**U.S. ARMY CORPS OF ENGINEERS**
**WALLA WALLA DISTRICT**
**FISH FACILITIES WEEKLY REPORT**
**#07-2016**

**Project: McNary**
Biologist: Bobby Johnson and Denise Griffith
Dates: April 8 - 14, 2016

## Turbine Operation

McNary had available 12 to 14 units (out of 14 total units) for power generation this week. Turbine unit outages are recorded in Table 1 below. The hard 1 percent peak efficiency constraint criteria began April 1. No turbine units ran outside the constraint.

Table 1. Unit Outages at McNary Project.

| Units | Outage Dates | Outage Length | Reason |
|---|---|---|---|
| 9 & 10 | Apr 11–14 | About 3.3 days. | Extended-length submersible bar screens (ESBSs) installed & semiannual maintenance. Also electrical bus connection related to station service upgrades contract. |
| 7 & 8 | Apr 11 | 4.5 & 5.4 hours each. | ESBSs installed & semiannual maintenance. |
| 11 & 12 | Apr 12 | 5.3 & 4.9 hours each. | ESBSs installed & semiannual maintenance. |
| 13 & 14 | Apr 13 | 5.0 & 3.9 hours each. | ESBSs installed & semiannual maintenance. |

## Adult Fish Passage Facilities

The McNary fisheries biologist performed measured inspections of the adult fishways on April 8, 11 and 14. Fisheries technicians monitored the ladders as shifts allowed. Adult fish counts resumed April 1.

Fish Ladder Exits: The head over weir criteria at both exits are to be within 1.0 to 1.3 feet. The differential criteria at the count stations are to be within 0.0 to 0.5 feet.

Debris loads were minimal at both exits except on April 8 and 9 when an influx of tumbleweeds heavily impacted the Washington exit. General maintenance staff was called in to clean the Washington exit picketed leads on April 9.

At the Washington exit, the head over weir measured 0.9 feet on April 8. All other criteria were met during measured inspections. Tilting weir 340 tripped an alarm and was reset earlier in the day. The tilting weir 337 encoder was replaced on April 9. Both issues may have contributed to the above reading. Tilting weir 337 tripped an alarm and was reset on April 14. The set point

for all tilting weirs was previously adjusted on April 11. The regulating weir set point was adjusted on April 11 and 14.

At the Oregon exit, all criteria were met during measured inspections. The regulating weir tripped an alarm and was reset on April 14. The regulating weir set point was adjusted three times this week.

Oregon exit traveling screen differential monitoring revealed no problems.

Fishway Entrances and Collection Channel: Criteria for all entrances are pool differentials measuring between 1.0 and 2.0 feet, and weir depths measuring 8.0 feet or deeper.

At the Washington ladder, all inspection points were in criteria.

At the Oregon south powerhouse entrance, weir SFEW1 measured 7.8 to 7.9 feet in depth all week. Higher tailwater elevations possibly contributed to these readings.

All other Oregon ladder inspection points were in criteria.

Collection channel surface velocities averaged 1.7 feet per second.

Auxiliary Water Supply System: The Wasco County Public Utility District (PUD) turbine unit in the Washington ladder remains out of service for runner replacement, which has been delayed to an undetermined date. The bypass continues to function satisfactorily.

Two of the three Oregon ladder fish pumps operated satisfactorily with no interruptions in service this week. Both operated with blade angles of 25 degrees. Fish pump 2 is currently under contract for major overhaul with completion scheduled for September 2016.

The juvenile facility continues to supply 450 cubic feet per second (cfs) to the north powerhouse pool.

## Juvenile Fish Passage Facility

The fish passage season consists of alternating days of primary and secondary bypass modes. The switch occurs every morning at 0700 hours. There were no deviations from this schedule. Secondary bypass occurred on April 8, 10, 12 and 14. This week, 205 juvenile lamprey and 21,615 smolts were bypassed.

