U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#08-2014

Project: McNary
Biologists: Carl Dugger and Bobby Johnson
Dates: April 18 - 24, 2014

Turbine Operation

McNary had 10 to 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.

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.
10	Apr 14 to 18	About 4 days.	Wicket gate packing and brush bar retrieval.
9	Apr 21 to 22	26.3 hours.	Hydraulic fluid leak in slots A & B.

Adult Fish Passage Facilities

On April 18, 22 and 23, the McNary fisheries biologist performed measured inspections of the adult fishways. Visual adult fish counts continued.

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 Washington exit experienced one low water weir alarm on April 22, which the operator reset without incident. Oregon exit traveling screen differentials were satisfactory this week. Even so, six differential alarms did occur at this exit during this report period. The operator reset all alarms without incident.

Fishway Entrances and Collection Channel: At the Washington ladder entrance, all inspection points were in criteria. Project personnel will replace the W2 and W3 LEDs with a PLC (Programmable Logic Circuit), which will integrate into the new control system better.

At the Oregon ladder entrances, all inspection points were in criteria. Also, all weirs appear to be maintaining calibration. We hope to complete the electrical upgrades of the Oregon entrances in the near future. Surface collection channel velocities averaged 1.0 feet per second possibly due to gradients produced by higher tailwater elevations.

Auxiliary Water Supply System: For the report week, the PUD turbine unit 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 were no deviations from this schedule as secondary bypass occurred on April 18, 20, 22 and 24. We bypassed 139,853 smolts and 350 juvenile lamprey this week.

On April 20, the sample gates were inadvertently left off for 22 minutes, with one to two samples being missed. Sample rates at the time were set at one percent.

On April 21, at 1100 hours, while in primary bypass, we found the return to river line overflowing just downstream of the barge/bypass gate. First, we had to reduce and stabilize the flow as a large number of fish had swum up from the secondary bypass line to the barge drier. Next, we had retrieve 133 lost in various degrees of stress from the barge dock and rip-rap. At 1200 hours, we released the sample raceway out the barge boom, avoiding the secondary bypass line. Around 1300 hours, a camera revealed the junction of the secondary bypass and the return to river lines was fully blocked with debris. We broke two plungers in an attempt to remove the debris. At 1400 hours, our next step was to open the top of the pipe, at which time; we removed the debris, which consisted of woody material with pieces of tumbleweed. (The above mortality total includes fish removed from the debris). We also retrieved our two plungers. By 1700 hours, a hatch was installed to cover the opening and allow future inspections of this junction.

With the start of the sample season, it was difficult to determine when the debris blockage may have begun to form. The last sample raceway release on April 20, before the blockage, gave no indication of an issue. The only observation we had made earlier was the flow at the barge drier appeared higher than last season but this could have been due to facility configuration changes made in the off season.

On April 22, a district engineer examined the junction area for possible improvements as this has been an area of concern for the project. He stated that the new access area was structurally sound.

We propose extending the sides of the flume with perforated plate so excess water can flow out yet fish will remain in the flume. Also, the staff has been reminded to increase monitoring of this location and begin examinations at the new access hatch.

Forebay Debris/Gatewell Debris/Oil: Moderate to heavy floating forebay debris accumulations were evident this week, mostly in front of the powerhouse. Project operations, trash rack cleaning and weather patterns have moved the debris somewhat. The debris is composed mostly of woody material. For now, the volume of incoming debris has decreased. No trash raking

occurred this week. The next cleaning is scheduled for May. Trash rack differential readings revealed no problems.

For the week, we observed one problem in the gatewell slots. From April 21 to 22, project staff removed hydraulic fluid from slots 9A and 9B with absorbent pads and booms.

ESBSs/VBSs: ESBS are currently deployed in all operational units. Only units 4 and 11 are without ESBSs. Camera inspections will begin in mid May. The screen in slot 13C remains in timer mode. On April 20, the screen in slot 8C triggered an alarm and was recalibrated. On April 22, the ESBS in slot 1A also triggered an alarm and was reset. On April 23, unit 6's panel view flickered but remained operational.

VBS differential monitoring revealed no screens out of criteria and we cleaned none. The new headgate positioning begun this year appears to have reduced the turbine boil in the slots, which in turn may reduce the frequency of VBS cleaning.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Forty two orifices were open all week. Unit 4 orifices remain closed with makeup orifices open at unit 3. From April 21 to 22, unit 9 orifices were closed to avoid the spread of hydraulic fluid. We saw none elsewhere. Spare orifices were opened at unit 10 to maintain channel elevation.

All systems functioned well in automatic mode. The transition screen cleaning device will remain out of service until winter crews can perform maintenance.

