**U.S. ARMY CORPS OF ENGINEERS**
**WALLA WALLA DISTRICT**
**FISH FACILITIES WEEKLY REPORT**
**#01-2020**

**Project: McNary**
Biologist: Bobby Johnson and Denise Griffith
Dates: March 1 to 5, 2020

## Turbine Operation

| Yes | No | Turbine Unit Status | | |
|---|---|---|---|---|
| | X | All 14 turbine units available for service. (See table & comments below for details). | **Hard** | **Soft** |
| | X | Available turbines operated within 1% peak efficiency? Constraint in effect. | | X |

Table 1. McNary Unit Outages (OOS) and Return to Service (RTS).

| | OOS | | RTS | | |
|---|---|---|---|---|---|
| **Unit** | **Date** | **Time** | **Date** | **Time** | **Outage Description** |
| 5 | 5/23/19 | 0943 | 4/7/20 | NA | Turbine blade packing. |

Comments: The soft one percent peak efficiency constraint continued. At times, units can run outside the constraint at BPA's request. The hard constraint will begin April 1. Unit priority resumed March 1.

## Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on March 1 and 3. Adult fish counting will resume April 1, at which time the picketed leads will be lowered. Winter maintenance at the Washington and Oregon ladders occurred in January and February, respectively. Some highlights for the ladders during winter maintenance are below. Both ladder systems were inspected by district engineers for evaluation of future rehabilitation.

At the Oregon ladder, the grating was inspected by a dive contractor. Later, the ladder down to the south pool, the north pool and the powerhouse collection channel to PH diffuser 1 was dewatered. The exit traveling screen area was examined with no issues found. Powerhouse diffuser grating SS and ladder diffuser grating 13 were repaired. A total of three lamprey passage "walkways" were replaced at diffusers 13 and 14. No problems were found with entrance weir SFEW2. It was assumed debris was the reason for the jamming observed last season.

At the Washington ladder, the pool grating was inspected by camera. All other grating was physically examined. Abandoned duplex PIT-tag antennae's were removed at the exit and near diffuser 12. Entrance weir W2 was found to be jammed on an anode, which had dislodged from the weir. A damaged roller and the anode were replaced.

Fish Ladder Exits:

| Yes | No | Location | Criteria | Comments |
|---|---|---|---|---|
| X | | Oregon Exit | Head over weir 1.0' to 1.3' | |
| X | | Oregon Count Station Differential | 0.0' to 0.5' | |
| X | | Washington Exit | Head over weir 1.0' to 1.3' | |
| X | | Washington Count Station Differential | 0.0' to 0.5' | |

Comments: Debris loads were minimal near both exits. Tumbleweeds have been observed on and removed from the Washington ladder trash rack.

At the Oregon exit, one set of travelling screen alarms came in and were reset on March 3. At the Washington exit, one regulating weir alarm came in and was reset on March 3.

Fishway Entrances and Collection Channel:

| Yes | No | Sill | Location | Criteria | Comments |
|---|---|---|---|---|---|
| X | | | North Oregon Entrance Head Differential | 1.0' – 2.0' | |
| | X | | NFEW2 Weir Depth | ≥ 8.0' | 7.9' on March 1. |
| | X | | NFEW3 Weir Depth | ≥ 8.0' | 7.9' on March 1. |
| X | | | South Oregon Entrance Head Differential | 1.0' – 2.0' | |
| X | | | SFEW1 Weir Depth | ≥ 8.0' | |
| X | | | SFEW2 Weir Depth | ≥ 8.0' | |
| X | | | Oregon Collection Channel Velocities | 1.5 to 4.0 fps | Averaged 1.7 fps. |
| X | | | Washington Entrance Head Differential | 1.0' – 2.0' | |
| X | | | WFE2 Weir Depth | ≥ 8.0' | |
| X | | | WFE3 Weir Depth | ≥ 8.0' | |

Comments: For the north powerhouse entrances, the biologist asked for set point adjustments on March 1. At the south powerhouse entrances, it was noted the control system panel view was not functioning properly on March 1. The electrical staff resolved the issue. At the Washington ladder entrances, the biologist found W3 in manual mode and after consulting the control room, returned the weir to automatic mode.

Auxiliary Water Supply System:

| Operating Satisfactory | Standby | Out of Service | Auxiliary Water Supply System (AWS) |
|---|---|---|---|
| Yes | | | WA shore Wasco County PUD Turbine Unit |
| | Yes | | WA shore Wasco PUD Bypass |
| | | Yes | Oregon shore Fish Pump 1, OOS to September 12. |
| Yes | | | Oregon Ladder Fish Pump 2, Blade angle: 23 degrees |
| Yes | | | Oregon Ladder Fish Pump 3, Blade angle: 26 degrees |
| Yes | | | OR North Powerhouse Pool supply from juvenile fishway |

Comments: During the winter outage, the Wasco County PUD resolved the issue with the hydraulic system to conduit 3 isolation/bypass gate. After winter maintenance, the fish pumps returned to service with the Oregon ladder. For early start up, which was requested by the region, the juvenile facility returned to service in primary bypass on February 26.

