**U.S. ARMY CORPS OF ENGINEERS**
**WALLA WALLA DISTRICT**
**FISH FACILITIES WEEKLY REPORT**
**#06-2014**

**Project: McNary**
Biologists: Carl Dugger and Bobby Johnson
Dates: April 4 - 10, 2014

## Turbine Operation

McNary had 11 to 12 units available for power generation this week. On April 1, the hard one percent constraint criteria began. Unit 3 ran briefly outside the criterion on April 7, as part of testing before returning to service. Unit outages are recorded in Table 1.

Table 1. Unit Outages at McNary Dam.

| Units | Outage Dates | Outage Length | Reason |
|---|---|---|---|
| 3 | Jun 4, 2013 – Apr 8, 2014 | About 10 months. | Thrust bearing issue resolved. |
| 11 | Sep 18 – Unknown | Unknown. | Turbine bearing issue continues. |
| 4 | Mar 27 – Unknown | Unknown. | Turbine bearing issue continues. |
| 7, 9 & 10 | Apr 4 | 7.5 hours total. | Trash rack cleaning. |
| 1 & 2 | Apr 7 | 9.7 hours total. | ESBS installation & maintenance. |
| 10 & 12 | Apr 8 | 8.5 hours total. | ESBS installation & maintenance. |
| 12 | Apr 8 | 2.3 hours. | Thrust bearing strainer. |
| 5 & 6 | Apr 9 | 10.8 hours total. | ESBS installation & maintenance. |
| 7 & 8 | Apr 10 | 10.3 hours total. | ESBS installation & maintenance. |

## Adult Fish Passage Facilities

On April 4, 6 and 9, the McNary fisheries biologist performed measured inspections of the adult fishways. Visual adult fish counts continued. On April 4 and 6, we noted vibrations coming from the prototype lamprey weir at SFEW2. Project, district and regional staffs are looking into the issue with a meeting scheduled for April 14.

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. On April 6, Washington exit weir 339 triggered and alarm once and the operator reset it without incident. Oregon exit traveling screen differentials were satisfactory. One differential alarm did occur at this exit this week which the operator reset without incident.

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

All week, at the Oregon ladder, north powerhouse entrances, NFEW2 and NFEW3 measured depths of 7.8 and 7.9 feet. South powerhouse entrances, SFEW1 and SFEW2 measured depths ranging from 7.3 to 7.6 feet. The pool differentials remained in criteria. Project personnel are examining all sensors for calibration drifts and potential programming issues. Facility staff learned this week that the electrical upgrades at the Oregon entrances have not yet been completed as parts are on order. 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 operated satisfactorily with blade angles of 30 degrees without any interruptions in service. 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 supplying the usual 450 cfs to the north powerhouse pool, also without any interruptions in service.

## Juvenile Fish Passage Facility

On April 6, the spring fish passage season began 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 April 6, 8 and 10 as planned. We bypassed 1,082 smolts and 90 juvenile lamprey through the secondary bypass on sample days this week.

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.

On April 4, trash racks associated with units 7, 9 and 10 were raked. The amount of debris and any fish loss were included in last week's report. The initial trash rack cleaning operation for the 2014 season is now completed. Trash rack differential readings revealed no problems.

No problems were observed in the gatewell slots this week.

ESBSs/VBSs: From April 7 to 10, ESBSs were installed in units 1, 2, 5 to 8, 10 and 12. The project will complete ESBS installations in all operational units by April 15. All deployed ESBSs operated satisfactorily. Camera inspections will begin about one month after installation are completed. VBS differential monitoring resumed April 7. We observed no problems.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: Forty two orifices were open all week. Unit 4 orifices remain closed to preclude oil residue from entering the collection channel. Makeup orifices were opened in unit 3 to maintain collection channel elevations. One obstruction (each) was removed from orifices 2B south and 6B south. No harm to fish was noted. On April 9, we noted that 6B south orifice had an older style of orifice cover, which is not attached as well as the newer design so we closed 6B south and opened the north orifice. This cover will be replaced in the winter.

Trash rack cleaning did improve orifice flows. During raking operations, orifices in the affected slots were closed, and make-up orifices were opened in adjacent slots to maintain collection channel elevations.

During the week, several orifice actuators underwent maintenance. All other systems functioned well in automatic mode. The transition dewatering screen cleaner will remain out of service until winter.