Bypass Facility: During the bypass season, both bypass modes return all fish 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.: in service every-other-day). The gates functioned well. The primary PIT tag system remains off, as the bypass lines provide a better route for the fish than the PIT tag return lines. The secondary PIT/bypass gates remain off and open for bypass. PSMFC personnel continue to perform weekly examinations of the PIT 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, continues. Due to flow in excess of powerhouse capacity, 41 to 50 percent of flow was spilled this week. Both TSWs remain open.

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
260.5	248.1	127.7	104.2	47.9	47.3	5.2	5.0

*Control room data.

Other

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

Invasive Species: A zebra mussel station examination performed April 23 revealed no problems.

Avian Activity: Bird counts continue 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, pelicans, and cormorants on the rock by the Washington boat dock. We also noted ospreys on project. The one grebe in the gatewell slot passed to the collection channel. The two grebes reported in the collection channel last week passed out of the system.

USDA hazing continues and bird distress calls remain deployed. On April 20, the second shift for hazing began. April 20 also marked the start of boat hazing which will take place as conditions allow up to three days a week. The actual first day of boat hazing was on April 23. The fisheries staff continues to monitor the bird cannon pump for leaks and other issues. We observed that the lower seal had failed again. On April 21, after a brief outage of the sprinkler, district and project personal determined the pump could be used until the contractor returned to project to repair it.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
Apr 18	Forebay	0	0	0	0	42
	Spill	5	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Apr 19	Forebay	0	0	0	0	0
	Spill	4	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	0	0	0	0	0
Apr 20	Forebay	0	0	0	0	0
	Spill	17	0	0	2	0
	Powerhouse	0	0	0	0	0
	Outfall	14	0	0	0	0
Apr 21	Forebay	0	0	0	0	0
	Spill	29	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	5	0	0	0	0
Apr 22	Forebay	0	0	0	0	1
	Spill	42	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	6	0	0	0	0
Apr 23	Forebay	0	0	0	0	2
	Spill	29	0	0	0	0
	Powerhouse	0	0	0	1	0
	Outfall	0	0	0	1	0
Apr 24	Forebay	1	1	0	0	1
	Spill	11	0	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	1	0	0	0	0

Research: GBT (Gas Bubble Trauma) monitoring continues. On April 20, the GBT flush line pump failed. PSMFC staff carried the fish to be examined in buckets from the separator to the wet lab. COE staff restarted the pump the next day. Preparations for the juvenile survival study continued, with the first releases slated to begin on May 1.

Project: Ice Harbor
Biologist: Mark Plummer
Dates: April 18 - 24, 2014

Turbine Operation

All turbine units 1 – 6 were available for service. Two turbine units at a time were taken out of service for short periods each day April 21, 22, and 23 for STS inspections. Turbine unit 1 was out of service April 21 from 0658 hours to 1630 hours to repair a malfunctioning STS.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways April 21, 22, and 23.

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 deployed in their down positions.

Fishway Entrances and Collection Channel (inspection date order): The south shore entrance (SFE) and channel/tailwater differential were in criteria on all inspections. The north powerhouse entrance (NFE) and channel/tailwater differential were in criteria on all inspections. The north shore entrance (NSE) and channel/tailwater differential were in criteria on all inspections, except on April 23. On this inspection, the north shore channel was at 2.1 feet differential due to the entrance weir being on sill. Fishway entrance criterion is 8 feet depth, greater than 8 feet depth, 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 are in service. All south fish pumps are available for operation.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: Fish ladder exits are clear of debris and the bubblers are operating satisfactorily.

STSs/VBSs: STSs are in position for juvenile fish guidance. These screens began the week in cycle run mode. Continuous run mode was initiated April 21. STS inspections were performed April 21, 22 and 23. The STS in Slot 1 C was found detached from the cross bar. Cooling water strainer inspections were completed at the same time.

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

Juvenile Bypass Facility: The bypass is in operation.

Fish Sampling: The first sample took place April 2. Sampling results are outlined in the tables below for April 22 and April 24. Sampling days continue to alternate weekly on Mondays and Wednesdays, and Tuesdays and Thursdays.

Table 1. Fish Sampling:

April 22:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	28	2	0	1
UC-CH	39	3	0	0
C-CH-O	---	---	---	---
UC-CH-O	---	---	---	---
C-SH	37	2	0	4
UC-SH	10	0	0	0
C-COHO	---	---	---	---
UC-COHO	2	---	---	---
C-SOCK	---	---	---	---
UC-SOCK	6	1	0	0
TOTAL	122	8	0	5

April 24:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	25	1	0	0
UC-CH	37	1	0	0
C-CH-O	---	---	---	---
UC-CH-O	---	---	---	---
C-SH	57	3	0	1
UC-SH	9	1	0	0
C-COHO	---	---	---	---
UC-COHO	1	0	0	0
C-SOCK	---	---	---	---
UC-SOCK	5	0	1	0
TOTAL	134	6	1	1

Removable Spillway Weir: The RSW is in operating configuration. 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
83.8	70.9	58.2	52.9	50	50	5.2	4.8

*Unit 1 scrollcase temperature.

