U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#13-2014

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: May 23 - 29, 2014

Turbine Operation

McNary had 12 units available for power generation this week. On April 1, the hard constraint one percent criteria began. No units ran outside the criterion. Headgates have been lowered in their stored operating gate (SOG) positions in units 2, 3, 5, 6 and 8 to 10 in support of research. In recent years, operating gates have generally been pinned in partially raised positions (PROG) as studies in the 1980s and early 1990s indicated slight improvements fish guidance in slots equipped with submerged traveling screens (STSs). Gatewell conditions and fish guidance efficiencies are again being investigated as the ESBSs (extended-length submerged bar screens) installed since these studies have certainly changed hydraulic conditions in the gatewells. From May 28 at 0600 hours to May 29 at 0700 hours, and from May 30 at 0700 hours to June 1 at 0700 hours (after the close of this report period), these units were run at 50MW (lower one percent of the efficiency curve) to see if this would have an effect on the elevated descaling rates reported last week. Unit outages are recorded in Table 1.

Table 1. Unit Outages at McNary Dam.

Units	Outage Dates	Outage Length	Reason
11	Sep 18 to Jul 31	About 10.5 months.	Turbine bearing issue continues.
4	Mar 27 to Jul 31	About 4 months.	Turbine bearing issue continues.
1, 2, 9, 10 & 12 to 14	May 26	14 minutes or less each.	Unplanned spin/no load operation - BPA transmission line interruption.
2	May 27	Six hours.	Replace VBS at A slot.
8	May 27	28 minutes.	ESBS camera inspections.
7	May 27	One hour.	Trash rack cleaning.

Adult Fish Passage Facilities

On May 23, 25 and 27, the McNary fisheries biologist performed measured inspections of the adult fishways. Visual adult fish counting continues. The fisheries staff is checking the exits on all shifts when the juvenile system is in primary bypass.

Fish Ladder Exits: During measured inspections, both ladder exits met all Fish Passage Plan criteria. Debris loads remained low near the exits. The Washington exit generally has more debris present than the Oregon exit. The fisheries staff is checking the exits on all shifts when the

juvenile system is in primary bypass. On May 25, the Washington exit set points were adjusted. On May 27, Washington exit weir 339 triggered an alarm, which the operator reset without incident. At the Oregon exit, our differential monitoring of the traveling screens revealed no problems. Four differential alarms occurred, which the operator reset – also without incident.

Fishway Entrances and Collection Channel: All Washington ladder entrance inspection points were in criteria. Occasionally, both weirs exhibit a slight amount of slack in their cables. Slackness is most frequently noted in W3's south cable. On May 25 and May 28, the biologist and chief operator, respectively, noted that the tailwater sensor required calibration, which occurred. In the near future, the project will replace the LEDs (Light Emitting Diodes) at weir entrances W2 and W3 with a PLC (Programmable Logic Circuit), which will more easily integrate into the new control system.

All inspection points at the Oregon ladder entrances were in criteria except on May 23 and 25, when the south powerhouse entrance, SFEW2, measured depths of 7.9 feet. SFEW2 continues to drift in and out of calibration. We hope to complete the upgrades of the Oregon entrances in the near future. At the north powerhouse entrance, NFEW2's south cable occasionally had a very slight amount of slack in it. Surface collection channel velocities averaged 1.6 feet per second.

Auxiliary Water Supply System: For the report week, the PUD turbine unit had no interruptions in service. Fish pumps 1 and 3 ran satisfactorily with blade angles of 30 degrees. Pump 2 remains out of service for major overhaul which will require a contract for the winter of 2014–2015. The juvenile facility continues to supply the usual 450 cfs to the north powerhouse pool without any interruptions in service.

Juvenile Fish Passage Facility

The bypass season continues with alternating days of secondary and primary bypass with the switch occurring every morning at 0700 hours. There was one deviation from this schedule. On May 26, from 2034 to 2234 hours, facility staff switched the system to primary bypass mode from secondary bypass configuration after 7 turbine units suddenly ceased electrical generation (as mentioned above). The technician on duty was then able to check the juvenile collection channel for any debris issues. Only four sample events were missed as the sample rate was set at 0.5%. Secondary bypass occurred on May 24, 26 and 28. We routed 384,887 smolts and 400 juvenile lamprey to the tailrace during secondary bypass operations this week.