**Juvenile Fish Passage Facility**

Primary bypass continued until March 1, at 0700 hours, when the first day of secondary bypass for early season index sample collection began. The sampling season consist of alternating days of primary and secondary bypass. The first sample was examined on March 2.

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | NA | Item | Comments |
|---|---|---|---|---|
| X | | | Forebay debris load acceptable? (amount) | Heavy. New debris is minimal. |
| X | | | Trash rack differentials measured this week? | Daily. |
| X | | | Trash rack differentials acceptable | |
| | X | | Any debris seen in gatewells (% coverage) | |
| | X | | Any oil seen in gatewells? | |

Comments: The powerhouse debris gradually built up over the winter season. Debris removal will occur when the spill program begins in April. There was minimal debris at the spillway.

Trash rack cleaning occurred in five slots in January. Two yards of debris was removed. Before ESBS's were installed at units 1, 10, 13 and 14, trash racks were cleaned at these units on February 25. Approximately, 63 yards of debris, mostly tumbleweeds, was removed. During both cleanings, no fish were observed. Differentials were monitored all winter. The next trash rack cleaning is scheduled for late March.

One large piece of wood material was removed from 1C slot this week.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (VBSs):

| Yes | No | NA | Item |
|---|---|---|---|
| | X | | ESBSs deployed in all slots and in service? |
| | X | | ESBSs inspected this week? |
| | | X | ESBSs inspection results acceptable? |
| X | | | VBSs differentials checked this week? |
| X | | | VBSs differentials acceptable? |

Comments: ESBS's were installed in units 1, 10, 13 and 14 for early startup sampling and for the adult steelhead top spillway weir (TSW) passage efficiency study on February 26 and 27. Right after installation, the ESBS brush cycle limits for the screens in 13A and 13B slots had to be reset. The electrical staff again examined these screens on March 2. Also, the control programming for the remaining screens was examined this week. The installation of the remaining ESBS's will begin on April 2. Camera inspections in the four units mentioned above will begin in late March.

VBS differential monitoring began on February 26 for the four units being used for early sampling and the TSW study. No high differentials were measured and no screens were cleaned.

Orifices, Collection Channel, Dewatering Structure, and Bypass Pipe:

| Yes | No | NA | Item | Number of orifices in service |
|---|---|---|---|---|
| X | | | Orifices operating satisfactory? | 42 |
| X | | | Dewaterer and cleaning systems operating satisfactory? | |

Comments: After a standard winter maintenance season, the juvenile collection channel returned to service on February 26. Soon after, the transition screen brush electrical cord carrier and the rectangular screen brush retracting springs were adjusted along with one drain pipe support member being tightened. Also, the brush cycle timer automatically reset.

There have been on other problems. The full flow flume adult flush line valve was repaired over the winter and has been functioning properly.

Bypass Facility:

| Yes | No | NA | Item |
|---|---|---|---|
| X | | | Sample gates on? |
| | | X | PIT-tag sampling system on? |

Comments: During the winter outage, the separator was dismantled, cleaned, new supports welded in place, repainted and reassembled with new floor screens installed. However, the separator bottom is highly pitted and will require resurfacing next winter. Otherwise, the maintenance season was fairly standard.

After the beginning of primary bypass, the facility systems became functional on March 1, at 0700 hours, when the sample gates, which will only be operated on secondary bypass days, were turned on. The PIT-tag system will remain out of service as there are no studies requiring its use.

This week, 748 juvenile lamprey and 24 smolts were bypassed during secondary bypass. No smolts were in the sample collected on March 3. There are no problems to report.

TSW Operations: The TSW was installed in bay 20 during the winter maintenance season. The bay was completely ready for the TSW study, which began on March 1. The TSW will be operated per the study plan.

**River Conditions**

Table 4. River Conditions at McNary Dam.

| **Daily Average River Flow (kcfs)** | | **Daily Average Spill (kcfs)** | | **Water Temperature (°F)** | | **Water Clarity (Secchi disk - feet)** | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 159.5 | 137.5 | 3.1 | 0.0 | 41.3 | 39.8 | 4.6 | 4.1 |

Comments: The above data was supplied by the smolt monitoring staff except water clarity, which comes from the control room. All spill recorded was for the TSW passage study.

**Other**

Inline Cooling Water Strainers: There were zero and six juvenile lamprey mortalities recovered from the strainers in January and February, respectively. Juvenile shad was the only other species observed. Seven live juvenile lamprey and 189 juvenile lamprey mortalities were removed on March 3. No other fish were observed.