Bypass Facility: On April 6, at 0700 hours, the first day of secondary bypass began. During the bypass season, both bypass modes return all fish are to the river. PIT tag detection will occur in the full flow pipe during primary bypass and throughout the facility during secondary bypass. Smolt monitoring will occur 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 lines. On April 8, PSMFC preformed a test of the PIT system. The secondary PIT/bypass gates remain off and open for bypass.

The week, we fixed the separator building doors and repaired an air leak at raceway 8.

## 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. Involuntary spill occurred until April 10 at 0001 hours, when the spring spill program began with 40 percent of flow being passed. At times, the spill pattern was altered in support of navigation. On April 4, TSW2 in bay 20 was opened and included in the pattern. On April 9, TSW1 was installed in bay 19 and also opened. TSW1 is attached to a spillway crane to facilitate 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 |
| 231.4 | 206.7 | 93.0 | 68.4 | 46.8 | 44* | 5.2 | 4.2 |

*Control room data.

## Other

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

Invasive Species: The next the zebra mussel station examination will occur in late April.

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

Table 3. McNary Project's Daily Avian Count.

| Date | Zone | Gull | Cormorant | Tern | Pelican | Grebe |
|---|---|---|---|---|---|---|
| Apr 4 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 0 | 2 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 5 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 0 | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 6 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 1 | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 7 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 0 | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 8 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 0 | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 9 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 0 | 1 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 10 | Forebay | 0 | 0 | 0 | 0 | 8 |
| | Spill | 0 | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |

This week, we observed an occasional gull, grebe, pelican, osprey, tern or cormorant near the project during other inspections. We are also beginning to observe gulls and cormorants on the rocks by the Washington boat dock. USDA hazing continues and the bird distress calls remain deployed. On April 7, the contractor returned to the project and repaired the water cannon pump. The fisheries staff subsequently found and repaired another oil leak at the water cannon pump on April 9. This pump outage lasted only a few hours.

Research: GBT (Gas Bubble Trauma) monitoring will begin next week. Also, preparations continue for the juvenile survival study. SFEW2 lamprey weir adjustments and testing are also planned in the near future.

**Project: Ice Harbor**
Biologist: Mark Plummer
Dates: April 4 - 10, 2014

## Turbine Operation

All turbine units 1 – 6 were available for service.

## Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways April 8, 9, and 10.

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 during 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 was in criteria on all inspections. The north powerhouse entrance (NFE) and channel/tailwater differential was in criteria on all inspections. The north shore entrance (NSE) and channel/tailwater differential was in criteria on all inspections. 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 any difficulties. Six of 8 south fish pumps are in service. All south fish pumps are available for service.

## 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 their deployed positions for juvenile fish guidance and are in cycle run mode.

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 8 and April 10. Sampling days continue to alternate weekly on Mondays and Wednesdays, and Tuesdays and Thursdays.

April 8:

| Species | Sampled | #Descaled | Mortalities | Avian Marks |
|---|---|---|---|---|
| C-CH | 2 | 0 | 0 | 0 |
| UC-CH | 33 | 2 | 0 | 1 |
| C-CH-O | --- | --- | --- | --- |
| UC-CH-O | --- | --- | --- | --- |
| C-SH | 5 | 0 | 0 | 1 |
| UC-SH | 6 | 0 | 1 | 0 |
| C-COHO | --- | --- | --- | --- |
| UC-COHO | --- | --- | --- | --- |
| C-SOCK | --- | --- | --- | --- |
| UC-SOCK | 5 | 1 | --- | 1 |
| TOTAL | 51 | 3 | 1 | 3 |

April 10:

| Species | Sampled | #Descaled | Mortalities | Avian Marks |
|---|---|---|---|---|
| C-CH | 5 | 0 | 0 | 0 |
| UC-CH | 44 | 3 | 0 | 1 |
| C-CH-O | --- | --- | --- | --- |
| UC-CH-O | --- | --- | --- | --- |
| C-SH | 35 | 3 | 1 | 3 |
| UC-SH | 17 | 0 | 0 | 0 |
| C-COHO | --- | --- | --- | --- |
| UC-COHO | --- | --- | --- | --- |
| C-SOCK | --- | --- | --- | --- |
| UC-SOCK | 7 | 1 | --- | 1 |
| TOTAL | 108 | 7 | 1 | 5 |

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

## River Conditions

River conditions during the week are outlined in Table 1.