Descaling continues to be a concern, especially for sockeye smolts. Trash rack cleaning and removal of forebay debris is described below. Our system checks have not yet revealed a local cause for the descaling. All operations have been proceeding well. All work is being performed promptly. Repeated inspections revealed no problems. As mentioned last week, on May 23, we sent ice blocks down the full flow pipe from the collection channel to the primary bypass gate. We observed no debris. Later, we ran the sea snake camera about 275 feet from the channel into the pipe with nothing unusual observed. This is the mostly likely area for any possible blockage. On May 24, the operating project manager observed headgate positions and VBS cleaning activity

and found nothing detrimental to report. On May 29, we again examined the juvenile collection channel, which included the use of the video camera, and again, no problems were found.

As mentioned above, we are testing the units with the headgates in the stored operating position (SOG) at reduced electrical loads to see if this would reduce descaling. So far, these efforts have not demonstrated a reduction in descaling rates.

Forebay Debris/Gatewell Debris/Oil: Floating forebay debris, consisting mostly of moderate to heavy amounts of woody material, was usually located in the vicinity of the powerhouse. Project operations and weather patterns continued to affect debris location.

After much preparation, on May 29 and 30, we used a tug (also known as a "log bronc"), a second vessel and a log boom to move the debris to the spillway for removal. The debris mat did not appear to be very thick. The remaining debris load following this operation was very light.

We recorded no high trash rack differentials this week. On May 27, powerhouse crews test raked the trash racks in slots 7A and 7B. We removed two 10 cubic yard truck loads of very muddy tumbleweeds from the bottom of the racks. No fish were seen in the debris. Unit 7 has the headgates in the partially raised "pinned" position (PROG). Twelve floating smolt mortalities were noted in these gatewell slots.

We observed no unusual problems in any of the the gatewell slots.

ESBSs/VBSs: ESBSs are deployed in all operational units. Only units 4 and 11 are without ESBSs. Camera inspections were conducted May 27 in unit 8. All screens were found in satisfactory condition and no smolt mortalities were seen in these slots. Headgates in this unit are in their stored operating gate (lowered or SOG) positions. The screens in slots 7A and 13Cs remain in timer mode. On May 27, we found the screen in slot 8C "short cycling" (cleaner brush reversing direction earlier than expected). The operator subsequently recalibrated this screen.

VBS differential monitoring revealed no screens out of criteria. On May 24, we cleaned the screens in slots 6A and 7A at the request of the operating project manager. Unit 6 has the headgates in the stored operating gate (SOG or "down" position) and unit 7 has the headgates pinned in their partially raised positions ("up" or PROG). Forty-two smolt mortalities were observed, 7 in unit 6 and 35 in unit 7. On May 27, the VBS in slot 2A was replaced. VBS rehabilitations continued.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Forty-two orifices were open all week. On May 24, a partial clog was removed from the orifice in slot 8C. No fish injuries or mortalities were noted. During trash removals, VBS cleaning and VBS removals, we closed the orifices at the slots where the work was being performed and opened spare orifices in adjacent slots.

During forebay debris removal activities on May 29 and 30, we closed all orifices associated with units 8 to 14 and opened spares in units 1 to 7. This was the best way to avoid possible channel debris issues, since the debris was being removed from the middle of the powerhouse and taken

north. Water level alarms occurred during the orifice swaps, before and after the debris removal operation. On May 30, we had to switch the system into primary bypass. This development will be discussed further in next week's report. The orifice swaps occurred over periods of 4 and 2 hours respectively on May 29 and 30.

Other than the activities mention above, there were no issues within the collection channel and all systems functioned well in automatic mode. The transition screen cleaning device will remain out of service until winter.

Bypass Facility: During the bypass season, both 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 secondary bypass days.