Avian Activity: Avian counts will begin on April 1. Blue herons and gulls have been observed around the project in low numbers. Cormorants have been noted roosting on the outfall pipe and/or navigation lock wing wall in fairly high numbers. Feeding activity has been minimal.

Invasive Species: None have been seen during the winter outages. No Siberian prawns were observed in this week's samples. Mussel stations will be examined in late March.

Fish Rescue/Salvage**:** None occurred this week.

Research: The adult steelhead top spillway weir (TSW) passage efficiency study began on March 1.

**Project: Ice Harbor**
Biologist: Ken Fone
Dates: March 1 – March 5, 2020

## Turbine Operation

| Yes | No | Turbine Unit Status | | |
|---|---|---|---|---|
| | X | All 6 turbine units available for service (see table & comments below for details). | Hard | Soft |
| X | | Available turbines operated within 1% peak efficiency? Constraint in effect. | | X |

Ice Harbor Unit Outages (OOS) and Return to Service (RTS)

| | OOS | | RTS | | |
|---|---|---|---|---|---|
| Unit | Date | Time | Date | Time | Outage Description |
| 3 | 5/3/19 | 0641 | --- | --- | Turbine runner replacement and stator rewind |
| 2 | 3/4/20 | 0748 | 3/4/20 | 1645 | Model validation testing |
| 5 | 3/5/20 | 0745 | 3/5/20 | 1650 | Model validation testing |

Comments: Unit 5 was operated out of unit priority order for a total of about 2.5 hours to conduct the model validation testing. See Memorandum for the Record 20 IHR 03 for more information.

## Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on March 3, 4, and 5.

Fish Ladders:

| Yes | No | Location | Criteria | Measurements |
|---|---|---|---|---|
| X | | North Ladder Exit Differential | Head ≤ 0.3’ | |
| X | | North Ladder Picketed Lead Differential | Head ≤ 0.3’ | |
| X | | North Ladder Depth over Weirs | Head over weir 1.0’ to 1.3’ | |
| X | | South Ladder Exit Differential | Head ≤ 0.3’ | |
| X | | South Ladder Picketed Lead Differential | Head ≤ 0.3’ | |
| X | | South Ladder Depth over Weirs | Head over weir 1.0’ to 1.3’ | |

Fishway Entrances and Collection Channel:

| Yes | No | Sill | Location | Criteria | Measurements |
|---|---|---|---|---|---|
| | X | | South Shore Entrance (SFE-1) Weir Depth | ≥ 8.0’ or on sill | 7.9’ |
| X | | | South Shore Channel/Tailwater Differential | 1.0’ – 2.0’ | |
| X | | | South Shore Channel Velocity | 1.5 – 4.0 fps | |
| | X | | North Powerhouse Entrance (NFE-2) Weir Depth | ≥ 8.0’ or on sill | 7.1’ |
| X | | | North Powerhouse Entrance Channel/Tailwater Differential | 1.0’ – 2.0’ | |
| X | | | North Shore Entrance (NEW-1) Weir Depth | ≥ 8.0’ or on sill | |
| X | | | North Shore Channel/Tailwater Differential | 1.0’ – 2.0’ | |

Comments: The south fish ladder upper diffuser grating was replaced with new grating in January during the winter maintenance period. Some of the grating had been in poor condition over the last several years, with pieces of perforated plate covering numerous holes where the metal had rusted through.

During the February winter maintenance period, the north shore entrance NEW-1 weir was replaced with the weir that was in NEW-2. The weir that was in NEW-1 was stuck up in the guide slot for the latter half of last year (see

Memorandum for the Record 19 IHR 15 for more information on the problem). NEW-1 is now operating normally. NEW-2 is closed with bulkheads and the problem weir will have its damaged rollers replaced.

The north fish ladder was not returned to service from annual winter maintenance until March 2 at 1045 hours. The ladder was originally scheduled to return to service on February 27, but was delayed due to dredging occurring in the forebay to replace the anchor cables for the navigation lock upstream floating guide wall. See Memorandum for the Record 20 IHR 02 for more details.

The south shore entrance weir depth was slightly below criteria on the March 3 inspection. The powerhouse operator was informed, but the tailwater elevation was lower immediately following the inspection, with the weir on sill. The north powerhouse entrance weir depth was below criteria on March 5, when NFE-2 was in manual control. This occurred when the automated control system PLC was rebooted to perform maintenance on the system, causing the weir controls to default to manual control. The operator switched NFE-2 back to automatic control.

Auxiliary Water Supply (AWS) System:

| Operating Satisfactory | Standby | Out of Service | Auxiliary Water Supply System (AWS) |
|---|---|---|---|
| 6 pumps | 1 pump | 1 pump | Status of the 8 South Shore AWS Pumps |
| 2 pumps | 1 pump | | Status of the 3 North Shore AWS Pumps |

Comments: South shore AWS pump #1 is out of service because of worn bearings in the motor. Planning is underway to replace the bearings.