As reported last week, on April 7, at 0730 hours, after sample inspection had begun, the biologist found one of the two B-side count tunnels partially obstructed. The next sample day, April 8, at 1200 hours, a partial obstruction was removed from one of the two A-side count tunnels. One smolt mortality was recorded. The swing shift technician reported removing debris from the count tunnels later in the day. The specific location was not recorded. No mortalities were

observed. Total descaling was 6.3 percent. The project biologist requested the sample rate be lowered from 20 to 10 percent to reduce the possibly of count tunnel obstructions and descaling.

The top of the return to sample raceway line from the wet lab to the raceway has four unused openings. All line openings are in the wet lab. A steelhead smolt was caught in in an opening on April 9 as one of the covers had failed. This partial obstruction lead to one yearling Chinook smolt coming out of the line and falling to the floor. Both fish were rescued and appeared unharmed. The opening was recovered. Parts have been ordered to completely replace the return line, which will eliminate all four openings.

On April 13, at approximately 0900 hours, when switching from A-side sampling to B-side sampling, the recirculation tank located downstairs in the maintenance room below the wet lab, developed a slow leak in the drain value. This caused the water in the tank to drop below the level required for the chiller pump to circulate water. As a result, the water temperature rose approximately 10 degrees Fahrenheit. The system had been working and the tank river temperature differential was checked prior to the start of sampling. However, the temperature differential was not checked between A-side and B-side sampling. Fish were sent into the lab normally and being "worked up" as usual until the smolt monitoring program lead biologist noticed the water temperature differential and immediately placed fish into cooler water by releasing them to the sample raceway. However, the shock resulted in the loss of 76 juvenile salmonids.

The remainder of the B-side sample was quickly examined outside the building at the B-sample tank anesthetic chambers and bucketed to the sample recovery raceway. No other mortalities occurred.

A new flange was welded onto the chiller tank, the drain valve was replaced and the drain line was refitted with PVC. The chiller was ready by next lab sampling operation, which began April 15 at 0700 hours. In the future, temperature differentials will be checked prior to every dip (sub sample of fish in the sample holding tanks). Also, the use of an alarm system to notify staff when temperature differentials reach a certain point will examined. Finally, the air conditioning in the wet lab will be reinstalled on April 19, which should reduce room air temperature.

The facility passive integrated transponder (PIT) station air conditioning was repaired on April 14.

Forebay Debris/Gatewell Debris/Oil: The forebay debris load remained heavy, consisting mostly of woody material. The quantity of new incoming debris along the powerhouse remained light. Some debris is going over the spillway weirs (TSWs). However, the operators flushed a large number of tumbleweeds through the navigation lock on April 8.

No high trash rack differential measurements were recorded this week.

No problems were observed in the gatewell slots. Woody material was removed from the gatewell slots as ESBSs were installed.

ESBSs/Vertical Barrier Screen (VBSs): ESBSs were installed in units 7 through 14 from April 11 to 13. ESBSs are now deployed in all units. ESBS camera inspections will begin in mid-May. On April 12, following installation, the ESBS in slot 12C tripped multiple alarms. The screen brush cycle was switch from automatic to timer mode, where it remains. The ESBSs in units 9 and 10 were observed with brushes running in automatic mode while the units were out of service on April 13. The normal sequence is "unit off/brushes off" and "units on/brushes automatic cycle". The electricians returned the ESBS brushes to normal operation.

VBS differential monitoring resumed with ESBS installations. No high VBS differentials were recorded and no screens were cleaned. VBS rehabilitations continued.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: Forty two orifices were in use. Orifice valve operator rehabilitations continue. A stick was removed from the orifice in slot 3A on April 11. No harm to fish was noted.

All systems functioned satisfactory in automatic mode.

Bypass Facility: During the bypass season, primary and secondary 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.