Sample gates are in services only during secondary bypass operations (i.e.: in service every-other-day). The gates functioned well. The primary PIT tag system remains off as the bypass lines provide a better return route for the fish than the PIT tag return lines. The secondary PIT tag gates remain off and open for bypass. PSMFC personnel continue to perform weekly examinations of the PIT tag detection system.

River Conditions

River conditions during the week are outlined in Table 2 as provided by the smolt monitoring staff, whose data day runs from 0700 to 0700 hours each day. The spring spill program, which calls for 40 percent of the flow to be spilled, continued. Due to flow in excess of powerhouse capacity, 55 to 61 percent of flow was spilled this week. The TSWs remain open in bays 19 and 20. TSW removals will begin Monday, June 9, as called for in the Fish Passage Plan.

On May 29 and 30, bay 22 had its leaf split so debris could be spilled. However, the bay was not utilized. On those dates, both TSWs were closed for 5.5 and 2.0 hours, respectively for boat safety reasons. Bays 13 to 22 were closed, during this period in support of the debris spill operation.

Table 2. River conditions at McNary 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
374.5	332.5	227.7	183.9	56.2	55.5	6.0	4.5

* Control room data.

Other

Inline Cooling Water Strainers: The next cooling water strainer examination will occur June 3.

Invasive Species: The zebra mussel station examination on May 25 revealed no problems. The Oregon ladder exit received a new detection station this week.

Predatory Bird Observations: Bird counts continue with each zone being counted by the fisheries staff once a day and usually in the morning. Counts are reflected in Table 3 below.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
May 23	Forebay	0	5	0	0	10
	Spill	54	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
May 24	Forebay	0	0	0	0	17
	Spill	77	1	0	2	0
	Powerhouse	0	0	0	2	0
	Outfall	14	1	0	0	0
May 25	Forebay	0	0	0	0	23
	Spill	22	0	2	0	0
	Powerhouse	2	0	0	1	0
	Outfall	4	0	0	0	0
May 26	Forebay	0	0	0	0	39
	Spill	17	2	0	1	0
	Powerhouse	0	1	0	0	0
	Outfall	10	1	0	0	0
May 27	Forebay	0	0	0	0	32
	Spill	3	1	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
May 28	Forebay	0	0	0	0	38
	Spill	17	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	5	0	0	0	0
May 29	Forebay	0	0	2	0	42
	Spill	0	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	5	0	0	0	0

This week, we observed gulls, cormorants and pelicans on the rocks by the Washington boat dock. We also noted ospreys on project. Twelve grebes were observed in the gatewell slots. We removed nine of these birds with the remaining three passing to the collection channel, through the system and out to the lower river. We have asked USDA to increase their efforts on grebe abatement as the numbers of other bird species numbers appear to be declining as fish numbers drop. On May 28, USDA personnel utilized their boat to haze the grebes in the forebay.

USDA hazing continues with two shifts per day along with boat hazing efforts occurring on Monday, Wednesday and Friday as conditions allow. A light lethal take has begun near the bypass outfall during the boat hazing. The bird distress calls deployed along the navigation lock wing wall and around the project appear to have discouraged roosting. All hazing techniques appear to be working well as birds continue to concentrate in the spill flow. We continue to monitor the water cannon's supply pump. In June, infrasound will be tested on the project as a bird deterrent.

Research: GBT monitoring and the juvenile survival study continue. The adult lamprey passage study will begin June 15.

Project: Ice Harbor
Biologist: Ken Fone
Dates: May 23 - 29, 2014

Turbine Operation

Turbine unit 2 tripped a protective relay action at 1142 hours on May 18 and remained out of service through the end of this reporting period to allow investigation into this problem. All other units were available for service.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on May 27, 28, and 29.

Fish Ladders: The north fish ladder inspection areas (picketed leads, head differentials, fishway exit, and depth over weirs) were in criteria on all inspections. The south fish ladder inspection areas (picketed leads, head differentials, fishway exit, and depth over weirs) were in criteria on all inspections. Both the north and the south shore picketed leads are down in their deployed positions.

Fishway Entrances and Collection Channel (inspection date order): 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 on all inspections. The north shore entrance (NSE) 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.

