U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#12-2014

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: May 16 - 22, 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. Unit outages are recorded in Table 1 below.

Table 1. Unit Outages at McNary Dam.

Units	Outage Dates	Outage Length	Reason
11	Sep 18 to Jul 31	Approx 10.5 mos.	Turbine bearing issue continues.
4	Mar 27 to Jul 31	About 4 months.	Turbine bearing issue continues.
1	May 20	3.5 hours.	ESBS in B slot replaced.
5, 6 & 7	May 20	1.6 hours total.	ESBS camera inspections.
2	May 20	3.1 hours.	VBS replaced at B slot.
2	May 21	3.3 hours.	VBS replaced at C slot.
8, 9, 10, 12 & 13	May 21	3.6 hours total.	Trash rack cleaning.
3, 6 & 12 to 14	May 22	4.3 hours total.	Trash rack cleaning.

Adult Fish Passage Facilities

On May 16, 19 and 20, the McNary fisheries biologist performed measured inspections of the adult fishways. Visual adult fish counting continues.

Fish Ladders Exits: During measured inspections, both ladder exits met all Fish Passage Plan criteria except on May 20, when the Washington exit head over weir differential measured 1.4 feet. A set point adjustment was requested.

Debris loads remained low near the exits. However, the Washington exit generally has more debris, with tumbleweeds being an issue at times. From May 16 to 20, the Washington exit picketed lead hoist was out of service due to electrical issues. Fortunately, the hoist was not needed. The fisheries staff is checking the exits on all shifts when the juvenile system is in primary bypass.

At the Oregon exit, our differential monitoring of the traveling screens revealed no problems. Although no debris appears to be present, differential alarms continued to occur at this location. All alarms were reset without incident.

Fishway Entrances and Collection Channel: At the Washington ladder entrance, all inspection points were in criteria. Occasionally, both weirs have a very slight amount of slack in their cables. Slack occurs most often at W3's south cable. In the near future, the project will replace the LED's for W2 and W3 with a PLC, which will integrate into the new control system better.

At the Oregon ladder entrances, all inspection points were in criteria except on May 19, when the south powerhouse entrance, SFEW2, measured depths of 7.8 feet. SFEW2 continues to drift in and out of calibration. The electrical staff has laid conduit for future upgrades. We hope to complete the upgrades of the Oregon entrances in the near future. At the north powerhouse entrance, occasionally, NFEW2's south cable had a very slight amount of slack in it. Collection channel surface velocities averaged 1.5 feet per second.

Auxiliary Water Supply System: For the report period, the PUD turbine nit 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 no deviations from this schedule as secondary bypass occurred on May 16, 18, 20 and 22. We bypassed 384,887 smolts and 400 juvenile lampreys this week. Also, there was one PIT tagged bull trout detected at McNary. We did not see or handle this fish.

Descaling continues to be a concern. Trash rack cleaning is described below. Our system checks have revealed no local cause for the descaling. All operations have been going well including VBS cleaning. All work is being performed promptly. 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 observed. This is the mostly likely area for any possible blockage. On May 24, the project manager observed headgate positioning and VBS cleaning with nothing detrimental to report. Again, we cannot find a local cause for descaling.

Next week, the project will borrow Lower Granite's tug (also known as a "log bronc") and remove the floating forebay debris, which consists mostly of woody material.

Forebay Debris/Gatewell Debris/Oil: Floating forebay debris, which was woody material and tumbleweed, was moderate to heavy and was mostly at the powerhouse. Project operations, trash rack cleaning and weather patterns continue to move the debris.

On May 19 and 20, a small amount of fresh tumbleweeds arrived at the north side of the powerhouse. Trash rack cleaning over the next two days removed most of these tumbleweeds.

Our highest trash rack differential this week was 2.0 feet at slot 13A. Due to continued concerns over descaling, on May 21 and 22, the project cleaned trash racks at units 3, 6, 8 to 10 and 12 to 14, were the highest differentials were measured. We removed 15.3 ten-yard truck loads of debris, most of which was muddy tumbleweeds, which came from the bottom of the racks. On May 21, the crew worked to 1900 hours. We noted one smolt lost in the debris. We also salvaged six live juvenile lampreys and returned them to the river. No other species of interest were seen. Unfortunately, after the debris removal, descaling rates remained about the same.

We observed no problems in the gatewell slots. Woody debris that fell into the slots during trash rack cleaning will be removed.