On March 4, one of the station service breakers tripped, causing the loss of power to some of the AWS pumps, until the pumps were restarted. As a result, only three of the south shore AWS pumps were operating from 0945 hours to 0950 hours, and none of the north shore AWS pumps were operating from 0945 hours to 1040 hours. During this period, there was practically no attraction flow for fish to the north shore entrance.

## Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | NA | Item | Comments |
|---|---|---|---|---|
| X | | | Forebay debris load acceptable? (amount) | Average of 60 square yards |
| | | X | Gatewell drawdown measured this week? | |
| | | X | Gatewell drawdown acceptable | |
| X | | | Any debris seen in gatewells (% coverage) | STSs blocking view into slots |
| | X | | Any oil seen in gatewells? | |

Comments: None.

STSs/VBSs:

| Yes | No | NA | Item |
|---|---|---|---|
| | X | | STSs deployed in all slots and in service? |
| | | X | STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)? |
| | | X | STSs inspected this week? |
| | | X | STSs inspection results acceptable? |
| | | X | VBSs differentials checked this week? |
| | | X | VBSs differentials acceptable? |

Comments: The STSs are removed for annual maintenance.

Orifices, Collection Channel, Dewatering Structure, and Flume:

| Yes | No | NA | Item | Number open and in service |
|---|---|---|---|---|
| | | X | Orifices operating satisfactory? | 0 |
| | | X | Dewaterer and cleaning systems operating satisfactory? | |

Comments: The juvenile fish channel is unwatered for annual maintenance. Five of the overflow weirs in the juvenile fish channel were replaced with newly fabricated weirs and another fabricated weir that was installed a few years ago was fixed to enable it to move in the guide slot. The remaining four weirs still have operating stem connection brackets that are deteriorating from electrolysis, and will be replaced next winter. Also one of the horizontal linkages that serve to operate the weirs in unison was broken and was replaced.

The leaky coupling on the hydrocannon water line was replaced on March 4.

Juvenile Fish Facility: The fish facility is unwatered for annual maintenance.

Fish Sampling: Sampling begins on April 2.

Removable Spillway Weir (RSW): Voluntary spill for fish passage begins on April 3.

## River Conditions

River conditions at Ice Harbor Dam.

| Daily Average River Flow (kcfs) | | Daily Average Spill (kcfs) | | Water Temperature* (°F) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 37.7 | 23.8 | 0 | 0 | 42 | 41 | 3.0 | 1.2 |

*Unit 1 scroll case temperature.

## Other

Inline Cooling Water Strainers: Unit 1, 2, 4, 5, and 6 turbine cooling water strainer inspections took place on March 5. A total of approximately 2,765 dead juvenile lamprey and 24 live juvenile lamprey were recovered. The live lamprey were found in the strainers in fair to poor condition, and were released into the tailrace.

Avian Activity: There were very few piscivorous birds seen around the project.

Invasive Species: No exotic species that are new to the area have been found.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility will be humanely euthanized by EAS staff, frozen and properly disposed of in a landfill.

Fish Rescue/Salvage: Unwatering activities that involved fish rescue did not occur.

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

**Project: Lower Monumental**
Biologists: Chuck Barnes and Raymond Addis
Dates: March 1 - 5, 2020

## Turbine Operation

| Yes | No | Turbine Unit Status | | |
|---|---|---|---|---|
| | X | All 6 turbine units available for service (see table & comments below for details). | **Hard** | **Soft** |
| X | | Available turbines operated within 1% peak efficiency? Constraint in effect. | | X |

Lower Monumental Unit Outages (OOS) and Return to Service (RTS)

| | OOS | | RTS | | |
|---|---|---|---|---|---|
| **Unit** | **Date** | **Time** | **Date** | **Time** | **Outage Description** |
| Unit 1 | 12/18/2019 | 0830 | 3/12/2020 | ERTS | Warranty Work - Seals |
| Unit 2 | 7/15/2019 | 0720 | 7/17/2020 | ERTS | Annual, Draft Tube Liner |

Comments:

## Adult Fish Passage Facility

The adult fishways were inspected by Corps on March 2, 3 and 4.

Fish Ladder:

| Yes | No | Location | Criteria | Measurements |
|---|---|---|---|---|
| X | | North Ladder Exit Differential | Head ≤ 0.5’ | |
| X | | North Ladder Picketed Lead Differential | Head ≤ 0.4’ | |
| X | | North Ladder Depth over Weirs | Head over weir 1.0’ to 1.3’ | |
| X | | South Ladder Exit Differential | Head ≤ 0.5’ | |
| X | | South Ladder Picketed Lead Differential | Head ≤ 0.3’ | |
| X | | South Ladder Depth over Weirs | Head over weir 1.0’ to 1.3’ | |

Comments: North Ladder Exit Differential was out of criteria on the March 3 inspection with a reading of 0.6 feet. Powerhouse personnel cleaned the ladder exit trash rack by boat on March 4.

