invasive Species: No new exotic species have been found.

Avian Activity: In general, a relatively low amount of piscivorous birds were around the dam during the week, with the majority of birds roosting on Eagle Island.

Research: Sensor fish release pipes were installed on the STS framework from gatewell slot 1B on August 13, in preparation for the turbine environment characterization study occurring in September.

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: August 28 – September 3, 2015

Turbine Operation

The units are being operated in hard constraint of the 1% operation criteria. Unit 1 was removed from service on December 10, 2014 for unit rehabilitation with an estimated return to service date of January 12, 2017. Unit 4 was removed from service on August 31 at 0735 hours for a headgate transfer and returned to service at 0930 hours. Unit 5 was removed from service on August 31 at 0730 hours for a headgate and headgate cylinder transfer and returned to service at 1100 hours. Unit 6 was removed from service on August 31 at 0725 hours for annual maintenance with an estimated return to service of September 17. Units 3, 4 and 5 were rotated out of service on September 1 and Unit 2 on September 2 for STS inspections.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Blue Leaf Environmental biologists on August 28, 29, 30 and September 2.

Fish Ladders: Fishway exit head differentials and depths over the weirs were within criteria (≤ 0.5' and 1.0'-1.3', respectively) on all inspections. Picketed lead head differentials were in criteria (≤ 0.4' and ≤ 0.3' for north and south shore fishways, respectively) on all inspections with the exception of August 29 with north fishway differential of 0.5'. Upon notification, JFF personnel cleaned the north fishway picketed leads, and the differentials were within criteria for the remainder of the observation period.

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, both gate depth readings ranged from 6.5 to 7.0 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, gate depth readings ranged from 7.4 to 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 1, 2, and 3 were operated throughout this period.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 7 square yards of forebay debris observed during this period. Gatewell debris ranged from 0 - 5% surface coverage. No problems were observed in the gatewells.

STSs/VBSs: STS operations changed to cycle-run mode on August 7 as average sub-yearling Chinook length became greater than 120 mm. STS inspections were conducted September 1 and 2 with all screens found in good operating condition.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel was operated with 20 orifices open.

Collection Facility: Operated in collection for transport mode. No problems occurred.

Transport Summary: Every-other-day truck transport is occurring and scheduled to continue through 0700 hours on October 1.

River Conditions

Routine spill in support of fish passage was initiated at 0001 hours on April 3 and ended at 2400 hours on August 31. Due to insufficient flows, the RWS was closed on August 8 and spill continued in this configuration through 2400 hours on August 31. Spill this period conformed to specified requirements. 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
20.0	13.1	7.7	0.0	70	69	5.0	5.0

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on September 2. Live fish recovered included 47 Siberian prawn. Mortalities included 50 Siberian prawn.

Invasive Species: No zebra mussels were observed at the monitoring stations on August 2.

Avian Activity: Daily tailrace counts of feeding piscivorous birds are summarized in Table 2 below. Gulls and cormorants were the dominant species observed during inspections this week. Hazing ended on June 2.

Table 2. Lower Monumental Tailrace Counts of Foraging Piscivorous Birds.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
August 28	1100	6	1	0	0
August 29	1100	2	0	0	0
August 30	1130	2	0	0	0
August 31	1130	3	1	0	0
September 1	1100	9	0	0	0
September 2	1100	3	0	0	0
September 3	1100	1	2	0	0

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

Project: Little Goose
Biologist: Richard Weis
Dates: August 28 – September 3, 2015

Turbine Operation

All turbine units were available for service throughout this report period except units 2, 3 and 4. Unit 2 was forced out of service on September 3 at 1400 hours and returned to service at 1720 hours, due to a water leak. Unit 4 was removed from service on August 18 for annual maintenance. Unit 3 was placed out of service on August 25 for digital governor installation. Hard 1% peak efficiency constraint criteria are in effect. No violations were seen.

Adult Fish Passage Facility

Adult fishway inspections were performed on August 30, 31 and Sept. 03.

Fish Ladder: The ladder exit head differentials ranged between 0.0 and 0.1 feet (criteria $\leq$ 0.5 ft.). Water depths over the ladder weirs ranged between 1.2 and 1.3 feet (criteria 1.0-1.3 ft.) and picketed lead head 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.

Fishway Entrances and Collection Channel: The Adult Fishway system is in Automatic mode. Channel to tailwater head differentials ranged between 1.0 and 1.9 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.4 and 8.5 feet (criteria $\geq$ 8.0 ft). NPE weir depths ranged between 4.4 and 4.7 feet and were on sill (criteria $\geq$7.0 ft. or on sill). NSE weir depths ranged between 5.9 and 6.5 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). The monthly water velocity measured at the north powerhouse using the Rickly velocity equipment measured 1 foot from bottom, mid depth and surface averaged 3.8 fps.

Auxiliary Water Supply System: Fish pumps 2 and 3 operated as designed. Fish pump 1 gear box was rebuilt and is waiting parts to allow placement of the gearbox into position.

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 was 0 square feet for the week.

Spillway Weir: Spillway weir was removed for the season on June 18.