The sample gates are turned on and off every other day so that they are in service only during secondary bypass. The gates and all operational systems functioned well. The PIT tag sample gates remained turned off. The facility bypass lines provide a superior route for the fish over the PIT tag sample release lines downstream of the PIT tag sample gates.

Woody material was prevalent throughout the system. Two sticks were removed from the junction of the secondary bypass and sample return to river lines.

## River Conditions

River condition data during the week was provided by the smolt monitoring staff and is outlined in Table 2 below. The data period runs from 0700 to 0700 hours each day. Flows and spill are recorded in one-thousand cubic feet per second. Temperatures are recorded in degrees Fahrenheit.

Spill occurred every day this week with both TSWs in place and operating. Routine spring spill in support of fish passage began on April 10 at 0001 hours. Forty percent of river flow is required to be spilled during the spring season. Since April 10, 40 to 49 percent of flow has been spilled.

Table 2. River Conditions at McNary Dam.

| Daily Average River Flow | | Daily Average Spill | | Water Temperature (Unit 1 scroll case) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 265.3 | 213.1 | 171.2 | 94.7 | 51.7 | 49.1 | 5.5 | 3.0 |

## Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur May 3.

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

Avian Activity: Avian counts, which began on April 1, are recorded in Table 3 below.

Table 3. McNary Project's Daily Avian Count.

| Date | Zone | Gull | Cormorant | Tern | Pelican | Grebe |
|---|---|---|---|---|---|---|
| Apr 8 | Forebay | 0 | 0 | 0 | 0 | 1 |
| | 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 | 3 |
| | Spill | 0 | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 10 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 0 | 0 | 0 | 1 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |
| Apr 11 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 25 | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 1 | 0 |
| Apr 12 | Forebay | 1 | 0 | 0 | 0 | 0 |
| | Spill | 69 | 1 | 0 | 0 | 0 |
| | Powerhouse | 3 | 0 | 0 | 0 | 0 |
| | Outfall | 2 | 1 | 0 | 0 | 0 |
| Apr 13 | Forebay | 4 | 0 | 0 | 0 | 2 |
| | Spill | 92 | 0 | 0 | 0 | 0 |
| | Powerhouse | 5 | 0 | 0 | 0 | 0 |
| | Outfall | 2 | 0 | 0 | 0 | 0 |
| Apr 14 | Forebay | 0 | 0 | 0 | 0 | 0 |
| | Spill | 15 | 0 | 0 | 1 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 | 0 |

Gulls were observed feeding in the spill zone. Birds were occasionally observed in the other zones. Ospreys and loons were noted at times in the forebay zone.

United States Department of Agriculture – Animal and Plant Health Inspection Service – Wildlife Services (USDA–APHIS–WS) personnel began bird hazing on April 3 with one day shift crew member hazing seven days a week.

The bypass outfall sprinklers have been functioning satisfactory. The sprinklers supply pump intake is being cleaned twice a week. However, the pump appears to be losing prime. This issue will be monitored closely.

Research: There is no on site research in progress at this time. Gas bubble trauma (GBT) monitoring began on April 14. The monitoring will occur twice a week during the spill season.

**Project: Ice Harbor**
Biologist: Ken Fone
Dates: April 8 - 14, 2016

## Turbine Operation

Unit 5 was taken out of service on March 14 at 1117 hours, due to an oil leak from the blade packing. The packing is being replaced to fix the leak.

All units are being operated within the 1% peak efficiency range (hard constraint).

## Adult Fish Passage Facilities

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

Fish Ladders: The north fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. The south fish ladder inspection areas (head differentials at fishway exit and picketed leads, and depth over weirs) were in criteria on all inspections. Criteria for head differentials at ladder exits and picketed leads, and depth over the weirs are 0.5 feet or less, 0.3 feet or less, and 1.0-1.3 feet, respectively. The water surface above the fish ladder exits were clear of debris and the bubblers were operating satisfactorily.

