U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#11-2015

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: May 8 - 14, 2015

Turbine Operation

McNary had 13 of 14 units available for power generation. The hard 1 percent constraint continued. No turbine units ran outside the constraint. Turbine unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Project.

Units	Outage Dates	Outage Length	Reason
12	Feb 8 – Aug 1	About 6 months.	Rewind contract.
5 – 11, 13 & 14	May 11	6.7 hours total.	Trash rack cleaning.
1 – 5	May 12	5.7 hours total.	Trash rack cleaning.

Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on May 8, 11 and 13. Visual adult fish counts continued.

Fish Ladder Exits: Both ladder exits met all Fish Passage Plan (FPP) criteria. Debris loads in the area of the exits were generally minimal. Brief light debris influxes occurred along the Oregon shore when northeast winds occur.

At the Oregon ladder exit, a fisheries technician reported an unusual noise from the north traveling screen, when operational, on May 12. The biologist verified the noise. The operators and powerhouse mechanics found a stick lodged in the screen housing. The mechanics performed maintenance on the north screen the next day. The operators adjusted the regulating weir set point on May 13.

Fishway Entrances and Collection Channel: All entrance inspection points met criteria.

Collection channel surface velocities averaged 1.9 feet per second.

Auxiliary Water Supply System: The Wasco County Public Utility District (PUD) turbine unit in the Washington ladder had no interruptions in service.

Two of the three Oregon ladder fish pumps operated satisfactorily with blade angles of 30 degrees. The electrical staff resolved a momentary fish pump 1 excitation alarm on May 14.

Pump 2 is currently under contract for major overhaul. The contractor mobilized on May 11. The repairs should be completed by September, 2015.

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 May 8, 10, 12 and 14. This week, 254,704 smolts were bypassed. The smolt monitoring staff sampled no juvenile lamprey.

Forebay Debris/Gatewell Debris/Oil: The forebay debris load remained light and generally centered on the powerhouse except when northeast winds would temporarily move it toward the Oregon shore. Incoming debris was very light.

No high trash rack differentials were recorded. The general maintenance staff cleaned trash racks in units 1 to 8 and slots 9A, 10A, 11A, 13A and 14A on May 11 and 12. They removed 11 ten-yard truck loads of woody debris from the southern units. No unit 12 slots were cleaned as the unit is out of service. The fisheries staff observed no lamprey or ESA listed fish in the debris. We noted two smolt mortalities in the gatewell slots.

No problems were observed in the gatewell slots. Several piece of woody debris were removed after trash rack cleaning.

ESBSs/VBSs: All operational turbine units have ESBSs installed. Screens were not installed in unit 12 as this unit is out of service. ESBS camera inspections did not occur this week. The fisheries staff monitored trash rack cleaning instead.

Rehabilitation of vertical barrier screens (VBSs) continued. No high VBS differentials were recorded. The VBS in slot 5A was cleaned on May 14. The general maintenance staff inspected the screens in units 2 and 3 along with screens in slots 4A, 9A and 9B on May 13. No problems were found. The fisheries staff observed no ESA listed fish mortalities or lamprey mortalities.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: Forty two orifices were in use. The fisheries mechanic replaced the north orifice valve actuator oil reservoir in slot 9C and removed rust flakes from the south orifice actuator in 8B slot on May 12.

During VBS cleaning and inspection, and trash rack cleaning operations, orifices in the affected slots were closed with makeup water coming from orifices in adjacent slots.

All systems functioned satisfactorily in automatic mode.

Bypass Facility: During the bypass season, primary and secondary bypass modes return all fish are to the river. Passive integrated transponder (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 the 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.

A contractor replaced a separator observation building window May 12.

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. Routine spring spill in support of fish passage continued with both top spillway weirs (TSWs) opened. Forty percent of river flow is spilled in the spring season. The spill pattern was altered for navigation as required.

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
189.5	142.9	76.1	57.5	56.0	54.0	6.0	6.0

*Control room data.

Other

Inline Cooling Water Strainers: The next in line cooling water strainer examinations will occur in early June.

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

Avian Activity: Avian counts are recorded in Table 4 below.

Gulls were observed in the forebay feeding and roosting along with an occasional group of grebes or an osprey. The gulls appear to be attracted by the large number of smolts in the forebay. Gulls, pelicans and cormorants were roosting on the rocks by the Washington shore boat dock, which is outside the forebay zone. No grebes were observed in the gatewell slots or in the juvenile bypass system.

Gulls were observed in the tailwater area feeding at the southern edge of the spillway flow along with an occasional cormorant. Gulls and an occasional cormorant were noted feeding at the juvenile bypass outfall.

Bird hazing distress calls remain deployed around the project and the bird hazing water cannon continued to function satisfactorily. A fisheries mechanic noted the water cannon supply pump operating above normal temperatures on May 11. Both fisheries mechanics cleaned the pump intake, immediately removing algae. The fisheries staff asked project engineers to explore the intake issue for solutions.