Fishway Entrances and Collection Channel:

| Yes | No | Sill | Location | Criteria | Measurements |
|---|---|---|---|---|---|
| X | | | North Shore Entrance (NSE-1) Weir Depth | ≥ 8.0’ or on sill | |
| X | | | North Shore Entrance (NSE-2) Weir Depth | ≥ 8.0’ or on sill | |
| X | | | North Shore Channel/Tailwater Differential | 1.0’–2.0’ | |
| | | X | South Powerhouse Entrance (SPE-1) Weir Depth | ≥ 8.0’ or on sill | |
| | | X | South Powerhouse Entrance (SPE-2) Weir Depth | ≥ 8.0’ or on sill | |
| X | | | South Powerhouse Entrance Channel/Tailwater Differential | 1.0’–2.0’ | |
| X | | X | South Shore Entrance (SSE-1) Weir Depth | ≥ 8.0’ | |
| X | | | South Shore Entrance (SSE-2) Weir Depth | ≥ 6.0’ | |
| | X | | South Shore Channel/Tailwater Differential | 1.0’ – 2.0’ | |

Comments: South Powerhouse Entrance weir (SPE-1) was on sill during all inspections with readings of 6.8, 6.9 and 7.0 feet respectively.
South Powerhouse Entrance weir (SPE-2) was on sill during all inspections with readings of 6.8, 6.9 and 7.0 feet respectively.
South Shore Entrance weir (SSE-1) was on sill during the March 3 inspection with a reading of 7.8 feet.
South Shore Channel/Tailwater Differential was out of criteria on March 2 with a reading of 0.9 feet. Control room was notified and operators corrected the system.

Auxiliary Water Supply System:

| Operating Satisfactory | Standby | Out of Service | Auxiliary Water Supply System (AWS) |
|---|---|---|---|
| Yes | | | AWS Fish Pump 1 |
| Yes | | | AWS Fish Pump 2 |
| Yes | | | AWS Fish Pump 3 |

Comments: Fish pumps returned to service at 1545 hours on February 27 after winter maintenance was completed.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | NA | Item | Comments |
|---|---|---|---|---|
| X | | | Forebay debris load acceptable? (amount) | 0 $yds^2$ |
| | X | | Gatewell drawdown measured this week? | |
| | | X | Gatewell drawdown acceptable | |
| | | X | Any debris seen in gatewells (% coverage) | |
| | | X | Any oil seen in gatewells? | |

STSs/VBSs:

| Yes | No | NA | Item |
|---|---|---|---|
| | X | | STSs deployed in all slots and in service? |
| | | X | STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)? |
| | X | | STSs inspected this week? |
| | | X | STSs inspection results acceptable? |
| | | X | VBSs differentials checked this week? |
| | | X | VBSs differentials acceptable? |

Comments: STS's are not yet deployed for the 2020 season.

Orifices, Collection Channel, Dewatering Structure, and Flume:

| Yes | No | NA | Item | Number open and in service |
|---|---|---|---|---|
| | | X | Orifices operating satisfactory? | 0 |
| | | X | Dewaterer and cleaning systems operating satisfactory? | |

Comments: Orifices are closed and Dewaterer is OOS for winter maintenance.

Collection Facility: Fish collection is scheduled to begin on April 1.

Transport Summary: No transport at this time.

Spillway Weir: RSW scheduled to go into service at 0001 on April 3.

## River Conditions

River conditions at Lower Monumental Dam.

| Daily Average River Flow (kcfs) | | Daily Average Spill (kcfs) | | Water Temperature (°F)* | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 27.6 | 22.2 | 0.0 | 0.0 | 41.0 | 40.0 | 2.1 | 1.8 |

*Scrollcase temperatures.

## Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on March 4. Five live juvenile lamprey were salvaged. Mortalities included 346 juvenile lamprey.

Avian Activity: Highest counts of foraging piscivorous birds in tailrace at Lower Monumental Dam.

| Date | Time | Gulls | Cormorants | Terns | Grebes | Pelicans |
|---|---|---|---|---|---|---|
| March 1-5 | NA | 5 | 0 | 0 | 0 | 0 |

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on March 3.

Fish Rescue/Salvage: No Fish Rescue/Salvage took place during this reporting period.

Research: No research is occurring at this time.