Inline Cooling Water Strainers: Cooling water strainer inspections took place on April 21, 22 and 23. One lamprey mortality and on juvenile Chinook mortality were recovered from unit 5. No other fish were found. Combined unit run times totaled 2,050.1 hours.

Invasive Species: No new exotic species have been found.

Avian Activity: Bird hazing began April 1. The water cannon is functioning satisfactorily. Daily counts are reflected in Table 3 below.

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

Date	Gulls	Cormorants	Caspian Terns	Pelicans
Apr 18	12	31	2	12
Apr 19	NA	NA	NA	NA
Apr 20	20	11	1	0
Apr 21	10	12	0	0
Apr 22	24	12	1	0
Apr 23	20	22	0	1
Apr 24	8	19	0	0

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

Project: Lower Monumental
Biologist: Bill Spurgeon
Lead Biological Science Technician: K. C. Deife
Dates: April 18 - 24, 2014

Turbine Operation

The units are being operated in hard constraint of the 1% operation criteria. Unit 5 began 48 hour post-outage testing at 1232 hours on April 22. Unit 5 was removed from service at 1300 hours on October 29 for 6 Year Overhaul/Thrust Bearing Replacement with an estimated return to service date of April 25, 2014.

Adult Fish Passage Facility

The adult fishways were inspected by Corps and PSMFC/State biologists on April 18, 19, 20, 21, and 23.

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.

SPE1 and SPE2 weir gates were in depth or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 7.7', 6.8, 6.8', 6.5', and 6.6 feet. South powerhouse channel/tailwater head was in criteria (1'-2') on all inspections.

SSE1 weir gate was in depth or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 7.0, 7.4', 7.1', and 7.0 feet. SSE2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head was in criteria (1'-2') on all inspections.

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.

A replacement for the PLC for automated control of the fishway has been ordered. Upon arrival it will require programming prior to returning to service. The automated system is estimated to return to service in May. 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 0.0 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-15% surface coverage. Oil was observed in gatewell 2C at 1015 hours on April 20. The operator stated oil may occur after a rain storm (i.e.: runoff from road deck). During a subsequent observation at 1215 hours on April 20, no oil was observed in gatewell 2C.

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 orifices open.

Collection Facility: Collection for condition sampling began on April 1. Subsequent collection for condition monitoring will occur every third day. Twenty-four hour sampling is scheduled to begin at 1500 hours on April 28 in secondary bypass operation. Collection for transport is scheduled to begin at 0700 hours on May 1.

Transport Summary: Fish transport is not occurring at this time. Every-day barging is scheduled to begin on May 2.

River Conditions

River conditions during the week are outlined in Table 1. Spring spill operation was initiated at 0001 hours on April 3.

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
82.5	69.1	29.9	29.6	50.0	49.0	3.5	2.2

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on April 2. No live lamprey were recovered. Mortalities included 108 juvenile lamprey and 40 juvenile shad.

Invasive Species: No zebra mussels were observed at the monitoring stations on April 4.

Avian Activity: Daily tailrace counts of feeding piscivorous birds are summarized in Table 2. Gulls were the dominant species observed during inspections this week.

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

Date	Time (hours)	Gulls	Cormorants	Tern
Apr 18	1110	16	0	0
Apr 19	1100	7	0	0
Apr 20	1105	15	0	0
Apr 21	1100	9	4	0
Apr 22	1100	18	3	0
Apr 23	1100	11	0	0
Apr 24	1110	8	2	0

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

Project: Little Goose
Biologist: Richard Weis
Lead Biological Science Technician: James Brandon
Dates: April 18 - 24, 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 April 20, 22 and 24.

Fish Ladder: The ladder exit head differential ranged between 0 and 0.1 feet (criteria $\leq$ 0.5 ft.). Water depths over the weirs held steady at 1.1 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 8.1 and 8.4 feet (criteria $\geq$ 8.0 ft). NPE weirs were on sill and held steady at 5.7 feet (criteria $\geq$7.0 ft). NSE weirs are in manual and depths ranged between 6.1 and 6.3 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocities ranged from 1.5 and 1.8 fps near the junction pool and ranged from 2.6 to 2.8 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: Woody debris in the immediate forebay ranged between 100 and 400 sq ft.

Spillway Weir: The spillway weir began the week in the high crest configuration. On April 24, the spillway weir was closed at 0730 hours to switch from high crest to low crest configuration. Due to winds in excess of 20 mph the operation was suspended. The weir remained closed until April 25 at 1010 hours (after the close of this report period), at which point the low crest weir could be safely installed and spill resumed. The other spill bays were operated in accordance with the Fish Passage Plan during the closure.