Table 4. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
May 8	Forebay	7	0	0	0	1
	Spill	59	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	7	0	0	0	0
May 9	Forebay	45	0	0	0	0
	Spill	46	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	3	0	0	0	0
May 10	Forebay	2	0	0	0	0
	Spill	52	3	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	9	2	0	0	0
May 11	Forebay	16	0	0	0	4
	Spill	145	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	5	0	0	0	0
May 12	Forebay	30	0	0	0	4
	Spill	65	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	4	0	0	0	0
May 13	Forebay	1	0	0	0	4
	Spill	75	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	20	0	0	0	0
May 14	Forebay	2	0	0	0	0
	Spill	56	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	6	0	0	0	0

United States Department of Agriculture – Animal and Plant Health Inspection Service – Wildlife Services (USDA–APHIS–WS) personnel continued bird hazing at the project. A

second shift and boat hazing continued. The boat will be used on Monday, Wednesday and Friday each week. Limited lethal take of gulls and cormorants also began this week.

Research: Gas bubble trauma (GBT) examinations continued. Preparations for the adult lamprey passage study continue.

Project: Ice Harbor
Biologist: Ken Fone
Dates: May 8 - 14, 2015

Turbine Operation

All units were available for service. Units were operated within the 1% peak efficiency range (hard constraint).

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on May 11, 12, 13, and 14.

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) depth and channel/tailwater differential were in criteria on all inspections. The north powerhouse entrance (NFE) depth and channel/tailwater differential were in criteria, except for a depth of 7.0 feet on May 11, which was attributed to the entrance gate mistakenly being positioned off of sill in manual control. The north shore entrance (NSE) depth and channel/tailwater differential were in criteria. 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. North shore pump 3 was taken out of service at 0846 hours on April 22 to replace the pre-lubrication pump. Six of the eight south shore AWS pumps were operated.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was 0-5 square yards of surface debris observed in the forebay. There was little to no surface debris coverage in the gatewells.

STSs/VBSs: Inspection of each unit's STSs occurred on April 21 and 23. Inspection of 1B and 1C VBSs occurred on April 23. No screen problems were observed. The next STS inspections are scheduled for the week of May 18.

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

Juvenile Fish Facility: Fish are being routed through the bypass, except when sampling operations are occurring.

Fish Sampling: Sampling days will alternate from Monday and Wednesday, to Tuesday and Thursday, each week. Sampling occurred on May 12 and 14. Sampling results are outlined in Table 1. The descaling rate was 11% and 7% on May 12 and May 14, respectively. Fish facility personnel will continue to inspect fish passage routes for possible causes of descaling.

Removable Spillway Weir (RSW): Mandated spill for fish passage began on April 3. The RSW is in operation.

Table 1. Fish condition sampling results at Ice Harbor Dam.

May 12:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	27	3	0	0
UC-CH	4	0	0	0
C-CH-O	0	---	---	---
UC-CH-O	0	---	---	---
C-SH	79	9	0	0
UC-SH	21	2	0	0
C-COHO	0	---	---	---
UC-COHO	0	---	---	---
C-SOCK	0	---	---	---
UC-SOCK	0	---	---	---
TOTAL	131	14	0	0

May 14:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	10	0	0	0
UC-CH	4	2	0	0
C-CH-O	0	---	---	---
UC-CH-O	0	---	---	---
C-SH	70	5	0	3
UC-SH	34	1	0	3
C-COHO	0	---	---	---
UC-COHO	3	1	0	0
C-SOCK	0	---	---	---
UC-SOCK	0	---	---	---
TOTAL	121	9	0	6

River Conditions

River conditions during the week are outlined in Table 2 below.

Table 2. 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
63.6	51.5	41.3	15.5	56	55	6.8	6.2

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections occurred on April 21 and 23. The fish (all mortalities) found were 1 juvenile steelhead, 5 juvenile lamprey, 3 Siberian prawns, and 1 sandroller. The next inspections are scheduled for the week of May 18.

Invasive Species: No new exotic species have been found.

Avian Activity: Daily total bird numbers observed this week (Table 3) fluctuated up and down, but overall were similar to what was observed last week. Contracted land-based hazing of piscivorous birds occurred for 16 hours per day. Additionally, concurrent boat-based hazing took place for 8 hours per day, 5 days per week. The hazing program has been effective at pushing birds away from the dam.

Table 3. Daily maximum piscivorous bird counts at Ice Harbor Dam

Date	Gulls	Cormorants	Caspian Terns	Grebes	Pelicans
May 8	16	23	0	0	14
May 9	34	43	0	0	45
May 10	53	44	0	0	32
May 11	30	5	0	0	2
May 12	5	16	0	0	12
May 13	14	64	0	0	7
May 14	35	46	0	0	6

Research: Hydroaccoustic transducers mounted on the STS frame in gatewell slot 1B, and on 1B trash rack, are collecting data for the turbine intake fish distribution study.