ESBSs/VBSs: ESBSs are deployed in all operational units. Only units 4 and 11 are without ESBSs. On May 20, camera inspections at units 5 to 7 revealed no problems. During the inspections, we noted 10 lost smolts in the slots. After the inspection, we tightened the control knob for the camera's cable drum and ordered a new electrical cord.

The screens at 7A and 13C slots remain in timer mode. On May 16, the operator recalibrated screens in slots 2A and 10C slots after observing "short cycling" (i.e.: cleaner brush reversing direction earlier than expected). On May 20, the electrical staff repaired the electrical ground on the screen in slot 1C. The screen in slot 1B was replaced the same day due to screen motor failure. The replacement ESBS was previously stored in a unit 4 slot. Finally, on May 20, we found that the screen controller for unit 10 was not communicating with the screens. The electrical staff resolved the issue immediately.

VBS differential monitoring revealed no screens out of criteria. On May 22, we cleaned 3 screens as a preventative measure in slots 6B, 12B and 13B. We noted 21 lost smolts, 20 of which were from slot 12B. In addition, we observed five lost juvenile lamprey. Two live juvenile lamprey were returned to the river.

On May 20 and 21, respectively, the VBS at 2B and 2C slots were replaced with screens from unit 11, which is out of service. Both VBSs from unit 2 were taken to the yard for rehabilitation.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Forty two orifices were open all week. On May 16, unit 4 orifices returned to service and the spare orifices in unit 3 were closed. During trash removals and VBS checks, we closed the orifices in slots where work was being performed and opened spare orifices in adjacent slots. This week, the electrical switch for 4A south orifice light was replaced.

There were no issues and all systems functioned well in automatic mode. The transition screen cleaner will remain out of service until the winter maintenance period.

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 on secondary bypass days.

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

On May 19, the electrical staff examined the B side count tank's water supply actuator's indicator and found no problems. Also, that day, we removed another stick from the flume wye which had experienced debris blockage earlier this year. This week, we installed more handles on the main flume covers.

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, continues. Due to flow in excess of powerhouse capacity, 54 to 60 percent of flow was spilled this week. The TSWs remain open at bays 19 and 20.

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
349.9	270.5	199.9	152.1	55.6	54.3	6.0	6.0

*Control room data.

Other

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

Invasive Species: The next zebra mussel station examination will occur on May 25.

Avian Activity: Bird counts continued with each zone being counted by the fisheries staff once a day, usually in the morning. Counts are reflected in Table 3 below.

This week, we observed gulls and pelicans on the rock by the Washington boat dock. We also noted ospreys on project. Two grebes were observed in the gatewell slots. These birds passed to the juvenile channel and out of the system, with one being released from the separator. On May 21, we installed bird deterrent tape on the bypass pipe's handrail, which appears to have discouraged gulls from roosting there.

USDA hazing continues with two shifts along boat hazing occurring Monday, Wednesday and Friday as river 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. In June, infrasound will be test on project as a bird deterrent.

We continue to monitor the water cannon's supply pump. This week, on May 19, the sprinkler system had an outage for a few hours so we could perform maintenance on the pump.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
May 16	Forebay	0	0	0	0	12
	Spill	47	0	0	0	0
	Powerhouse	34	0	0	0	0
	Outfall	0	0	0	0	0
May 17	Forebay	0	0	0	0	17
	Spill	150	0	0	0	0
	Powerhouse	22	0	0	0	0
	Outfall	20	0	0	0	0
May 18	Forebay	1	0	0	0	15
	Spill	200	0	0	0	0
	Powerhouse	2	0	0	0	0
	Outfall	38	0	0	0	0
May 19	Forebay	0	0	0	0	21
	Spill	50	1	0	1	0
	Powerhouse	4	0	0	0	0
	Outfall	0	0	0	1	0
May 20	Forebay	0	0	0	0	30
	Spill	26	0	0	4	0
	Powerhouse	3	0	0	2	0
	Outfall	14	0	0	0	0
May 21	Forebay	0	0	0	0	7
	Spill	18	2	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	18	2	0	0	0
May 22	Forebay	0	0	0	0	7
	Spill	31	0	0	5	0
	Powerhouse	3	0	0	3	0
	Outfall	5	0	0	0	0

Research: GBT monitoring and the juvenile survival study continue. This week, trash rack cleaning damaged three survival study transducers and the contractor has asked us to notify them when trash rack cleaning is to occur.