Fishway Entrances and Collection Channel: The south shore entrance (SFE-1) depth and channel/tailwater differential were in criteria on all inspections. The north powerhouse entrance (NFE-2) depth and channel/tailwater head differential were in criteria, except for a head differential of 0.7' on April 11. This out of criteria reading was most likely due to fluctuating tailwater from spill making it difficult to get an accurate tailwater reading. The NFE-2 gate elevation readout on the selsyn was calibrated on April 12. The north shore entrance (NSE-1) 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.

The south shore channel velocity was in criteria. The channel velocity criterion is 1.5 - 4.0 feet/second.

Auxiliary Water Supply (AWS) System: Two of the three north shore AWS pumps were operated during the week. Six of the eight south shore AWS pumps were operated throughout the week.

## Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was approximately 1 square yard of debris observed in the forebay. The surface debris coverage in each gatewell slot ranged from 0% to 10%. Oil sheens were observed in gatewell slots 5A and 5C during the week. Oil absorbent pads were in

the slots. The sheens were residual oil from the unit 5 blade packing oil leak. The maintenance bulkhead is installed in gatewell slot 5B and the slot is unwatered to reduce the water leakage into unit 5.

STSs/VBSs: The STS controls were in continuous run mode from April 6 to April 14 due to the presence of Chinook fry and a few yearling Chinook measuring under 120 mm in the fish sample. The STSs were switched back to cycle run mode on April 14. The STS for slot 5B has not yet been installed facilitate the work on unit 5. STS inspections are scheduled for the week of April 18.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe: The juvenile fish bypass is operating with 20 orifices open. The orifices in unit 5 gatewell slots have been closed since the start of the season, because unit 5 has been out of service.

The avian abatement hydrocannon at the end of the outfall pipe has been out of service this season due to a leaking expansion joint in the hydrocannon water line. A replacement expansion joint is being ordered.

Juvenile Fish Facility: The juvenile fish facility is operating in bypass mode except when collecting fish for the sample.

Fish Sampling: Fish sampling occurs twice a week, on Mondays and Thursdays. Sampling results are contained in Table 1.

Table 1. Fish condition sampling results at Ice Harbor Dam (continued on the next page).

April 11:

| Species | Sampled | #Descaled | Morts | Avian Marks |
|---|---|---|---|---|
| C-CH | 55 | 0 | 0 | 0 |
| UC-CH | 44 | 0 | 0 | 0 |
| C-CH-O | 0 | --- | --- | --- |
| UC-CH-O | 0 | --- | --- | --- |
| C-SH | 8 | 0 | 0 | 0 |
| UC-SH | 2 | 0 | 0 | 0 |
| C-COHO | 0 | --- | --- | --- |
| UC-COHO | 0 | --- | --- | --- |
| C-SOCK | 0 | --- | --- | --- |
| UC-SOCK | 0 | --- | --- | --- |
| TOTAL | 109 | 0 | 0 | 0 |

April 14:

| Species | Sampled | #Descaled | Morts | Avian Marks |
|---|---|---|---|---|
| C-CH | 50 | 0 | 0 | 0 |
| UC-CH | 43 | 0 | 0 | 0 |
| C-CH-O | 0 | --- | --- | --- |
| UC-CH-O | 0 | --- | --- | --- |
| C-SH | 23 | 1 | 0 | 0 |
| UC-SH | 7 | 0 | 0 | 0 |
| C-COHO | 0 | --- | --- | --- |
| UC-COHO | 0 | --- | --- | --- |
| C-SOCK | 0 | --- | --- | --- |
| UC-SOCK | 0 | --- | --- | --- |
| TOTAL | 123 | 1 | 0 | 0 |

Removable Spillway Weir: Spill for fish passage began on April 3 at midnight. The RSW is operating normally.

## River Conditions

River conditions during the week are outlined in Table 2.

