**U.S. ARMY CORPS OF ENGINEERS**
**WALLA WALLA DISTRICT**
**FISH FACILITIES WEEKLY REPORT**
**#42-2017**

**Project: McNary**
Biologist: Bobby Johnson and Denise Griffith
Dates: December 8 – 14, 2017

## Turbine Operation

General Comments: The soft 1% peak efficiency constraint continues.

| Yes | No | Turbine Unit Status |
|---|---|---|
| ☐ | ☒ | All 14 turbine units available for service throughout the week (see Table 1 for outage details below). |

Table 1. Unit Outages at McNary Project.

| Units | Outage Dates | Outage Length | Reason |
|---|---|---|---|
| 3 | Oct 10 to Dec 8 | 60 days | 9-year overhaul. |
| 6 | Dec 9 to 11 | 47 hours | Governor relay issue. |
| 2 | Dec 11 to 16 | 4.7 days | 33 switch, which controls unit shutdown, repaired. |

## Adult Fish Passage Facilities

General Comments: McNary fisheries biologists performed measured inspections of the adult fishways on December 9, 10 and 12. Video review of adult passage will continue to February 28, 2018.

Fish Ladder Exits:

Criteria met?

| Yes | No | Location, Criteria and Measurements |
|---|---|---|
| ☒ | ☐ | Oregon Exit (Criteria – Head over weir 1.0’ to 1.3’) |
| ☒ | ☐ | Oregon Count Station Differential (Criteria – Differential 0.0’ to 0.5’) |
| ☒ | ☐ | Washington Exit (Criteria – Head over weir 1.0’ to 1.3’) |
| ☒ | ☐ | Washington Count Station Differential (Criteria – Differential 0.0’ to 0.5’) |

Comments: The trash racks and picketed leads were cleaned as needed, including Saturdays, at both exits.

Debris loads at the Washington exit and along the shoreline were minimal. However, floating aquatic vegetation was noted in the area. On December 10, the biologist cleaned the picketed leads. On December 11, the lead hoist failed and a temporary hoist was installed. On December 14, the lead hoist was returned to service.

At the Oregon exit and along the shoreline, debris loads were light. Tilting weir 339 remains in manual mode.

Fishway Entrances and Collection Channel:

| Yes | No | Location, Criteria and Measurements |
|---|---|---|
| ☒ | ☐ | North Oregon Entrance Head Differential (Criteria – 1.0’ to 2.0’) |
| ☐ | ☒ | NFEW2 Weir Depth (Criteria – ≥ 8.0’): 7.7’ on December 10. |
| ☒ | ☐ | NFEW3 Weir Depth (Criteria – ≥ 8.0’) |
| ☒ | ☐ | South Oregon Entrance Head Differential (Criteria – 1.0’ to 2.0’) |
| ☒ | ☐ | SFEW1 Weir Depth (Criteria – ≥ 8.0’) |
| ☒ | ☐ | SFEW2 Weir Depth (Criteria – ≥ 8.0’) |
| ☒ | ☐ | Oregon Collection Channel Velocities (Criteria –1.5 to 4.0 fps): Averaged 1.9 fps. |
| ☒ | ☐ | Washington Entrance Head Differential (Criteria – 1.0’ to 2.0’) |
| ☒ | ☐ | WFE2 Weir Depth (Criteria – ≥ 8.0’) |
| ☒ | ☐ | WFE3 Weir Depth (Criteria – ≥ 8.0’) |

Comments: On December 9, the panel views at the Oregon ladder north and south powerhouse entrances would not light up. Readings were verified in the control room. On December 10, the biologist found NFEW2 and SFEW1 both in manual mode. Once the biologist switched NFEW2 to automatic mode, the weir returned to criterion. SFEW1 appeared to be in criterion before being returned to automatic mode. (SFEW1 inspection readings were recorded after the switch.) The electrical staff speculates someone “fat fingered” the panel view and inadvertently had switch both weir to manual mode in the recent past.