Project: Ice Harbor
Biologist: Ken Fone
Dates: May 16 - 22, 2014

Turbine Operation

Turbine unit 2 tripped off on a protective relay action at 1142 hours on May 18 and remained out of service through the end of this reporting period to allow continued investigations. Units were taken out of service one at a time on May 19 and 21 for STS inspections.

Adult Fish Passage Facilities

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

Fish Ladders: The north fish ladder inspection areas (picketed leads, head differentials, fishway exits, and depth over weirs) were in criteria on all inspections. The south fish ladder inspection areas (picketed leads, head differentials, fishway exits, 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 the 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 operated satisfactorily, except that the bubbler was off at the south ladder exit on May 22 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 cycling mode since May 19. STS inspections were performed on May 19 and 21, with no problems 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 results are outlined in the tables below for May 20 and 22.

Table 1. Fish condition sampling results at Ice Harbor Dam

May 20:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	62	1	1	0
UC-CH	7	2	0	1
C-CH-O	0	---	---	---
UC-CH-O	5	0	0	0
C-SH	19	2	0	0
UC-SH	21	1	0	1
C-COHO	0	---	---	---
UC-COHO	10	0	0	0
C-SOCK	2	0	0	0
UC-SOCK	2	0	0	0
TOTAL	128	6	1	2

May 22:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	20	2	0	0
UC-CH	8	1	0	0
C-CH-O	0	---	---	---
UC-CH-O	1	0	0	0
C-SH	61	8	0	4
UC-SH	27	3	0	2
C-COHO	1	0	0	0
UC-COHO	6	1	0	0
C-SOCK	7	1	0	0
UC-SOCK	2	0	0	0
TOTAL	133	16	0	6

Removable Spillway Weir: The RSW is in operation position. 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
126.0	88.9	86.7	37.2	54	54	5.8	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 one 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 16	30	45	0	158	0
May 17	7	18	0	22	0
May 18*	35	115	0	14	2
May 19	25	22	2	41	0
May 20	15	49	0	20	0
May 21	46	30	1	14	0
May 22	13	24	0	13	0

*Spillway tailwater 1 and forebay zones only

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

Project: Lower Monumental
Biologists: Bill Spurgeon and K.C. Deife
Dates: May 16 - 22, 2014

Turbine Operation

The units are being operated in hard constraint of the 1% operation criteria.

Adult Fish Passage Facility

The adult fishways were inspected by Corps and PSMFC/State biologists on May 16, 17, 18, and 21.

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 0.8 feet reading on May 17.

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 0.7' and 0.7 feet on May 17 and 21, 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.

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 8.75 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-20% surface coverage. Oil was observed in gatewells 2B and 3A on May 16 and 18, respectively. The operator was notified and oil socks were deployed.

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 was operating with 19 to 20 orifices open.

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

Transport Summary: Every-day barging is occurring.

River Conditions

River conditions during the week are outlined in Table 1. The BPA implemented use of uniform spill patterns during periods when no market for electricity exists (i.e.: involuntary spill) until June 10 at 2359 hours (this date is subject to change).

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
121.0	87.3	31.2	23.5	56.0	53.5	4.0	3.3

*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 below. Gulls were the dominant species observed during inspections this week. Hazing met the standard from the avian action plan through this time period. This period is near the historic peak for juvenile fish passage (approximately May 12) and should represent the high numbers of birds encountered.

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

Date	Time (hours)	Gulls	Cormorants	Terns
May 16	1100	33	1	0
May 17	1100	17	0	0
May 18	1100	14	4	0
May 19	1100	32	1	0
May 20	1100	6	0	0
May 21	1100	13	1	0
May 22	1100	12	1	0

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

Project: Little Goose
Biologist: James Brandon
Dates: May 16 - 22, 2014

Turbine Operation

Turbine units 2 through 5 were available for all of this reporting period. Unit 1was brought back in service on May 16 at 1058 hours, after a large tear was fixed on a VBS screen in slot 1A. Unit 6 was out of service from 0345 to 0930 hours on May 22 due to a faulty oil thrust bearing pump. All turbine units were operated within 1% peak efficiency range.

Adult Fish Passage Facility

Adult fishway inspections were performed on May 19, 21 and 22.