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 |
| 103.9 | 67.9 | 66.3 | 50.7 | 52.0 | 48.0 | 5.2 | 4.2 |

*Unit 1 scroll case temperature.

## Other

Inline Cooling Water Strainers: Monthly turbine cooling water strainer inspections occurred on March 28 and 29. A total of 23 juvenile lamprey and 1 Siberian prawn (all mortalities) were found. The next inspections are scheduled for the week of April 18.

Invasive Species: No new exotic species have been found.

Avian Activity: The numbers of gulls and cormorants observed around the project (Table 3 below) increased during the week. Beginning April 1, contracted land-based hazing of piscivorous birds occurred for 8 hours per day, changing to 16 hours per day starting on April 10. Boat-based hazing for 8 hours per day, 3 days per week, began on April 10. The hazing was effective at keeping birds out of the zones immediately adjacent to the dam, including the fish bypass outfall pipe.

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

| Date | Gulls | Cormorants | Caspian Terns | Grebes | Pelicans |
|---|---|---|---|---|---|
| April 8 | 7 | 6 | 0 | 2 | 3 |
| April 9 | 0 | 25 | 0 | 0 | 1 |
| April 10 | 0 | 29 | 0 | 0 | 0 |
| April 11 | 11 | 25 | 0 | 0 | 2 |
| April 12 | 3 | 61 | 0 | 0 | 1 |
| April 13 | 44 | 60 | 0 | 0 | 4 |
| April 14 | 19 | 24 | 0 | 0 | 5 |

Research: No on-site research is occurring at this time.

**Project: Lower Monumental**
Biologists: Bill Spurgeon and Raymond Addis
Dates: April 8 - 14, 2016

## Turbine Operation

The units are being operated within the hard constraint 1% peak efficiency criteria. Unit 4 incurred a 1% violation from 0602 to 0618 hours on April 12 because of a GDACS (Generic Data Acquisition and Control System) issue. Unit 1 was removed from service on December 10, 2014 for unit rehabilitation with an estimated return to service date of January 12, 2017.

## Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on April 8, 9, 10, 13 and 14.

Fish Ladders: Fishway exit head differentials and depths over the weirs were within criteria (≤ 0.5' and 1.0'-1.3', respectively) on all inspections. Picketed lead head differentials were in criteria (≤ 0.4' and ≤ 0.3' for north and south shore fishways, respectively) on all inspections.

Fishway Entrances and Collection Channel: NSE1 and NSE2 weir gates were in depth criteria (criteria: ≥ 8' or on sill) on all inspections. North shore channel/tailwater head was in criteria (1'-2') on all inspections.

SPE1 and SPE2 weir gates were in depth or sill criteria (criteria: ≥ 8' or on sill) on all inspections. While on sill, the gate depth readings were 6.6, 6.8 and 7.6 feet respectively. 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 6.8 and 7.2 feet respectively.

SSE2 was in criteria (6' above sill) on all inspections. South shore channel/tailwater head was in criteria (1'-2') on all inspections.

Auxiliary Water Supply System: AWS pumps 2 and 3 were operated throughout this period. Pump 1 was out of service throughout this period and will be out of service throughout this season unless an emergency occurs. This unit has a bushing problem.

## Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: There was an average of 200 square yards of forebay debris observed during this period. No oil was observed in the gatewells.

STSs/VBSs: All STSs are operating in cycle run mode.

Orifices, Collection Channel, Dewatering Structure, Flume: The collection channel was operated with 18 orifices open. Orifice 17 had a debris blockage on April 6. The operator was informed and it was resolved on April 7.

Collection Facility: Twenty-four hour condition sampling took place on April 10 and 13 (every third day). Alternate day condition sampling begins on April 15.

Transport Summary: Collection for transport has not begun.

## River Conditions

Routine Spring spill in support of fish passage was initiated at 0001 hours on April 3. River conditions during the week are outlined in Table 1 below.