Table 1. River conditions at Ice Harbor Dam.

| Daily Average River Flow (kcfs) | | Daily Average Spill (kcfs) | | Water Temperature* ($^{o}$F) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 88.0 | 69.0 | 59.4 | 49.8 | 48 | 46 | 5.2 | 4.5 |

*Unit 1 scrollcase temperature.

## Other

Inline Cooling Water Strainers: Cooling water strainer inspections took place on March 24 and 25. A total of 379 lamprey were recovered, of which 2 were found live and the rest were mortalities. Unit 6 was out of service and not inspected. Combined unit run times totaled 2,944.5 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 2 below.

Table 2. Daily Morning Predacious Bird Counts at Ice Harbor Dam.

| Date | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|
| Apr 4 | 3 | 7 | 3 | 0 |
| Apr 5 | 2 | 6 | 0 | 3 |
| Apr 6 | 1 | 24 | 0 | 0 |
| Apr 7 | NA | NA | NA | NA |
| Apr 8 | 0 | 3 | 3 | 7 |
| Apr 9 | 0 | 2 | 0 | 0 |
| Apr 10 | 0 | 11 | 6 | 0 |

**Project: Lower Monumental**
Biologist: Bill Spurgeon
Lead Biological Science Technician: K. C. Deife
Dates: April 4 - 10, 2014

## Turbine Operation

The units are being operated in hard constraint of the 1% operation criteria. Unit 6 operated outside the 1% criteria on April 10 from 1542 to 1554 hours due to the XJ-6 breaker failing to open when unit 6 shut down. 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 17, 2014.

## Adult Fish Passage Facility

The adult fishways were inspected by Corps and PSMFC/State biologists on April 4, 5, 6, and 9.

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 sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 7.0', 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 sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 7.4', 7.4', 6.6', and 7.0 feet. SSE2 was in criteria (6' above sill) 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 have been 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 through this period.

## Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 303.5 square yards of forebay debris observed during this period. Gatewell debris ranged from 0-35% surface coverage. Gatewell debris was removed from units 2 and 3 on April 10. No oil was observed in the gatewells.

STSs/VBSs: STS operation was changed to continuous run mode on April 10 at 1435 hours as average fork length of sub-yearling Chinook and/or sockeye fell below 120mm.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel is operating with 18 to 19 orifices open. The primary bypass outfall water cannons were out of service from 0700 hours on April 7 to 1430 hours on April 8 due to pressure fluctuations at the nozzles. A priming problem on the pump occurred during this investigation. The problem was resolved. Alternative pumps that do not require priming are being researched.

Collection Facility: Collection for condition sampling began on April 1. Subsequent collection for fish condition monitoring will occur every third day.

Transport Summary: Fish transport is not occurring at this tiem.

## 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 |
| 85.0 | 67.6 | 29.1 | 27.9 | 47.0 | 46.5 | 3.7 | 2.8 |

*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.

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

| Date | Time (hours) | Gulls | Cormorants | Tern |
|---|---|---|---|---|
| Apr 4 | 1100 | 0 | 0 | 0 |
| Apr 5 | 1100 | 0 | 0 | 0 |
| Apr 6 | 1100 | 0 | 0 | 0 |
| Apr 7 | 1115 | 0 | 0 | 0 |
| Apr 8 | 1100 | 0 | 0 | 0 |
| Apr 9 | 1100 | 0 | 0 | 0 |
| Apr 10 | 1100 | 0 | 0 | 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 4 - 10, 2014

## Turbine Operation

Turbine units 1 through 6 were available for most of this reporting period. Unit 1 was removed from service from 0940 to 1310 hours to repair the fish screen in slot 1C on April 8. All turbine units were operated within 1% of the peak efficiency range.

## Adult Fish Passage Facility

Adult fishway inspections were performed on April 4, 5, 8 and 10.

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 1.6 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.2 and 8.6 feet (criteria $\geq$ 8.0 ft). NPE weirs were on sill and ranged from 5.6 and 5.9 feet (criteria $\geq$7.0 ft). NSE weirs were manually operated and depths ranged between 6.2 and 6.6 feet (criteria $\geq$ 6.0 ft.). Collection channel surface water velocities ranged between 1.5 and 1.9 fps near the junction pool and between 2.1 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: Woody debris in the immediate forebay ranged between 150 and 300 sq ft.