**Project: Little Goose**
Biologists: Scott St. John and Richard Weis
Dates: March 1 – March 5, 2020

## Turbine Operation

| Yes | No | Turbine Unit Status | | |
|---|---|---|---|---|
| | X | All 6 turbine units available for service (see table & comments below for details). | **Hard** | **Soft** |
| X | | Available turbines operated within 1% peak efficiency? Constraint in effect. | | X |

Little Goose Unit Outages (OOS) and Return to Service (RTS)

| | OOS | | RTS | | |
|---|---|---|---|---|---|
| **Unit** | **Date** | **Time** | **Date** | **Time** | **Outage Description** |
| 5 | 04/14/17 | 14:11 | 03/31/2021 | 17:00 | Spider and upper guide bearing repair. |

Comments: None.

## Adult Fish Passage Facility

Little Goose fish facility staff inspected the adult Fishway on March 03, 04 and 05.

Fish Ladder:

| Yes | No | NA | Location | Criteria | Measurements |
|---|---|---|---|---|---|
| X | | | Fish Ladder Exit Differential | Head ≤ 0.5’ | |
| X | | | Fish Ladder Picketed Lead Differential | Head ≤ 0.3’ | |
| X | | | Fish Ladder Depth over Weirs | Head over weir 1.0’ to 1.3’ | |
| | | X | Fish Ladder Cooling Water Pumps in Service | | |
| | | X | Fish Ladder Exit Cooling Water Pumps Operating Satisfactorily | | |

Fishway Entrances and Collection Channel:

| Yes | No | Sill | Location | Criteria | Measurements |
|---|---|---|---|---|---|
| X | | | South Shore Entrance (SSE-1) Weir Depth | ≥ 8.0’ | |
| X | | | South Shore Entrance (SSE-2) Weir Depth | ≥ 8.0’ | |
| X | | | South Shore Channel/Tailwater Differential | 1.0’ – 2.0’ | |
| | | X | North Powerhouse Entrance (NPE-1) Weir Depth | ≥ 7.0’ or on sill | |
| | | X | North Powerhouse Entrance (NPE-2) Weir Depth | ≥ 7.0’ or on sill | |
| X | | | North Powerhouse Entrance Channel/Tailwater Differential | 1.0’–2.0’ | |
| X | | | North Shore Entrance (NSE-1) Weir Depth | ≥ 6.0’ or on sill | |
| X | | | North Shore Entrance (NSE-2) Weir Depth | ≥ 6.0’ or on sill | |
| | X | | North Shore Channel/Tailwater Differential | 1.0’–2.0’ | 0.8, 0.8, 0.8 |
| | X | | Collection Channel Surface Velocity | 1.5 – 4.0 fps | 1.2, 1.4 |

Comments: The adult fishway was returned to service on February 24, with AWS pumps returning to service on February 27. The NSE channel/tailwater differential was found out of criteria on all inspections this report period. The NPE surface velocity was found out of criteria on March 04 and 05. Both criteria mentioned above will likely be fixed once fish pump 1 is returned to service.

Auxiliary Water Supply System:

| Operating Satisfactory | Standby | Out of Service | Auxiliary Water Supply System (AWS) |
|---|---|---|---|
| | | X | AWS Fish Pump 1 |
| X | | | AWS Fish Pump 2 |
| X | | | AWS Fish Pump 3 |

Comments: Fish pumps were returned to service on February 27. Shortly after the pumps were started, maintenance staff noticed that the oiling system in the gearbox of fish pump 1 was not working correctly. Fish pump 1 was taken out of service and is currently being repaired.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | NA | Item | Comment |
|---|---|---|---|---|
| X | | | Forebay debris load acceptable? (amount) | |
| | | X | Gatewell drawdown measured this week? | |
| | | X | Gatewell drawdown acceptable | |
| | | X | Any debris seen in gatewells (% coverage) | |
| | X | | Any oil seen in gatewells? | |

Comments: There is approximately 4,275 square feet of floating woody debris currently inside the trash shear boom in the forebay.

ESBS/VBS:

| Yes | No | NA | Item |
|---|---|---|---|
| | | X | ESBSs deployed in all slots and in service? |
| | | X | ESBSs inspected this week? |
| | | X | ESBSs inspection results acceptable? |
| | | X | VBSs differentials checked this week? |
| | | X | VBSs differentials acceptable? |
| | | X | VBSs inspected this week? |

Comments: ESBS's are scheduled to be installed the week of March 16.

Orifices, Collection Channel, Dewatering Structure, and Flume:

| Yes | No | NA | Item | Number open and in service |
|---|---|---|---|---|
| | | X | Orifices operating satisfactory? | 0 |
| | | X | Dewaterer and cleaning systems operating satisfactory? | |

Comments: The juvenile bypass system is currently dewatered for winter maintenance.

Collection Facility: The juvenile collection facility is currently dewatered for winter maintenance.

Transport Summary: Fish transportation is scheduled to begin in April.

Spillway Weir: Spring spill operations will begin on April 03.