Auxiliary Water Supply System: Two of the 3 north shore fish pumps were operated without problems. Six of 8 south fish pumps were operated.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Fish ladder exits were clear of debris and the bubblers were operating satisfactorily, except that the bubbler was off at the south ladder exit on May 27 to secure the air piping in place. There was little to no debris observed in the forebay and gatewells.

STSs/VBSs: STSs are in position for juvenile fish guidance and have been in continuous run mode since May 27. STS inspections and unit 3 VBS inspections were performed on May 19 and 21. No problems were found.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass was placed in operation on March 17. Twenty orifices are open.

Juvenile Bypass Facility: The bypass is in operation.

Fish Sampling: The first sample of the season occurred on April 2. Sampling days continue to alternate weekly on Mondays and Wednesdays, and Tuesdays and Thursdays. Sampling was scheduled on May 28 and 30 (Wednesday and Friday), because of the holiday on May 26. Sampling results are outlined in the table below for May 28.

Table 1. Fish condition sampling results at Ice Harbor Dam

May 28:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	11	0	1	0
UC-CH	6	1	0	0
C-CH-O	0	---	---	---
UC-CH-O	17	0	0	0
C-SH	55	7	0	6
UC-SH	26	2	0	4
C-COHO	0	---	---	---
UC-COHO	3	0	0	0
C-SOCK	1	0	0	0
UC-SOCK	5	0	0	0
TOTAL	124	10	1	10

Removable Spillway Weir: The RSW is in operation. Spill in support of fish passage began April 3, 2014.

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
148.7	128.4	80.7	72.4	55	54	4.0	3.4

*Unit 1 scrollcase temperature.

Other

Inline Cooling Water Strainers: Cooling water strainer inspections took place on May 19 and 21. A total of 13 juvenile lamprey mortalities and 1 juvenile coho mortality were recovered.

Invasive Species: No new exotic species have been found.

Avian Activity: Piscivorous bird hazing began on April 1. The water cannon is functioning satisfactorily. The avian deterrent program has generally been effective at reducing the numbers of piscivorous birds near the dam. Daily counts are reflected in Table 3 below.

Table 3. Daily Morning Piscivorous Bird Counts at Ice Harbor Dam

Date	Gulls	Cormorants	Caspian Terns	Pelicans	Grebes
May 23	---	---	---	---	---
May 24	2	51	0	19	0
May 25	0	30	2	70	0
May 26	---	---	---	---	---
May 27	1	13	1	15	0
May 28	0	12	2	27	0
May 29	0	23	2	22	0

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

Project: Lower Monumental
Biologists: Bill Spurgeon and K.C. Deife
Dates: May 23 - 29, 2014

Turbine Operation

The units are being operated in hard constraint of the 1% operation criteria. Unit 2 operated outside the 1% criteria on May 28 from 1109 to 1132 hour for unknown reasons. Units were rotated out of service on May 27, 28, and 29 to install cooling water sample lines.

Adult Fish Passage Facility

The adult fishways were inspected by Corps and PSMFC/State biologists on May 23, 24, 25, 26, and 28.

Fish Ladders: Fishway exit head differentials and depths over the weirs were in 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 with the exception of a 0.7 feet reading on May 24.

SPE1 and SPE2 weir gates were in depth criteria (criteria: ≥ 8' or on sill) on all inspections. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections with the exception of readings of 0.6' and 0.9 feet on May 24 and 28, respectively.

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 with the exception of a 0.9 feet reading on May 28.

The collection channel velocity remained in criteria (1.5 - 4.0 ft/sec) this week.

Any criteria violations at the fishway entrances are related to the failure of the PLC (Programmable Logic Circuit) for automated control. Without automated control, the FCRG (fishway control regulating gate) drifts closed causing the fishway entrance head to go out of criteria at the south shore entrances. Operators are manually controlling the FCRG and fish pumps to maintain head and depth criteria at fishway entrances. The loss of the fishway PLC also caused all weir gates to be placed in local control. This results in criteria violations if monitoring and adjustment does not occur as tailwater level fluctuates. To minimize this, SPE1 and SPE2 are placed on sill.