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 |
| 101 | 66.7 | 29.1 | 28.0 | 53.1 | 51.0 | 3.8 | 2.5 |

*Scrollcase temperatures.

## Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on April 5. There were no live fish recovered. Mortalities included 51 juvenile lamprey.

Invasive Species: No zebra mussels were observed during monitoring station inspections on April 1.

Avian Activity: Gulls and cormorants were the dominant piscivorous bird species observed during fish ladder inspections this week.

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

**Project: Little Goose**
Biologist: Richard Weis
Dates: April 8 - 14, 2016

## Turbine Operation

All turbine units were available for service this week except for unit 5. Unit 5 was placed out of service to inspect for rotor cracks on April 04 at 0700 hours. Hard constraints 1% peak efficiency criteria are in effect. No violations to report.

## Adult Fish Passage Facility

The new Fishway Control System still does not function properly. The system will be in manual mode until repairs can be made. Adult fishway inspections were performed April 11, 12 and 13.

Fish Ladder: The ladder exit head differentials 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.) and picketed lead differentials ranged between 0.0 and 0.1 feet (criteria $\leq$ 0.3 ft.). 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 1.1 and 1.7 feet (criteria 1.0 to 2.0 ft.). SSE weir depths ranged between 8.0 and 8.6 feet (criteria $\geq$ 8.0 ft). NPE weir depths ranged between 6.2 and 6.7 feet (criteria $\geq$7.0 ft.) and were on sill. NSE weir depths ranged between 5.2 to 5.7 feet (criteria $\geq$ 6.0 ft.) and were on sill. Collection channel surface water velocity measured at the North powerhouse ranged between 2.2 and 2.3 fps (criteria 1.5 to 4.0 fps).

Auxiliary Water Supply System: Fish pump 1 is still waiting to be installed. Presently, fish pumps 2 and 3 are running. Water velocity measurements at the north Powerhouse using the Rickly velocity equipment was not conducted this week.

## Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: The trash/shear boom is currently still on shore. Efforts are underway to have it repaired. Woody debris in the immediate forebay was estimated between 2,400 to 2,600 square feet.

Spillway Weir: Spillbay 1 repairs were completed by cannibalizing parts from spillbay 5 and a special spill pattern was approved. The TSW was closed and the low crest bulkhead was installed on April 11. The TSW returned to operation at 1630 hours.

ESBS/VBS: All ESBS screens are deployed. The fish screen 3c trouble light was found lit on April 03 and again on the April 14. Screen limits were adjusted.

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

Transportation Facility: 18 inch pipe repairs were performed on April 6 and 7. Repairs consisted of replacing a flanged collar that rusted from the interior of the pipe. Inspection of failed collar showed a solid metal collar that was thin only on the bottom of the collar where the failure occurred. The 30 inch pipe and the JFF (Juvenile Fish Facility) was watered up on the following Friday. Sampling started Saturday, April 09 and continues on odd-numbered days.

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 229,420 fish were bypassed for just 5 days of sampling. The descaling and mortality rates were 0.7% and 0.01% respectively. This weekly report period saw 0 adult lamprey removed from sample and released in the tailrace. Collection for fish transport will begin May 1.

## River Conditions

River conditions during the week are outlined in Table 1 below.

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 |
| 101.1 | 67.5 | 69.4 | 46.2 | 52.5 | 50.9 | 5.6 | 3.4 |

*Ladder temperature.

## Other

Inline Cooling Water Strainers: Cooling water strainers on all units were last inspected on April 02. A total of 09 dead juvenile lampreys (Ammocoete) were removed.

Invasive Species: The zebra mussel substrate monitor is scheduled for inspection in late April.