## River Conditions

River conditions at Little Goose Dam.

| Daily Average River Flow (kcfs) | | Daily Average Spill (kcfs) | | Water Temperature* (°F) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 33.1 | 23.7 | 0.0 | 0.0 | 42.6 | 42.0 | 3.9 | 3.2 |

*Ladder temperature.

## Other

Inline Cooling Water Strainers: Inline cooling strainers are being inspected and results submitted every other week.

Avian Activity: Daily piscivorous bird counts at Little Goose Dam will begin on April 01.

Invasive Species: No invasive species have been observed on the mussel station.

Siberian Prawn: Juvenile fish collection begins on April 01. Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by Oregon Department of Fish and Wildlife and Anchor, frozen and properly disposed of in a landfill.

Gas Bubble Trauma (GBT): GBT monitoring is not being conducted at this time.

Fish Rescue/Salvage: None.

Research: None.

**Project: Lower Granite**
Biologists: Elizabeth Holdren and David Miller
Dates: March 1-5, 2020

## Turbine Operation

| Yes | No | Turbine Unit Status | | |
|---|---|---|---|---|
| | X | All 6 turbine units available for service (see table & comments below for details). | **Hard** | **Soft** |
| X | | Available turbines operated within 1% peak efficiency? Constraint in effect. | | X |

Lower Granite Unit Outages (OOS) and Return to Service (RTS)

| | OOS | | RTS | | |
|---|---|---|---|---|---|
| **Unit** | **Date** | **Time** | **Date** | **Time** | **Outage Description** |
| 2 | Nov 4 2019 | | | | Overhaul |

Comments: None.

## Adult Fish Passage Facility

The adult fishway was watered up February 10 with gravity flow. AWS pumps 1 and 2 were returned to at 1530 hours February 11. Lower Granite and Anchor QEA staff inspected the adult fishway on March 1 and 4.

Fish Ladder:

| Yes | No | NA | Location | Criteria | Comments |
|---|---|---|---|---|---|
| X | | | Fish Ladder Exit Differential | Head ≤ 0.5’ | |
| X | | | Fish Ladder Picketed Lead Differential | Head ≤ 0.3’ | |
| X | | | Fish Ladder Depth over Weirs | Head over weir 1.0’ to 1.3’ | |
| | | X | Fish Ladder Cooling Water Pumps in Service | | |
| | | X | Fish Ladder Cooling Water Pumps Operating Satisfactorily | | |

Comments: None.

Fish Ladder Entrances and Collection Channel:

| Yes | No | Sill | Location | Criteria | Comments |
|---|---|---|---|---|---|
| | X | | South Shore Entrance (SSE-1) Weir Depth | ≥ 8.0’ | 7.9 |
| | X | | South Shore Entrance (SSE-2) Weir Depth | ≥ 8.0’ | 7.9 |
| X | | | South Shore Channel/Tailwater Differential | 1.0’ – 2.0’ | |
| X | | | North Powerhouse Entrance (NPE-1) Weir Depth | ≥ 8.0’ or on sill | |
| | X | | North Powerhouse Entrance (NPE-2) Weir Depth | ≥ 8.0’ or on sill | 7.9 |
| X | | | North Powerhouse Entrance Channel/Tailwater Differential | 1.0’–2.0’ | |
| | X | | North Shore Entrance (NSE-1) Weir Depth | ≥ 7.0’ or on sill | 6.4, 6.9 |
| | | | North Shore Entrance (NSE-2) Weir Depth | ≥ 7.0’ or on sill | Closed |
| X | | | North Shore Channel/Tailwater Differential | 1.0’–2.0’ | |
| | X | | Collection Channel Surface Velocity | 1.5 – 4.0 fps | 1.1, 1.0 |

Comments: All depth over weir and collection channel velocity out of criteria readings were likely related to fine tuning of the fish ladder control system. FOGs 1 and 10 are in operation.

Auxiliary Water Supply System:

| Operating Satisfactorily | Standby | Out of Service | Auxiliary Water Supply (AWS) |
|---|---|---|---|
| Yes | | | AWS Fish Pump 1 |
| Yes | | | AWS Fish Pump 2 |
| No | | OOS guide bearing | AWS Fish Pump 3 |

Comments: None.

**Juvenile Fish Passage Facility**

The juvenile bypass system was watered up on February 20 in primary bypass.

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | NA | Item | Comments |
|---|---|---|---|---|
| X | | | Forebay debris load acceptable? (amount) | |
| X | | | Trash rack differentials measured this week? | |
| X | | | Trash rack differentials acceptable | |
| | X | | Any debris seen in gatewells (% coverage) | |
| | X | | Any oil seen in gatewells? | |

Comments: Unit trash racks were raked February 18 and 19.