The replacement PLC for automated control of the fishway has been received. It is being currently being programmed. The automated system is estimated to return to service in June.

The operators have been instructed to conduct a physical inspection on night shift to replace the FPP inspection via data screen conducted normally on that shift.

Auxiliary Water Supply System: All AWS pumps were in service and operating throughout this period.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 6.0 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-10% surface coverage. No oil was observed in gatewells.

STSs/VBSs: STS operation remains in continuous run mode due to the average length of sampled sockeye being less than 120 mm.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel is operating with 19 to 20 orifices open.

Collection Facility: The facility is in collection for transport mode.

Transport Summary: Every-day barging occurred throughout this period.

River Conditions

River conditions during the week are outlined in Table 1. The BPA called for the use of the uniform spill pattern on May 23.

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
140.9	123.1	37.3	26.8	55.0	53.0	3.4	2.3

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on May 19. Two live lamprey and 1 live Siberian prawn were recovered. Mortalities included 9 juvenile lamprey, 35 juvenile salmon, and 1 Siberian prawn.

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

Avian Activity: Daily tailrace counts of feeding piscivorous birds are summarized in Table 2. 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. Tailrace Counts of Foraging Piscivorous Birds at Lower Monumental Dam.

Date	Time (hours)	Gulls	Cormorants	Terns
May 23	1100	6	0	0
May 24	1120	68	2	0
May 25	1120	40	0	0
May 26	1115	27	3	0
May 27	1130	5	0	0
May 28	1130	5	0	0
May 29	1115	1	1	0

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

Project: Little Goose
Biologist: Richard Weis
Dates: May 23 - 29, 2014

Turbine Operation

Turbine units 1 through 6 were available for all of this reporting period. All turbine units were operated within the 1% peak efficiency range.

Adult Fish Passage Facility

Adult fishway inspections were performed on May 25, 28 and 29.

Fish Ladder: The ladder exit head differential held steady at 0.1 feet (criteria $\leq$ 0.5 ft.). Water depths over the weirs held steady at 1.2 feet (criteria 1.0-1.3 ft.). No differential was observed at the picketed leads (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: Channel to tailwater head differentials ranged between 1.0 and 1.7 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.2 and 8.3 feet (criteria $\geq$ 8.0 ft). NPE weirs rested on sill and ranged between 6.7 and 7.2 feet (criteria $\geq$7.0 ft). NSE weirs are in manual and depths ranged between 7.0 and 7.2 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocity near the junction pool area measured 2.1 to 2.6 fps. Surface water velocity held steady at 2.4 fps near the north shore entrance (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: All fish pumps operated within criteria.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Estimated amounts of woody debris in the immediate forebay ranged between 300 and 1,000 sq ft.

Spillway Weir: The spillway weir was in service in the low crest position during this reporting period.

ESBS/VBS: All ESBS operated without problems. Drawdown measurements were performed on all units on May 29. All units met criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume: The juvenile system operated with 22 open orifices.

Transportation Facility: The collection and transportation facility operated within criteria for the report period. A total of 275,122 fish were collected for transport. Four Chinook fry were by-passed. The descaling and mortality rates were 0.8% and less than 0.1% respectively.

Transport Summary: Daily barge departures continued during this reporting period. All fish collected (except the 4 Chinook fry that were bypassed) were transported.

River Conditions

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
141.9	122.5	104.9	85.1	54.5	53.5	2.7	1.8

*Ladder temperature.

Other

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

Invasive Species: No zebra mussels were observed on the substrate monitor on May 5. The next inspection is scheduled for June 4.

Avian Activity: USDA-APHIS bird hazing was utilized all week.

Table 2. Maximum Daily Bird Counts at Little Goose Dam.

Date	Gulls	Cormorants	Caspian Terns	Pelicans
May 23	74	16	0	1
May 24	91	9	0	6
May 25	67	18	0	3
May 26	60	22	0	3
May 27	55	9	0	2
May 28	23	10	0	1
May 29	10	2	0	1

Research: The University of Idaho continued to conduct adult salmon passage and adult lamprey passage research at Little Goose.