ESBS/VBS: All ESBSs operated as designed. Drawdown measurements were performed on Units 1, 2 and 3 on April 23. All criteria were met.

Orifices, Collection Channel, Dewatering Structure, and Flume: The Juvenile Bypass System operated with 22 open orifices.

Transportation Facility: The Juvenile Bypass System was switched from primary bypass to secondary bypass on April 21 for a 24 hour sample. Total collection was 186, 507 with a descaling rate of 0.9% and mortality rate of less than 0.1%. GBT (Gas Bubble Trauma) inspections showed no signs of trauma.

Transport Summary: Collection for fish transport is scheduled to begin May 1st. The first barge departure is scheduled for May 2.

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
75.6	69.9	24.1	21.3	48.8	48.3	4.2	3.8

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were checked on April 23. Six juvenile salmonids were removed.

Invasive Species: No zebra mussels were observed on the substrate monitor during the April 20 inspection. The next inspection is scheduled on May 5.

Avian Activity: USDA-APHIS bird hazing was utilized all week. Daily maximum bird counts are shown in Table 2 below.

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

Date	Gulls	Cormorants	Caspian Terns	Pelicans
Apr 18	33	10	0	0
Apr 19	38	27	0	0
Apr 20	76	34	0	0
Apr 21	90	38	0	0
Apr 22	53	32	0	0
Apr 23	59	29	0	0
Apr 24	37	18	0	0

Research: University of Idaho has resumed adult salmon and steelhead monitoring.

Project: Lower Granite
Biologists: Mike Halter and Ches Brooks
Dates: April 18 - 24, 2014

Turbine Operation

Lower Granite had all turbine units available for power generation during this report period. The turbine units are being operated within the hard constraint 1% operational criteria.

Adult Fish Passage Facility

On April 18, 19, and 20 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. The head differential readings at the north shore fishway entrances were out of criteria on the April 19 and April 20 inspections with readings of 0.8 feet and 0.9 feet, respectively (criterion 1.0' – 2.0'). These out of criteria events 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 5.9 to 6.2 feet. Weir depths at north shore entrance 1 ranged from 4.6 to 5.0 feet (criterion $\geq$ 7.0 feet). Weir depths at north shore entrance 2 ranged from 3.8 to 4.1 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 1.06 to 1.18 feet per second and averaged 1.12 feet per second.

Auxiliary Water Supply System: Fish pumps 1 and 2 were run until 1234 hours on April 21 when, as planned, the pumps were taken offline in order to attempt a restart of fish pump 3. The restart was successful and at 1326 hours fish pumps 1 and 3 were in operation. Fish pump 2 is now in standby.

Juvenile Fish Passage Facility

The sample rate remained at 0.5% during the report week. All fish other than sample fish and research fish are being diverted back to the river via the long outfall pipe (secondary bypass).

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 to circumvent orifice blockages.

ESBSs/VBSs: ESBSs are deployed in all units and have been operating without any difficulties. The brush cleaning cycle is set for once every 2 hours. The first video inspection is scheduled for April 25-26.

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 have traced the problem to a bad transformer and have one on order. At the present time, separator personnel are manually operating the valve (when needed) with a drill attached to the hand crank on the operator.

Transportation Facility: The juvenile collection gallery was watered up at 0800 hours on March 20. The separator was also watered up and all juvenile fish (other than sample fish) are being diverted back to the river through the long bypass pipe (secondary bypass). The upstream raceways are watered up to support NOAA-Fisheries Survival Study tagging operations and in anticipation of the start of barging operations.

Transport Summary: General fish barging is scheduled to begin on May 2. The first research barge was scheduled to depart on April 10 but did not due to the Little Goose navlock outage. The Little Goose navlock returned to service at 1800 hours on April 21 and the only research barge of the season will leave Lower Granite the morning of April 25.

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
77.7	70.2	24.8	20.4	50.1	49.1	4.2	3.5

*Cooling water intake temperature.

Other

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

Invasive Species: The zebra mussel substrate near the adult fishway exit was last examined for zebra mussels on the April 6 inspection. No evidence of zebra mussels was found.

Inline Cooling Water Strainers: Cooling water strainers were last inspected for lamprey on March 26. A total of 473 lamprey mortalities were found in the strainers over a combined run time of 2,840.4 unit hours. The next cooling water strainer inspections are scheduled for late April.

Avian Activity: Formal bird counts and hazing activities began on April 1.

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

Date	Gulls	Cormorants	Caspian Terns	Pelicans
Apr 18	3	0	0	0
Apr 19	14	0	0	0
Apr 20	2	0	0	0
Apr 21	2	0	0	0
Apr 22	0.5	0	0	0
Apr 23	3.5	0	0	0
Apr 24	1	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: 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 150 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.