Auxiliary Water Supply System:

| Yes | No | In Service? |
|---|---|---|
| ☒ | ☐ | Washington shore Wasco County PUD Turbine Unit. |
| ☐ | ☒ | Washington shore Wasco PUD Bypass. Service was not required. |
| ☒ | ☐ | Oregon Ladder Fish Pump 1: Blade angle was approximately 23 to 25 degrees. |
| ☒ | ☐ | Oregon Ladder Fish Pump 2: Blade angle was approximately 22 degrees. |
| ☒ | ☐ | Oregon Ladder Fish Pump 3: Blade angle was approximately 20 to 22 degrees. |
| ☒ | ☐ | Oregon North Powerhouse Pool supply from juvenile fishway. |

Comments: There are no problems to report. On December 18, the juvenile facility will be switch to emergency bypass. At this time, the juvenile system will no longer be supply axillary water to the Oregon north powerhouse entrance.

**Juvenile Fish Passage Facility**

General Comments: Preparations for winter maintenance continue at the facility and in the collection channel. The system will be switched to emergency bypass on December 18 and the collection channel orifices will be closed on December 20. On December 14, the powerhouse mechanics performed maintenance on the emergency bypass channel release valve to insure it was functional for the fish evacuation on December 20.

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Forebay debris load acceptable? |
| ☒ | ☐ | Trash rack differentials measured? If so, were differentials acceptable? ☒ Yes ☐ No ☐ N/A. |
| ☒ | ☐ | Any debris seen in gatewells? |
| ☐ | ☒ | Any oil seen in gatewells? |

Comments: Forebay debris loads near the powerhouse were moderate to heavy. Debris loads at the spillway were minimal. New incoming debris loads were minimal and consisted of floating aquatic vegetation. No trash racks were cleaned. Trash rack differentials will be measured through the winter season. Woody debris was removed from the gatewell slots as needed this week.

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

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | ESBSs deployed in all slots except at unit 2? ESBS removal will begin next week. |
| ☐ | ☒ | ESBSs inspected this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |
| ☒ | ☐ | VBSs differentials checked this week? If so, were results acceptable? ☒ Yes ☐ No ☐ N/A |

Comments: With the unit not returning to service until December 16 at 0001 hours, the ESBSs in unit 2 were removed on December 12. The brush on the screen in 2A slot was switched to automatic mode on December 10 and continued to be cycled hour by the operators until the screen was raised.

The brush cycles for the screens in slots 1A, 7B, 8C, 12B, units 11 and 14 remained in timer mode. On December 10, the cycle for the brush on the screen in 3B slot was switched from timer to automatic mode. Also, that day, after multiple alarms, the brush cycle for the screen in 9A slot was switched to timer mode. Finally, that day, it was noted that the brush on the ESBS in 13A slot had begun to "short" cycle (not completing a full cycle). The brush cycle was reset nine times this week and switched to timer mode on December 12 after the brush was found "short" cycling at the top of the ESBS.

The station service contractor will begin rewiring of the last ESBS controls, which will be at units 1 to 4, next week.

ESBS camera inspections did not occur as the ESBSs will be raised next week and the screens will be examined then.

VBS differential monitoring will continue until all ESBSs are raised. No high differential measurements were recorded this week. Two screens were cleaned on December 13. No mortalities were observed.

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

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Orifices operating satisfactory? 42 orifices were open. |
| ☒ | ☐ | Dewatering and cleaning systems operating satisfactory? |

Comments: Orifices were adjusted as required for VBS cleaning. On December 10, a debris blockage was removed from the orifice in 3A slot. No harm to fish was noted. Maintenance was performed on orifice operators as required. Moisture in the orifices air supply line was bleed off daily.

We continued to operate the transition screen cleaning brush manually to insure it completes a full cleaning cycle. On December 13, the channel control panel view would not activate when touched. All systems were tested and remained functional. Within a few hours, the electrical staff replaced the panel view light bulb. Also, that day, from 1600 to 1609 hours, a power outage occurred in the channel, which again was related to the station service upgrades. The outage caused no issues.

The juvenile channel rehabilaiton contractor continues preparations for the winter outage season.

Bypass Facility:

| Yes | No | Item |
|---|---|---|
| ☐ | ☒ | Sample gates on? Fall bypass season continues. |
| ☐ | ☒ | Passive integrated transponder (PIT) tag system on? Fall bypass season continues. |

Comments: PIT tag detection continues in the full flow pipe until emergency bypass begins next week. All systems remained out of service as light maintenance and preparations for the winter work list continue.