Project: Lower Monumental
Biologists: Bill Spurgeon and Raymond Addis
Dates: May 8 - 14, 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.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Blue Leaf Environmental biologists on May 8, 9, 10 and 13.

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 both gate depth readings ranged from 5.8 to 6.7 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 5.7 to 7.3 feet. SSE2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head was in criteria (1'-2') on all inspections with the exception of May 10 at 2.1 feet. Operator was informed and believed it was caused by a change in spill, since the differential was within criteria afterwards.

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 22.75 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-20% surface coverage. A sheen was seen in gatewell 2B on May 10. The operator was informed.

STSs/VBSs: STSs are operating in cycle mode. STS inspections were conducted May 5 and 6 with all screens found in good operating condition.

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

Collection Facility: Collection into raceways for transport began at 0700 hours on May 1.

Transport Summary: Every-day barging began on May 2. Barge 2127 (Sockeye) struck the center and upstream pillars of the barge dock while maneuvering to tie up on May 11 and received damage to its left front corner. The dock sustained damage to vertical timbers.

River Conditions

Spring spill operations were initiated at 0001 hours on April 3. Spill was either halted or limited during barge docking and loading operations.

River conditions during the week are outlined in Table 1.

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
63.6	50.1	23.7	23.3	56.0	56.0	4.5	3.5

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on May 6. There were no live fish recovered. Mortalities included 12 salmon smolts and 1 Siberian prawn.

Invasive Species: No zebra mussels were observed at the monitoring stations on May 3.

Avian Activity: Daily tailrace counts of feeding piscivorous birds are summarized in Table 2 below. Gulls were the dominant species observed during inspections this week. Hazing met the standard from the avian action plan through this time period.

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

Date	Time (hours)	Gulls	Cormorants	Terns	Pelicans
May 8	1100	0	0	0	0
May 9	1100	0	0	0	0
May 10	1100	0	0	0	0
May 11	1100	0	0	0	0
May 12	1100	0	0	0	0
May 13	1100	3	0	0	0
May 14	1110	0	0	0	0

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

Project: Little Goose
Biologist: Richard Weis
Dates: May 8 - 14, 2015

Turbine Operation

All turbine units were available for service throughout this report period. Hard 1% peak efficiency constraint criteria are in effect. No violations were seen.

Adult Fish Passage Facility

Adult fishway inspections were performed on May 08, 10 and 14.

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 held steady at 1.2 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.). No debris was observed at the picketed leads or the ladder exit area. 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 manual mode. Channel to tailwater head differentials ranged between 0.9 and 1.8 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 7.6 and 8.8 feet (criteria $\geq$ 8.0 ft). NPE weir depths ranged between 4.2 and 5.9 feet (criteria $\geq$7.0 ft. or on sill). NSE weir depths ranged between 6.5 and 7.0 feet and were on sill (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity measured at the North powerhouse ranged between 1.9 and 2.3 fps (criteria 1.5 to 4.0 fps). The monthly April water velocity measured at the north powerhouse using the Rickly velocity equipment measured 1 foot from bottom, mid depth and surface averaged 2.6fps.

Auxiliary Water Supply System: Fish pumps 2 and 3 operated as designed. The fish pump 1 gear box was rebuilt and is waiting on additional parts needed to place the rebuilt gear box 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 estimated between 0 to 20 square feet.

Spillway Weir: The spillway weir is operating in the High Crest position.

ESBS/VBS: ESBS screens are all deployed and gatewells are cleaned. Drawdowns were performed on units 1, 2 and 3 on May 14. All measurements met criteria.

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

Transportation Facility: The JFF is currently sampling every day. GBT (Gas Bubble Trauma) sampling was performed on May 11. One fish was seen with signs of GBT in the fins.

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 431,323 fish were collected for transport. The descaling and mortality rates were 1.1% and 0.02% respectively. This weekly report period saw 3 adult lamprey removed from the sample and released in the tailrace.

River Conditions

River conditions during the week are outlined in Table 1.

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
63.2	49.2	18.9	15.1	56.2	55.5	6.0	3.8

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were not checked this week.

Invasive Species: The zebra mussel substrate monitor was inspected on May 08. No zebra mussels were detected.

Avian Activity: Bird counting and hazing resumed on April 01. See chart below for details.

Table 2. Little Goose Dam Tailrace Counts of Foraging Piscivorous Birds.