Avian Activity: Bird counting and hazing commenced on April 01. See chart below.

| Date | Time (hours) | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|---|
| April 8 | 0702 | 7 | 14 | 0 | 0 |
| April 9 | 0704 | 27 | 31 | 0 | 0 |
| April 10 | 1415 | 91 | 28 | 0 | 0 |
| April 11 | 1300 | 67 | 12 | 0 | 0 |
| April 12 | 1310 | 75 | 19 | 0 | 0 |
| April 13 | 1220 | 61 | 25 | 0 | 0 |
| April 14 | 1220 | 17 | 0 | 0 | 0 |

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

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

**Project: Lower Granite**
Biologists: Elizabeth Holdren, Robert Horal
Dates: April 8 - 14, 2016

## Turbine Operation

Units are being operated within the hard constraint 1% peak efficiency criteria. Unit 4 was forced out of service from 0336 to 1642 hours on April 11 due to exciter issues. Unit 1 was removed from service at 0915 hours on April 12 for Kaplan blade linkage repair and is expected return to service on February 18, 2017.

## Adult Fish Passage Facility

The automatic fish ladder control system was upgraded during the winter maintenance outage. Ongoing adjustments to the automatic control system are being made to address internal functioning errors in the programs. Feat Engineering and a consultant software engineer from Go-Tek installed a new PLC (Programmable Logic Controller) program and modified the Factory Talk screens and tags in the control room March 29. Problems with the system continue. Entrance gates found out of criteria during ladder inspections due to fish ladder control system problems are manually adjusted to depth or sill criteria and left in hand mode until programmers return to make adjustments. Adult fish facilities were inspected by Corps or Anchor QEA biologists April 8, 9, 10, and 13.

Fish Ladder: Fish ladder exit head differential and depth over the weirs were in criteria (≤0.5' and 1.0-1.3', respectively) on all inspections. Picketed lead head differential was in criteria (≤ 0.3'). An average of about 0.25 square yards of debris was observed near the fish ladder exit.

Fishway Entrances and Collection Channel: SSE1 and SSE2 weir gates were in depth criteria (criteria ≥8' or on sill) on all inspections. SSE1 and SSE2 remain in "HOLD" mode at a depth of 625.6 feet due the control systems inability to accurately measure tailwater creating large gate fluctuations. No adjustment were made this week. South shore channel/tailwater head was in criteria (criteria 1'-2') on all inspections.

NPE1 and NPE2 weir gates were in sill criteria (criteria ≥8' or on sill) on all inspection. While on sill, the gate depths were 5.4', 6.0', 6.1', and 7.2 feet. No adjustments were made this week.

North powerhouse channel/tailwater head differential was in criteria (criteria 1'-2') on all inspections.

NSE1 was in criteria (criteria ≥7' or on sill) on all inspections. NSE1 was put in "HOLD" mode at a depth of 626.4 feet due the control systems inability to accurately measure tailwater creating large gate fluctuations. No adjustments were made this week. NSE2 has been out of service since 2011 and remains set with a chain fall hoist in the closed position to improve channel/tailwater head differentials. North shore channel/tailwater head differential was in criteria (criteria 1'-2') on all inspection except April 13 with a reading of 0.9 feet.

Collection channel average velocity was in criteria (criteria 1.5-4.0 fps) on all inspections.

Auxiliary Water Supply System: The fish ladder is in two pump operation with AWS pumps 2 and 3 in service. Return to service of pump 1 is pending bulkhead installation.

Fish Ladder Temperature Control System: N/A

## Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil: An average of about 16.3 square yards of debris was observed in the forebay this week. A slight oil sheen was detected in gatewell slot 1C at 1300 hours on April 14. Oil absorbent booms were deployed in the gatewell.

ESBSs/VBSs: ESBSs and VBSs are scheduled to be inspected in late April.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe: The collection channel is in operations with no problems reported. Orifices are being cycled every three hours.

Collection Facility: The collection facility is in secondary bypass mode. Condition sampling is taking place daily. Fish were collected April 11, and 12 for NOAA's in river survival study.

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

## River Conditions

Routine Spring spill in support of fish passage continues. River conditions during the week are outlined in Table 1 below.