Fish Ladder: The ladder exit head differential ranged between 0.0 and 0.1 feet (criteria $\leq$ 0.5 ft.). Water depths over the weirs ranged between 1.1 and 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 1.8 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.0 and 8.7 feet (criteria $\geq$ 8.0 ft). NPE weirs rested on sill and depths ranged between 5.8 and 6.2 feet (criteria $\geq$7.0 ft). NSE weirs remain in manual mode and depths ranged between 6.1 and 6.3 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocities near the junction pool area measured from 1.9 to 2.2 fps. Surface water velocities ranged between 2.0 and 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 100 and 300 sq ft.

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

ESBS/VBS: All ESBSs operated without any problems. Monthly ESBS brush motor tests were performed on May 22 on screens in slots 1A through 1C. All brush motors operated within criteria. Drawdown measurements across trash racks and ESBS for turbine units 1 – 4 were performed on May 22, all criteria were met.

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 447,160 fish were collected for transport. Two Chinook fry were by-passed. The descaling and mortality rates were 1.2% and less than 0.1%, respectively.

Transport Summary: Every day barging continued during this reporting period. All fish collected except for the 2 Chinook fry (mentioned above) 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
119	84	37.0	28.1	56.2	53.8	4.4	3.4

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were checked on May 21. One salmonid and 9 juvenile lamprey were removed.

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
5/16	107	8	0	4
5/17	189	14	0	14
5/18	207	15	0	9
5/19	211	14	0	0
5/20	117	13	0	8
5/21	72	9	0	4
5/22	65	9	0	7

Research: The University of Idaho continued adult salmon passage and adult lamprey passage study are in effect at Little Goose.

Project: Lower Granite
Biologists: Mike Halter, Elizabeth Holdren and Ches Brooks
Dates: May 16 - 22, 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 June 5. The turbine units are being operated in hard constraint of the 1% operation criteria.

Adult Fish Passage Facility

On May 16, 17, and 19 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 the south shore and north powerhouse fishway entrances during the weekly inspections. Head differential readings at the north shore fishway entrances were out of criteria on the May 16 and May 17 inspections with readings of 0.8 feet and 0.9 feet, respectively (criterion 1.0' – 2.0'). On May 19 the head differential reading met criteria with a reading of 1.0 feet. These out of criteria events at the north shore are associated with the fact that fish pump 1 is now being run in 'slow' speed mode. Fish pump 1's motor management relay system has a tendency to trip the pump offline when the pump is running in 'fast' speed mode during low tailwater conditions (the pump requires up to an hour to restart).

Weir depths at the south shore fishway entrances met criteria on all inspections this week. Weir depths at the north powerhouse fishway entrances were on sill all week due to tailrace elevations below 636.0 feet (at which depths the gates bottom out). Weir depths at the north powerhouse entrances ranged from 6.4 to 7.3 feet. Weir depths at north shore entrance 1 ranged from 5.0 to 5.1 feet (criterion $\geq$ 7.0 feet). Weir depths at north shore entrance 2 ranged from 4.3 to 5.1 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 1.04 to 1.16 feet per second and averaged 1.09 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 was decreased from 1.0% to 0.5% at 0700 hours on May 18 and remained at that level for the duration of the report week. Daily fish collection numbers trended upward toward the mid part of the week and ranged from a high of 140,000 on May 19 from a low of 25,602 on May 15.

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. 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. The 42-inch controller valve on the separator quit working early on the morning of March 24. Powerhouse electricians traced the problem to a bad transformer and replaced it on May 13. The valve is now fully functional.

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. Until May 21, fish collected at Little Goose have been directly loaded into 2000 and 4000 series barges whenever possible. Since May 21, Little Goose fish have been loaded only into 8000 barges because of declining fish collection numbers.

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. Fish numbers increased, which is typical as Lower Granite Dam normally sees a smaller second peak in fish numbers during mid-May. Due to lower overall fish collection numbers at Little Goose, the smaller fish barges (utilized for direct-loading operations at Little Goose) are being taken off line and returned to Lower Granite.

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 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
124.4	88.0	36.8	20.6	54.7	53.8	4.8	3.2

*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 last inspected for lamprey on April 28. A total of 5 lamprey mortalities were found in the strainers over a combined run time of 2,988.5 unit hours. The next cooling water strainer inspections are scheduled for late May.

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. Count results are outlined in table 2 below.

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

Date	Gulls	Cormorants	Caspian Terns	Pelicans
May 16	0	0	0	0
May 17	3	0	0	0
May 18	0	0	0	0
May 19	8.5	0	0	0
May 20	0	0	0	0
May 21	0	0	0	0
May 22	0.5	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 20 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: This week, NMFS staff began 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.