ESBS/VBS: ESBS screens are all deployed and gatewells are clean. Drawdowns were performed on September 01 on unit 1. All were in criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile bypass system is running with 21 open orifices.

Transportation Facility: The JFF continued transporting fish every other day by truck. GBT (Gas Bubble Trauma) sampling ended for the season.

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 418 fish were collected for transport. The descaling and mortality rates were 0.1% and 0.6% respectively. This weekly report period saw no adult lamprey removed from sample and released upstream 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
19.4	15.4	7.2	0	69.0	68.1	6.0	4.7

*Ladder temperature.

Other

Inline Cooling Water Strainers: All cooling water strainers were checked on August 26. No fish were seen.

Invasive Species: The zebra mussel substrate monitor was inspected on August 17. No zebra mussels were detected.

Avian Activity: Bird hazing ended on June 16. See chart below for numbers observed daily.

Table 2. Daily maximum tailrace piscivorous bird counts at Little Goose Dam*.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
August 28	1000	11	9	0	0
August 29	1015	15	3	0	0
August 30	0745	8	5	2	0
August 31	1100	19	7	0	0
September 1	0800	5	6	0	0
September 2	1030	0	8	0	0
September 3	1050	15	19	0	0

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

Scroll Case Temperature: Little Goose Dam has only one temperature probe on the Scroll Case in unit 1 only. The temperature ranged between 68.5 and 69 degrees F.

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

Project: Lower Granite
Biologists: Elizabeth Holdren, Robert (JR) Horal
Dates: August 28 – September 3, 2015

Turbine Operation

Units are operating within the hard constraint 1% criteria. Unit 4 was forced out of service at 0830 hrs on August 28 due to a malfunctioning ESBS in the B slot. Unit 4 returned to service at 1603 hours the same day. Unit 6 is out of service for annual maintenance. Units were rotated out of service on August 28 and 29 for VBS inspections.

Adult Fish Passage Facility

The adult fish ladder was inspected by Corps or Blue Leaf Environmental biologists on August 28, 29, 30, and September 2.

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') on all inspections.

Fishway Entrances and Collection Channel: SSE1 and SSE2 weir gates were in depth criteria (criteria ≥8' or on sill) on all inspections. The 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 weir gate depth readings were 6.1', 6.2', 5.3', and 6.9 feet. North powerhouse channel/tailwater head differential was in criteria (criteria 1'-2') with the exception of a 0.9 feet reading on September 2.

NSE1 remains closed. NSE2 is set with a chain fall hoist at 626.5 feet. NSE2 met depth criteria (criteria ≥7' or on sill) on all inspections. North shore channel/tailwater head differential was out of criteria (criteria 1'-2') on all inspections with differentials of 0.8', 0.9', 0.9', and 0.9' feet.

Collection channel velocity was out of criteria (criteria 1.5-4.0 fps) on all inspections with readings ranging from 1.0 – 0.9 fps and a weekly average of 1.0 fps. Alternative methods of measuring collection channel velocity are being investigated.

Auxiliary Water Supply System: The fish ladder is in two pump operation with AWS pumps 1 and 2 operating and pump 3 in standby mode.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Forebay debris was minimal. Daily gatewell surfaces inspections continue. Floating debris is being removed daily to prevent orifice blockages. No oil was reported in gatewell slots.

ESBSs/VBSs: Video inspections were done on August 28 and 29. All screens passed inspections.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Orifices are being backflushed every three hours.

Collection Facility: Collection for juvenile transport and condition sampling continues.

Transport Summary: Truck transport continues with truck departing Lower Granite on even numbered days in August and odd numbered days in September.

River Conditions

Routine summer spill in support of fish passage ended at 0001 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	15.5	7.9	0.0	66.0	64.0	5.0+	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Unit cooling water strainers are scheduled for inspection at the end of September.

Invasive Species: No evidence of zebra/quagga mussel was observed August 9.

Avian Activity: Piscivorous bird observation counts are taken from the juvenile fish separator platform one hour after sunrise and one hour before sunset. Maximum piscivorous bird counts are summarized in Table 2 below.

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

Date	Time (hours)	Gulls	Cormorants	Terns
August 28	0700	2	0	0
August 29	0700	2	0	0
August 30	0700	1	0	0
August 31	0700	1	9	0
September 1	0700	2	0	0
September 2	0715	1	0	0
September 3	1820	0	9	0

Fish Ladder Temperature Mitigation: Auxiliary pump 1 (supplies water to the ladder exit) and the three temporary ladder cooling pumps remain in 24 hour operation.

Adult Fish Trap Operations: The trap was operated from 0700-1100 hours on August 28 and 30. Starting August 31 at 0700 hours, the trap began 24 hour operation with a 12 % sample rate.

Fish Rescue Operation: No fish rescues occurred.

Research

U.S. Geological Survey (USGS) Early Life History of Juvenile Fall Chinook: This project focuses on research, monitoring, and evaluation of spawning and early life history of Snake River fall Chinook salmon, develop strategies to reduce non-indigenous fish, and enhance research on salmon predators and invasive species. LGR and LGO reservoirs food web changes are being investigated to determine importance of non-native Siberian prawn and opossum shrimp in juvenile salmon diets. USGS did not sample during this report week.