ESBSs/VBSs:

| Yes | No | NA | Item |
|---|---|---|---|
| X | | | ESBSs deployed in all slots and in service? |
| | X | | ESBSs inspected this week? |
| | | X | ESBSs inspection results acceptable? |
| X | | | VBSs differentials checked this week? |
| X | | | VBSs differentials acceptable? |

Comments: ESBS were installed in units February units 24-27 with the exception of unit 2 that is out of service for blade packing wear ring failure.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

| Yes | No | NA | Item | Number open and in service |
|---|---|---|---|---|
| X | | | Orifices operating satisfactory? | 18 |
| X | | | Dewaterer and cleaning systems operating satisfactory? | |

Comments: None.

Collection Facility: Collection facility was watered up at 0700 hours March 1 with a 20% sample rate in secondary bypass mode. The sample rate was increased to 50% March 2 then 100% March 3. A total of 9 juvenile salmonids were collected March 1-5.

Transport Summary: No transport at this time.

Spillway Weir: The spillway 1 PIT tag detection contract was completed in February. Spring spill and RSW operation will begin at 0001 hours April 3.

## River Conditions

River conditions at Lower Granite Dam.

| Daily Average River Flow (kcfs) | | Daily Average Spill (kcfs) | | Water Temperature* (°F) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 33.0 | 18.3 | 0.0 | 0.0 | 40.5 | 39.5 | 5+ | 5+ |

*Cooling water intake temperature.

## Other

Inline Cooling Water Strainers: Unit cooling strainer inspections were conducted on February 27.

Invasive Species: No zebra/quagga muscles were detected on the trap substrate.

Avian Activity: Biologist daily piscivorous bird counts at Lower Granite Dam.

| Date | Time | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|---|
| March 1 | 1515 | 15 | 3 | 0 | 0 |
| March 2 | 1520 | 0 | 2 | 0 | 0 |
| March 3 | 0720 | 1 | 0 | 0 | 0 |
| March 4 | 1055 | 0 | 1 | 0 | 0 |
| March 5 | 1505 | 1 | 1 | 0 | 0 |

Gas Bubble Trauma (GBT) Monitoring: N/A

Adult Fish Trap Operations: The adult trap was watered up at 1200 hours March 2 started sampling at a 28% (20% /week) sample rate. Collection for sampling will be conducted Monday through Friday until broodstock collection starts August 18.

Fish Rescue/Salvage: N/A

Research:

Idaho Fish and Game (IDFG) Genetic Stock Identification

Fish collected as part of the Lower Granite juvenile condition sample are used to enumerate and characterize age composition and genetic stock profiles of naturally producing yearling chinook and juvenile steelhead. IDFG will sample Monday through Friday through mid-June with a goal of collecting 2,000-5,000 yearling chinook and juvenile steelhead genetic samples.

National Marine Fisheries Service (NMFS) PIT tagging of Adult Wild Chinook and Adult Steelhead for ISEMP-Related Dispersal Monitoring:

The goal of this project is to PIT tag up to 4000 unclipped adult Chinook and 4000 unclipped adult steelhead collected in the adult trap daily sample for dispersal monitoring.

National Marine Fisheries Service (NMFS) Ancillary Adult Passage Monitoring:

Fish that were PIT as juveniles at LWG are monitored as returning adults through the river and LWG facility. For each returning adult the following is estimated; 1) passage time between sets of detection PIT tag coils, 2) whether the fish was handled at the adult trap, 3) duration the fish was held at the adult trap, 4) overall passage time from

ladder entrance to exit, 5) whether the turnpool gate was open or closed during passage. This will be the last year of this evaluation.

Sampling of Steelhead, Chinook salmon, and Sockeye salmon by the Idaho Department of Fish and Game (IDFG) and NOAA Fisheries for Biological data collection.

Upriver migrating steelhead, spring/summer Chinook salmon, and sockeye salmon are collected from the adult trap beginning April 4 through December 15. The goal is to collect 5-20% of adult steelhead, spring/summer Chinook salmon, and sockeye salmon ascending the ladder April 4-December 15. Data collection includes fish scales, genetics tissue, sex and length, wild/hatchery composition, and non-adipose clipped hatchery fish assessment. All natural origin adult steelhead and spring/summer Chinook salmon trapped will be PIT tagged to estimate headwater tributary escapement. Sockeye salmon may be PIT tagged in the future to estimate metrics regarding conversion rates. Some steelhead and spring/summer Chinook salmon may be radio-tagged or spaghetti-tagged. This information on adult fish forms the basis for status information used in several forums including BiOp-RPA identified needs.

PIT Tagging and Genetic Sample Collection from Bull Trout for USFWS:

Bull trout will be collected as part of the normal adult trap daily sample and using the adult SbyC system to recapture previously PIT tagged fish. Untagged bull trout will be PIT tagged, fin clipped for genetic analysis, and have morphometric data collected including weight and length etc. Fin clips will be sent to USFWS to determine the fish's origin. Previously PIT tagged bull trout will only have morphometric data collected. All fish will be released back into the adult fish ladder.