## River Conditions

General Comments: River conditions were provided by the control room and outlined in Table 2 below. The data period runs from 0000 to 2400 hours each day. Flows and spill are recorded in one-thousand cubic feet per second (kcfs). Temperatures are recorded in degrees F.

Table 2. River Conditions at McNary Dam.

| Daily Average River Flow | | Daily Average Spill | | Water Temperature | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 162.5 | 140.5 | 0.0 | 0.0 | 46.0 | 44.0 | 6.0 | 6.0 |

Comments: There are no problems to report.

## Other

Inline Cooling Water Strainers: During the cooling water strainer examinations on December 12, two juvenile lamprey mortalities were recovered. The only other fish observed were juvenile shad mortalities.

Invasive Species: The mussel station examinations on December 10 revealed no problems.

Avian Activity: Casual avian observations continue while doing other inspections. Overall, gull and cormorant numbers appear to be fluctuating with the juvenile shad outmigration. Both species appear to be reducing in number. The gulls were roosting on project inside and outside of the counting zones in multiple locations. Low numbers of gulls and cormorants were feeding at the bypass outfall. Higher numbers of gulls were also feeding in the powerhouse flow. The gulls and cormorants in the spillway zone are roosting on the navigation lock wing wall and other structures. Total gull numbers appear to be about 100 birds.

In the forebay zone, an occasional gull, gull flock, blue heron, cormorant, loon or grebe was observed. No birds were observed on the rocks by the Washington shore boat dock.

Fish Salvage/Rescue: None occurred.

## Research

Item: No onsite research is occurring at this time.

**Project: Ice Harbor**
Biologist: Ken Fone
Dates: December 8 – December 14, 2017

## Turbine Operation

Yes No Turbine Unit Status
☐ ☒ All 6 turbine units available for service throughout the week (see comments below for outage details).
☐ ☒ Available turbine units operated within 1% peak efficiency constraint. Constraint in effect: ☐ Hard ☒Soft.

Comments: Unit 2 was taken out of service on April 25, 2016, at 0606 hours for the runner replacement. Unit 1 was removed from service at 0741 hours on November 27 for annual maintenance. Unit 3 was noted to be operating a few megawatts below the 1% peak operating efficiency range on the December 11 and 13 fishway inspections. This was due to the GDACS program needing to be updated with the narrower operating efficiency range of unit 3 since it became a fixed-blade unit.

## Adult Fish Passage Facilities

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

Fish Ladders:

| Yes | No | Location, Criteria and Measurements |
|---|---|---|
| ☒ | ☐ | North Fish Ladder Exit Differential (Criteria – Head ≤ 0.5’) |
| ☒ | ☐ | North Fish Ladder Picketed Lead Differential (Criteria – Head ≤ 0.3’) |
| ☒ | ☐ | North Fish Ladder Depth over Weirs (Criteria – Head over weir 1.0’ to 1.3’) |
| ☒ | ☐ | South Fish Ladder Exit Differential (Criteria – Head ≤ 0.5’) |
| ☒ | ☐ | South Fish Ladder Picketed Lead Differential (Criteria – Head ≤ 0.3’) |
| ☒ | ☐ | South Fish Ladder Depth over Weirs (Criteria – Head over weir 1.0’ to 1.3’) |

Comments: The picketed leads are raised out of the water for the remainder of the season.

Fishway Entrances and Collection Channel:

| Yes | No | Sill | Location, Criteria and Measurements |
|---|---|---|---|
| ☒ | ☐ | ☐ | South Shore Entrance (SFE-1) Weir Depth (Criteria: ≥ 8.0’ or on sill) |
| ☒ | ☐ | | South Shore Channel/Tailwater Differential (Criteria: 1.0’ – 2.0’) |
| ☒ | ☐ | | South Shore Channel Velocity (Criteria: 1.5 – 4.0 fps) |
| ☒ | ☐ | ☐ | North Powerhouse Entrance (NFE-2) Weir Depth (Criteria: ≥ 8.0’ or on sill) |
| ☒ | ☐ | | North Powerhouse Channel/Tailwater Differential (Criteria: 1.0’ – 2.0’) |
| ☒ | ☐ | ☐ | North Shore Entrance (NSE-1) Weir Depth (Criteria: ≥ 8.0’ or on sill) |
| ☒ | ☐ | | North Shore Channel/Tailwater Differential (Criteria: 1.0’ – 2.0’) |

Comments: None.