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
May 8	0800	30	4	0	0
May 9	0800	40	2	0	0
May 10	1400	52	0	0	0
May 11	1600	104	0	0	1
May 12	1330	51	1	0	2
May 13	1540	67	0	0	9
May 14	1300	16	0	0	2

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

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

Project: Lower Granite
Biologists: Elizabeth Holdren and Ches Brooks
Dates: May 8 - 14, 2015

Turbine Operation

Units are operating within the hard 1% peak efficiency constraint criteria. Unit 4 was forced out of service from 0702 hours May 8 to 1342 hours May 11 due to a failed ESBS screen cleaner in slot 4C. Unit 3 was forced out of service at 2000 hours May 14 due to upper guide bearing issues.

Adult Fish Passage Facility

The adult fishway was inspected by Corps or Blue Leaf Environmental biologists on May 9, 10, 11, 12, and 13.

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. 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 depths reading were 5.0', 5.1', 5.4', 5.4', and 5.5 feet. North powerhouse channel/tailwater head differentials were in criteria (criteria 1'-2') on all inspections.

NSE1 remains in the closed position. NSE2 is set with a chain fall hoist at 626.0 feet. NSE2 was in depth criteria (criteria ≥7' or on sill) on all inspections. North shore channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections with the exception of a 0.9 feet reading on May 11.

Collection channel velocity was out of criteria (criteria 1.5-4.0 fps) on all inspections with readings ranging from 1.0 - 1.2 fps and a weekly average of 1.1 fps. Alternative methods of measuring collection channel velocity are being investigated for installation as part of the adult fish ladder control system upgrade.

Auxiliary Water Supply System: The ladder is in two pump operation with AWS pumps 1 and 3 in service. Operation of AWS pump 1 motor in "fast speed" mode trips the overload safety relay during low tailwater conditions. Pump 2 is out of service following lower guide bearing repairs and is scheduled for testing May 27.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Forebay debris varied with wind strength and direction. Daily gatewell surfaces inspections continue with floating debris being removed by hand basket to prevent orifice blockages. No oil was reported in gatewell slots.

ESBSs/VBSs: Video inspections are scheduled for late May. The ESBS screen cleaner in slot 4C failed at 0720 hours on May 8. The problem was determined to be rotor separation from the shaft. The ESBS was deployed with the cleaner operational May 11. This is the first failure of this type identified at Lower Granite. The powerhouse mechanical crew is investigating this issue and has three motors in standby ready to install if another failure were to occur.

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

Collection Facility: Collection for transport continues.

Transport Summary: Every day barge transport is occurring.

River Conditions

Routine spill in support of fish passage continues. 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
65.0	51.2	20.4	20.2	54.5	54.0	5.0+	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: The next inspections are scheduled for late May.

Invasive Species: No evidence of zebra/quagga mussel was observed May 3.

Avian Activity: Hazing activities began April 1. Piscivorous bird counts began March 26 with observations being 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
May 8	0630	8	0	0
May 9	1900	3	0	0
May 10	1900	0	0	0
May 11	1900	5	0	0
May 12	1900	0	0	0
May 13	1900	1	0	0
May 14	1900	0	0	0

GBT: PSMFC personnel conducted gas bubble trauma (GBT) examinations May 14.

Adult Fish Trap Operations: The adult fish trap is operating at a sample rate of 11% Monday through Friday with an average weekly sample rate of 8%.

Fish Rescue Operation: No fish rescues occurred this week.

Research

Idaho Fish and Game (IDFG) Genetic Stock Identification: This study aims to enumerate and characterize natural production of yearling Chinook and juvenile steelhead above LGR with regards to age composition and genetic stock profiles. IDFG will sample Monday through Friday through mid June with a goal of collecting 2,000-5,000 genetic samples from yearling Chinook and juvenile steelhead.

Nez Perce Tribe (NPT)/U. of Idaho (UI)/Columbia River Intertribal Fisheries Commission (CRITFC) – Kelt Study: NPT began steelhead kelt collection March 29. This research project investigates steelhead kelt physiology and endocrinology to evaluate the feasibility and success of rehabilitating strategies. NPT will transport up to 150 kelts to Dworshak National Fish Hatchery as part of this study.

National Marine Fisheries Service (NMFS) In-River Survival: NMFS staff has begun PIT-tagging Chinook and steelhead smolts for their Survival Study to compare smolt to adult returns of in-river migrating smolts to the smolt to adult returns of transported smolts. PIT-tagged fish are held for 24 hours before being bypassed to the LGR tailrace.

National Marine Fisheries Service (NMFS)-Monitoring the Migrations of Wild Snake River Spring/Summer Chinook: This study is monitoring the migration behavior and survival of wild spring/summer Chinook salmon. The specific goals are to characterize the migration timing and estimate parr-to-smolt survival to LGR of wild Chinook populations as they migrate from their natal rearing areas and determine migration patterns and what environmental factors influence those patterns. Fish were PIT-tagged during the summer of 2014 in natal streams and are diverted to the Sort-By-Code tanks at LGR.