Project: Lower Granite
Biologists: Mike Halter, Elizabeth Holdren and Ches Brooks
Dates: May 23 - 29, 2014

Turbine Operation

Lower Granite had all turbine units available for power generation at the beginning of the report period. Turbine unit 6 is out of service for turbine blade seal insection, the expected return to service date is now July 8. The turbine units are being operated in hard constraint of the 1% operation criteria.

Adult Fish Passage Facility

On May 23, 24, and 25 COE fish biologists conducted inspections of the adult fishway system.

Fish Ladder: All criteria were met.

Fishway Entrances and Collection Channel: Head differential readings remained within criteria at all adult fishway entrances during the weekly inspections.

Weir depths at the south shore fishway entrances met criteria on all inspections this week. Weir depths at the north powerhouse fishway entrances met criteria on the May 24 inspection, but were on sill during the May 23 and May 25 inspections due to tailrace elevations below 636.0 feet (at which depths the gates bottom out). Weir depths at north shore entrance 1 ranged from 5.0 to 5.4 feet (criterion $\geq$ 7.0 feet). Weir depths at north shore entrance 2 ranged from 5.2 to 5.7 feet (criterion $\geq$ 7.0 feet). North shore entrance 2 remains damaged, and cannot adjust for weir depths automatically; this gate has been manually set at a compromise depth of 630.0 feet. Due to a lack of water at the north shore entrances, weir depth readings are being sacrificed in attempt to maintain the requisite 1.0 foot of head differential.

Velocity readings in the adult fishway collection channel transition pool area ranged from 0.98 feet to 1.15 feet per second and averaged 1.07 feet per second.

Auxiliary Water Supply System: Fish pumps 1 and 3 were run during the week with fish pump 2 held in standby mode.

Juvenile Fish Passage Facility

The sample rate remained at 0.5% during the report week.

Forebay Debris/Gatewell Debris/Oil: The amount of forebay debris varied during the week due to wind strength and direction. No debris spills took place during the week. The JFF staff have

been monitoring gatewells daily and removing floating debris with a hand basket in attempt to circumvent orifice blockages.

ESBSs/VBSs: ESBSs are deployed in all units and have been operating without issue. The brush cleaning cycle is set for once every 2 hours. The first video VBS inspection of all screens was accomplished on April 25-26. No problems of note were observed.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Orifices are being backflushed every 3 hours around the clock. Debris accumulations have increased considerably during the week with the higher river flows.

Transportation Facility: Every day barge transport operations at Lower Granite began on May 2. Fish are being picked up at Little Goose and Lower Monumental on all trips. Lamprey friendly tail screens (with larger mesh openings) have been installed in all raceways.

Transport Summary: Every day fish barging operations progressed smoothly during the week. There were no serious operational problems on the barges and all fish were released at the designated sites in a timely manner. Since May 21, Little Goose fish have been loaded only into 8000 barges because of declining fish collection numbers.

Removable Spillway Weir: The RSW resumed operation with normal spring spill activities on April 3.

River Conditions

River conditions during the week are outlined in Table 1.

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
148.9	128.2	57.8	38.6	54.5	53.8	3.0	2.3

*Cooling water intake temperature.

Other

The adult fish counters began visual counts at the counting window on April 1. The counting hours are from 0400 to 2000 hours PST and are scheduled to continue through October 31.

Inline Cooling Water Strainers: Cooling water strainers were inspected for lamprey on May 27. A total of 181 dead lamprey were found in the strainers over a combined run time of 2,929.2 unit hours. The next cooling water strainer inspections are scheduled for late June.

Invasive Species: The zebra mussel substrate near the adult fishway exit was examined for zebra mussels on the May 3 inspection. No evidence of zebra mussels was found.

Avian Activity: Formal bird counts and hazing activities began on April 1. Sixteen hour per day hazing began on April 21 and will continue until June 1. This is in attempt to provide the maximum amount of hazing effort when the highest numbers of juvenile fish are passing the dam.

Table 2. Daily Average Predacious Bird Counts at Lower Granite Dam.