ESBS/VBS: Drawdown measurements across trash racks and ESBSs were performed on April 8 on units 1, 2, and 5 all were in criteria. ESBS 1C was found "faulted" and was pulled for repair. Screen 1C was pulled at 0930 hours and Unit 1 was returned to service at 1310 hours. The ESBS in slot 1C needed a brush cleaning motor replaced.

Orifices, Collection Channel, Dewatering Structure, and Flume: The system is operating with nineteen open orifices.

Transportation Facility: The Juvenile Bypass System was switched from primary bypass to secondary bypass on April 6 for a 24 hour sample. The fish collection totaled was 6,414 with a descaling rate of 0.2% and a mortality rate of less than 0.1%.

Transport Summary: Fish transport is scheduled to begin between April 21 and May 1.

Spillway Weir: The spillway weir is in service, configured in the high crest position.

## 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 |
| 82.6 | 67.7 | 22.8 | 20.1 | 48.5 | 46.1 | 4.2 | 2.8 |

*Ladder temperature.

## Other

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

Cooling Water Strainers Cooling water strainers were checked on April 10. Two macropthalmia lamprey were removed.

Avian Activity: Bird counting started on April 1. USDA-APHIS bird hazing started on April 7. Daily maximum bird counts are outlined in table 2 below.

Table 2. Maximum Daily Bird Counts, Little Goose Dam April 4- 10, 2014.

| Date | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|
| Apr 4 | 18 | 39 | 0 | 0 |
| Apr 5 | 38 | 82 | 0 | 0 |
| Apr 6 | 49 | 71 | 0 | 0 |
| Apr 7 | 17 | 46 | 0 | 0 |
| Apr 8 | 1 | 24 | 0 | 0 |
| Apr 9 | 3 | 29 | 0 | 0 |
| Apr 10 | 19 | 33 | 0 | 0 |

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

**Project: Lower Granite**
Biologists: Mike Halter and Ches Brooks
Dates: April 4 - 10, 2014

## Turbine Operation

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

## Adult Fish Passage Facility

On April 4, 5, 6 and 7, 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 fishway entrances during the week.

Weir depths at the south shore fishway entrances also 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 5.6 to 5.9 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 3.6 to 4.0 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 1.07 to 1.23 feet per second and averaged 1.16 feet per second.

Auxiliary Water Supply System: Fish pumps 1 and 2 were run during the week. Fish pump 1's motor manegment relay system tripped the pump offline on 3 occasions during the report week; all due to low tailwater elevations. These outages each lasted approximately fifty-four minutes – time to allow the pump to cool enough for a restart. These outages occurred on: April 6 at 1331 hours, April 7 at 1847 hours and April 9 at 1954 hours. Fish pump 3 has been repaired. It will be brought on line next week for testing.

## Juvenile Fish Passage Facility

The sample rate remained at 2% during the report week. All fish other than sample 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. The 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 issue. 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 faulty transformer and have a replacement 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" starting 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 have also been watered up to support NOAA-Fisheries Survival Study tagging operations.

Transport Summary: Nothing to report. General fish barge operations is tentatively scheduled to begin somewhere in the April 21 – May 1 time period. The first research barge was scheduled to depart on April 10, but did not due to the Little Goose navigation lock outage. At the present time, the Little Goose navigation lock is to return to service around May 1.

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 |
| 83.5 | 66.6 | 21.8 | 20.2 | 48.1 | 48.8 | 5.0 | 3.6 |

*Scrollcase 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 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.

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

Avian Activity: Formal bird counts and hazing activities began on April 1. Daily counts are outlined in table 2 below.

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

| Date | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|
| Apr 4 | 11 | 0 | 0 | 0 |
| Apr 5 | 20 | 0 | 0 | 0 |
| Apr 6 | 25 | 0 | 0 | 0 |
| Apr 7 | 22.5 | 0 | 0 | 0 |
| Apr 8 | 12.5 | 0 | 0 | 0 |
| Apr 9 | 8 | 0 | 0 | 0 |
| Apr 10 | 10.5 | 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 is 28%. Since, as in 2013, adult trapping will only be conducted Monday thru Friday the 28% sample rate represents an overall weekly sample rate of 20%. 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.

## 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.