Table 1: River conditions at Lower Granite Dam.

| Daily Average River Flow (kcfs) | | Daily Average Spill (kcfs) | | Water Temperature* ($F^o$) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 104.0 | 68.6 | 20.5 | 20.3 | 50.5 | 48.5 | 4.9 | 4.0 |

*Cooling water intake temperature.

## Other

Inline Cooling Water Strainers: Unit cooling water strainers were are scheduled for late April.

Invasive Species: The zebra/quagga mussel substrate was inspected April 1. No organisms were found.

Avian Activity: Piscivorous bird counts began March 26 with observations being taken from the top of the navigation lock. Avian hazing started April 1. On April 10th, 14 Pelicans were observed resting on the island 2.5 miles below Lower Granite. Daily piscivorous bird counts are summarized in Table 2 below.

Table 2. Daily piscivorous bird counts at Lower Granite Dam.

| Date | Time (hours) | Gulls | Cormorants | Terns | Pelicans |
|---|---|---|---|---|---|
| April 8 | 1007 | 0 | 0 | 0 | 0 |
| April 9 | 1240 | 3 | 1 | 0 | 0 |
| April10 | 1100 | 1 | 1 | 0 | 0 |
| April 11 | 1215 | 11 | 5 | 0 | 0 |
| April12 | 1330 | 2 | 0 | 0 | 0 |
| April 13 | 1342 | 8 | 0 | 0 | 0 |
| April 14 | 1500 | 10 | 0 | 0 | 0 |

GBT: Gas bubble trauma sampling occurred April 14. No signs of gas bubble trauma were seen.

Adult Fish Trap Operations: The trap is in 24 hour operation Monday-Friday at a 17% sample rate. The sample rate was changed to 27% on April 14 at 1400 hours.

Fish Rescue Operation: A fish rescue took place in the unit 1 scrollcase on April 14. Fish recovered included: 15 clipped juvenile steelhead, 4 unclipped steelhead, and 2 clipped yearling Chinook. Mortalities included: 2 clipped steelhead, 2 clipped yearling Chinook, 1 unclipped yearling Chinook, and 1 decomposed fish that appeared to be an adult steelhead. No incidental species were recovered.

At about 0715 hours April 12 during the Corps' daily juvenile fish facility inspection, a juvenile Chinook was observed impinged in the east/west switch gate that diverts fish to the direct barge load line. The direct load line was inspected and 10 live yearling Chinook and 15 live Chinook fry were immediately released to the river from the flume. Mortalities included 30 juvenile yearling Chinook and 31 Chinook fry on direct barge loading dewatering screen. An additional 21 juvenile Chinook mortalities were counted as the line was flushed to the river. It is unclear how fish were diverted into the direct load line while the facility was in secondary bypass mode. Possibilities include the east/west swing gate position was inadvertently changed to direct load mode for a brief amount of time or fish passed under the east/west switch gate seal. Lower Granite juvenile collection was 178,400 with a mortality rate of 0.005% on April 12.

## Research

Idaho Fish and Game (IDFG) Genetic Stock Identification: This study aims to enumerate and characterize natural production of yearling Chinook and juvenile steelhead above LGR with regards to age composition and genetic stock profiles. IDFG will sample Monday through

Friday through mid-June with a goal of collecting 2,000-5,000 genetic samples from yearling Chinook and juvenile steelhead.

Nez Perce Tribe (NPT)/U. of Idaho (UI)/Columbia River Intertribal Fisheries Commission (CRITFC) – Kelt Study: NPT began steelhead kelt collection March 31. This research project investigates steelhead kelt physiology and endocrinology to evaluate the feasibility and success of rehabilitating strategies. NPT will transport up to 150 kelts to Dworshak National Fish Hatchery as part of this study.

National Marine Fisheries Service (NMFS)-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 2015 in natal streams and are diverted to the Sort-By-Code tanks at LGR.

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