Date	Gulls	Cormorants	Caspian Terns	Pelicans
May 23	0	0	0	0
May 24	3	0	0	0
May 25	0.5	0	0	0
May 26	1.5	0	0	0
May 27	8	0	0	0
May 28	0.5	0	0	0
May 29	0	0	0	0

* Numbers are an average of the morning and evening counts off the JFF separator platform.

Adult Fish Trap Operations: The adult fish trap was watered up and sampling began on March 10. The initial sample rate was 28%. On April 14 at 1400 hours the sample rate was lowered to 15%. Since, as in 2013, adult trapping will only be conducted Monday thru Friday the 15% sample rate represents an overall weekly sample rate of 11%. Genetic/scale samples will be taken from one out of every 10 hatchery steelhead. All wild steelhead captured will be PIT-tagged and scale and genetic samples taken. Any previously PIT-tagged steelhead (either hatchery or wild) will have both scale and genetic samples taken for verification purposes. Up to twenty sort by code Lemhi origin Chinook will be radio-tagged and scale and genetic samples taken.

Research

Idaho Fish and Game (IDFG) Genetic Stock Identification: The goal of this study is to develop fine-scale genetic profiles for natural origin salmon and steelhead; develop genetic stock identification (GSI) techniques to estimate stock-specific escapement over LGR, monitor abundance, productivity and distribution of naturally produced adult and juvenile steelhead and salmon; research and monitor stock-specific life history characteristics. At LGR the goal of the study will be to enumerate and characterize the natural production of spring/summer Chinook salmon and steelhead above LGR with regards to age composition and genetic stock profiles. IDFG will sample Monday through Friday until the first part of July with the goal to collect between 2,000-5,000 genetic samples each from yearling spring/summer Chinook and steelhead and 500-3,000 genetic samples from subyearling fall Chinook.

Nez Perce Tribe (NPT)/U. of Idaho (UI)/Columbia River Intertribal Fisheries Commission (CRITFC) – Kelt Study: The goal of this research project is to study the physiology and endocrinology of steelhead kelts to evaluate the feasibility and success of several strategies for

rehabilitating and handling steelhead collected at LGR. Also, to understand and identify the suite of physiological changes that occurs in Snake River steelhead during the process of sexual maturity, and to determine changes that occur post spawning that are associated with successful downstream migration and recovery to spawn again. As part of this collaborative study to investigate approaches to increase adult steelhead returns the NPT will select up to 150 fish for transport to the Dworshak National Fish Hatchery holding facility.

National Marine Fisheries Service (NMFS) In-River Survival: NMFS staff continued 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 2013 in natal streams and are diverted to the Sort-By-Code tanks at LGR.

Biological Evaluation of Prototype Overflow Weir and 14 inch Orifice: A prototype broad crested overflow weir and 14 inch diameter orifice were installed into intake gatewell 5A during the winter of 2012. These structures are being evaluated by UC Davis, Biomark and Blue Leaf Environmental in order to test whether these structural modifications will reduce passage times and increase survival of fish through the upper portion of the LGR Juvenile Bypass System. Last winter a sharp crested weir was installed in place of the broad crested weir and a prototype LED light ring was installed on the 14 inch orifice. The goal of the study is to assess the biological and debris passage characteristics associated with each style of passage structure (14 inch orifice - with light ring) and 'sharp crested' overflow weir) during the day, and this year also at night. Results of this study will be used to determine whether any redesign of the weir or orifice structures is necessary and to determine which of these structures warrant installation in the remaining gatewells. This study will also help inform future management decisions for structural modifications at other Columbia and Snake River dams. Up to 375 fish of each species (clipped yearling Chinook, clipped subyearling Chinook and clipped steelhead) will be collected from the JFF east raceways during the NMFS survival and transport study sampling. These fish are PIT-tagged, photographed, evaluated for condition, held overnight and released the next morning for the day release or the next evening for the night release. The fish are released into gatewell 5A or the gallery channel. To further evaluate these structures up to 100 adult steelhead kelts and up to 2500 juvenile lamprey will be PIT-tagged and released. A subsample of each release group will be collected in the Sort-By-Code tanks and examined for injury.