Auxiliary Water Supply (AWS) System:

| Yes | No | In Service and Operating Satisfactory? |
|---|---|---|
| ☒ | ☐ | South Shore AWS Pumps. Six of the eight south shore AWS pumps were in service. |
| ☒ | ☐ | North Shore AWS Pumps. Two of the three north shore AWS pumps were in service. |

Comments: None.

## Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Forebay debris load acceptable? An average of 175 square yards of debris was observed. |
| ☒ | ☐ | Trash rack differentials measured this week? If so, were differentials acceptable? ☒ Yes ☐ No ☐N/A |
| ☒ | ☐ | Any debris seen in gatewells (i.e: over 10% coverage)? Surface coverage ranged from 0% to 20%. |
| ☐ | ☒ | Any oil seen in gatewells? |

Comments: None.

STSs/VBSs:

| Yes | No | Item |
|---|---|---|
| ☐ | ☒ | STSs deployed in all slots and in service? |
| ☐ | ☒ | STSs in continuous-run mode (If not, then STSs are in cycle-run mode)? |
| ☐ | ☒ | STSs inspected this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |
| ☐ | ☒ | VBSs differentials checked this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |

Comments: STSs are in cycle-run mode. Unit 2 STSs are not installed since the unit will not be returned to service this year.

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

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Orifices operating satisfactory? How many are open and in service? 20. |
| ☒ | ☐ | Dewaterer and cleaning systems operating satisfactory? |

Comments: None.

Juvenile Fish Facility: The fish facility is in bypass operation.

Fish Sampling: Sampling is done for the year.

Removable Spillway Weir (RSW): Voluntary spill for fish passage is done for the season.

## River Conditions

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

Table 1. 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 |
| 37.3 | 30.1 | 0 | 0 | 46 | 45 | 9.9 | 9.1 |

*Unit 1 scroll case temperature.

## Other

Inline Cooling Water Strainers: Turbine unit 4 and 6 strainers were cleaned on December 8 because of juvenile shad plugging up the strainers. A total of approximately 500 dead juvenile shad were removed.

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

Avian Activity: There were large numbers of piscivorous birds seen around the project, including gulls, pelicans, mergansers, cormorants, and grebes. Most of them were observed roosting on Eagle Island and/or foraging opportunistically downstream of the powerhouse and at the navigation lock discharge.

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

**Project: Lower Monumental**
Biologists: Chuck Barnes and Raymond Addis
Dates: December 8 – 14, 2017

## Turbine Operation

| Yes | No | Turbine Unit Status |
|---|---|---|
| ☐ | ☒ | All 6 turbine units available for service throughout the week (see comments for outage details). |
| ☒ | ☐ | Available turbine units operated within 1% peak efficiency constraint. |

Constraint in effect: ☐ Hard ☒Soft. Soft constraint began at 0000 hours on November 1.

Comments: Unit 1 was removed from service on 10 December 2014 for Unit rehabilitation with an estimated return to service date of May 31, 2018. Unit 5 was removed from service on January 17, 2017 due to a turbine oil leak with an estimated return to service of January 31, 2018. Unit 3 was removed from service at 0845 on October 20 for a digital governor installation and returned to service at 1315 on December 9, 2017. Unit 4 was removed from service at 1601 on December 6 to investigate blade seal leakage with an estimated return to service date of January 11, 2018. Unit 2 was removed from service at 0700 on December 11 for digital governor installation with an estimated return to service of Jan 26, 2018.

## Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on December 12, 13 and 14.

Fish Ladders:

| Yes | No | Location, Criteria and Measurements |
|---|---|---|
| ☒ | ☐ | North Fish Ladder Exit Differential (Criteria – Head ≤ 0.5’) |
| ☒ | ☐ | North Fish Ladder Picketed Lead Differential (Criteria – Head ≤ 0.4’) |
| ☒ | ☐ | North Fish Ladder Depth over Weirs (Criteria – Head over weir 1.0’ to 1.3’) |
| ☒ | ☐ | South Fish Ladder Exit Differential (Criteria – Head ≤ 0.5’) |
| ☒ | ☐ | South Fish Ladder Picketed Lead Differential (Criteria – Head ≤ 0.3’) |
| ☒ | ☐ | South Fish Ladder Depth over Weirs (Criteria – Head over weir 1.0’ to 1.3’) |

Comments: None.

Fishway Entrances and Collection Channel:

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

Comments: South Powerhouse Entrance weirs (SPE-1 and SPE-2) were on sill during all inspections. While on sill readings for both were 6.9, 6.8 and 7.5 feet. South Shore Entrance (SSE-1) was on sill during the December 13 inspection with a reading of 7.8 feet.

Auxiliary Water Supply System:

| Yes | No | In Service and Operating Satisfactory? |
|---|---|---|
| ☐ | ☒ | AWS Fish Pump 1. |
| ☒ | ☐ | AWS Fish Pump 2. |
| ☒ | ☐ | AWS Fish Pump 3. |

Comments: Pump 1 will be out of service throughout this season unless an emergency occurs.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Forebay debris load acceptable? An average of 350 sq yards of debris observed in forebay. |
| ☒ | ☐ | Trash rack differentials measured this week? If so, were differentials acceptable? ☒ Yes ☐ No ☐ N/A. |
| ☒ | ☐ | Any debris seen in gatewells? |
| ☐ | ☒ | Any oil seen in gatewells? |

Comments: Gatewell debris ranged from 0 to 11% during inspections.

STSs/VBSs:

| Yes | No | Item |
|---|---|---|
| ☐ | ☒ | STSs deployed in all slots and in service? |
| ☐ | ☒ | STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)? |
| ☐ | ☒ | STSs inspected this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |
| ☐ | ☒ | VBSs differentials checked this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |

Comments: STS's in out of service units were removed from their slots on December 12 and 13. Deployed STS's were operating on cycle mode due to CH0 lengths being over the 120 mm criteria point.

Orifices, Collection Channel, Dewatering Structure, and Flume:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Orifices operating satisfactory? How many are open and in service? 18. |
| ☒ | ☐ | Dewaterer and cleaning systems operating satisfactory? |

Comments:

Collection Facility: Collection for transport ended at 0700 on October 1, at which time the facility was placed into primary bypass. The collection facility was dewatered on October 11.

Transport Summary: Transport season ended on October 1.

## River Conditions

General Comments.

Table 1. 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 |
| 35.7 | 31.7 | 0 | 0 | 43.8 | 43.2 | 6.3 | 5.4 |

*Scrollcase temperatures.

Spill: The RSW spill was closed on August 18. Summer spill ended at 0000 on September 1.

## Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on December 12. A total of 2 dead lamprey and 135 dead American shad were removed from the strainers.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on December 4.

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

Table 2. Tailrace counts of foraging piscivorous birds at Lower Monumental Dam.

| Date | Time | Gulls | Cormorants | Terns | Grebes | Pelicans |
|---|---|---|---|---|---|---|
| | | | | | | |

Tailrace counts ended on July 13.

Outfall pipe bird water cannons were shut down and dewatered on October 12.

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

**Project: Little Goose**
Biologists: Scott St. John & Richard Weis
Dates: December 8-14, 2017

## Turbine Operation

Yes No Turbine Unit Status
☐ ☒ All 6 turbine units available for service throughout the week (see Table 1 for outage details).
☒ ☐ Available turbine units operated within 1% peak efficiency constraint. Constraint in effect: ☐ Hard ☒Soft.

Table 1. Little Goose Unit Outages

| Unit | OOS Date | OOS Time | RTS Date | RTS Time | Outage Description |
|---|---|---|---|---|---|
| 1 | 27-Nov | 07:15 | 21-Dec | 17:00 | Unit Annual |
| 5 | 14-Apr | 14:11 | 31-July | 17:00 | Turbine Guide Bearing and Spider Repair (ERTS July 31, 2018) |

Comments: None.

## Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on December 12, 13 and 14.

Fish Ladder:

Yes No Location, Criteria and Measurements
☒ ☐ Fish Ladder Exit Differential (Criteria – Head ≤ 0.5')
☒ ☐ Fish Ladder Picketed Lead Differential (Criteria – Head ≤ 0.3')
☒ ☐ Fish Ladder Depth over Weirs (Criteria – Head over weir 1.0' to 1.3')
☐ ☒ Emergency Ladder Exit Cooling Water Pumps in Service
☐ ☒ Emergency Ladder Exit Cooling Water Pumps Operating Satisfactorily.

Comments: Emergency cooling pump permanent power is scheduled to be installed during the winter maintenance outage.

Fishway Entrances and Collection Channel:

Yes No Sill Location, Criteria and Measurements
☒ ☐ ☐ South Shore Entrance (SSE-1) Weir Depth (Criteria: ≥ 8.0')
☒ ☐ ☐ South Shore Entrance (SSE-2) Weir Depth (Criteria: ≥ 8.0')
☒ ☐ South Shore Channel/Tailwater Differential (Criteria: 1.0' – 2.0')
☐ ☐ ☒ North Powerhouse Entrance (NPE-1) Weir Depth (Criteria: ≥ 7.0' or on sill)
☐ ☐ ☒ North Powerhouse Entrance (NPE-2) Weir Depth (Criteria: ≥ 7.0' or on sill)
☒ ☐ North Powerhouse Entrance Channel/Tailwater Differential (Criteria: 1.0' – 2.0')
☒ ☐ ☐ North Shore Entrance (NSE-1) Weir Depth (Criteria: ≥ 6.0' or on sill)
☒ ☐ ☐ North Shore Entrance (NSE-2) Weir Depth (Criteria: ≥ 6.0' or on sill)
☒ ☐ North Shore Channel/Tailwater Differential (Criteria: 1.0' – 2.0')

☒ ☐ Collection Channel Surface Velocity (Criteria: 1.5 – 4.0 fps)

Comments: Rickly velocity measurement was conducted on November 27 and averaged 3.1 fps.

Auxiliary Water Supply System:

| Yes | No | In Service and Operating Satisfactory? |
|---|---|---|
| ☒ | ☐ | AWS Fish Pump 1 (operating). |
| ☒ | ☐ | AWS Fish Pump 2 (operating). |
| ☒ | ☐ | AWS Fish Pump 3 (operating). |

Comments: None.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Forebay debris load acceptable. |
| ☐ | ☒ | Trash rack differentials measured this week? If so, were differentials acceptable? ☐ Yes ☐ No ☒ N/A. |
| ☐ | ☒ | Any debris seen in gatewells (i.e: over 10% coverage)? |
| ☐ | ☒ | Any oil seen in gatewells? |

Comments: There is an estimated 2,500 square feet of floating woody debris in the immediate forebay. Trash rack differentials were measured on December 7 and were in criteria.

Spillway Weir: Temporary spillway weir was closed for the season on July 19 at 09:00.

ESBS/VBS:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | ESBSs deployed in all slots and in service? |
| ☐ | ☒ | ESBSs inspected this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |
| ☐ | ☒ | VBSs differentials checked this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |

Comments: VBS differentials were measured on December 7 and were in criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Orifices operating satisfactory? How many are open and in service? 19 open. |
| ☒ | ☐ | Dewaterer and cleaning systems operating satisfactory? N/A |

Comment: Orifices and primary dewatering structure are being back flushed every 8 hours.

Collection Facility: Juvenile Fish Facility switched to primary bypass on November 1 at 07:00.

Transport Summary: Collection for transport ended on November 2 with the last truck leaving LGS.

## River Conditions

River conditions during the week are outlined in Table 2 below.

Table 2. 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 |
| 34.6 | 29.2 | 0 | 0 | 42.5 | 42.2 | 6.0 | 6.0 |

*Ladder temperature.

Comment: None.

## Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on December 05.

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

Avian Activity: USDA bird hazing ended on June 25 and USACE bird counts ended on October 31.

Gas Bubble Trauma: Final GBT sampling for the season was conducted on August 21.

Research: No research is currently being conducted at this time.

Siberian Prawn: Collection ended for the season on November 1.

**Project: Lower Granite**
Biologists: Elizabeth Holdren and Stephen Hampton
Dates: December 8-December 14, 2017

## Turbine Operation

| Yes | No | Turbine Unit Status |
|---|---|---|
| ☐ | ☒ | All 6 turbine units available for service throughout the week (see comments below for outage details). |
| ☒ | ☐ | Available turbine units operated within 1% peak efficiency constraint. Constraint in effect: ☐ Hard ☒Soft. |

Comments: Unit 1 remains out of service for blade/runner repair. Unit 2 currently has hydraulically locked blades that limit operation to the upper end of 1% peak efficiency constraint. Unit 3 is operating as the priority unit. Unit 3 out of service 0400-0626 hours December 12 due to unit run relax not picking up in time.

## Adult Fish Passage Facility

General comments: Adult fish facilities were inspected by Corps biologists December 11, 12, 13, and 14.

Fish Ladder:

| Yes | No | Location, Criteria, and Measurements |
|---|---|---|
| ☒ | ☐ | Fish Ladder Exit Differential (Criteria – Head ≤ 0.5’) |
| ☒ | ☐ | Fish Ladder Picketed Lead Differential (Criteria – Head ≤ 0.3’) |
| ☒ | ☐ | Fish Ladder Depth over Weirs (Criteria – Head over weir 1.0’ to 1.3’) |
| ☐ | ☒ | Ladder Temperature Pumps in Service. |
| ☒ | ☐ | Ladder Temperature Pumps Operating Satisfactorily. |

Comments:

Fish Ladder Entrances and Collection Channel:

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

Comments:

NSE-2 has been out of service since 2011 and remains set with a chain fall hoist in the closed position to improve channel/tailwater head differential. NPE-1 and NPE-2 were in sill criteria on all inspections. The fish ladder control system continues to be unable to consistently maintain both depth over the weir and channel/tailwater head differential at the north shore during spill at current tailwater elevation. NSE depth over the weir criteria is being sacrificed to achieve channel/tailwater head differentials.

Collection Channel Velocity: Collection channel velocities were in criteria on all inspections.

Auxiliary Water Supply System:

| Yes | No | In Service and Operating Satisfactory? |
|---|---|---|
| ☒ | ☐ | AWS Fish Pump 1 (operating). |
| ☐ | ☒ | AWS Fish Pump 2 (operating). |
| ☒ | ☐ | AWS Fish Pump 3 (operating). |

Comments: AWS pump 1 and 2 are in operation with pump 1 is in operating in fast operating in fast mode. AWS pump 2 is in standby mode.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Forebay debris load acceptable? Debris was observed in the powerhouse forebay this week. |
| ☐ | ☒ | Trash rack differentials measured this week? If so, were differentials acceptable? ☐ Yes ☐ No ☒ N/A. |
| ☐ | ☒ | Debris in gatewells (i.e.: over 10% coverage)? |
| ☐ | ☒ | Oil in gatewells? |

Comments: Forebay debris in front of the powerhouse averaged about 24.3 square yards of debris this week.

ESBSs/VBSs:

| Yes | No | Item |
|---|---|---|
| ☐ | ☒ | ESBSs deployed in all slots and in service? |
| ☐ | ☒ | ESBSs inspected this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |
| ☐ | ☒ | VBSs differentials checked this week? If so, were results acceptable? ☐ Yes ☐ No ☒ N/A |

Comments: ESBS are dogged off in gatewell slots.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

| Yes | No | Item |
|---|---|---|
| ☐ | ☒ | Orifices operating satisfactory? |
| ☐ | ☒ | Dewaterer and cleaning systems operating satisfactory? |

Comments: Dewatered.

Collection Facility: Dewatered.

Transport Summary: No transport.

## River Conditions

General Comments.

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 |
| 36.6 | 30.0 | 3.4 | 3.3 | 40.7 | 39.9 | 5.0 | 3.8 |

*****Collection channel temperature readings were taken due to unit 1 and 2 temperatures being unavailable during maintenance.

## Other

Adult Fish Trap Operations: Winter maintenance mode.

Inline Cooling Water Strainers: N/A.

Invasive Species: No signs of mussels were present during the December 11 inspection.

Avian Activity: N/A

Spill: Spill is being managed based on river flow. Spill bays 2 and 7 are operating at about 3.5 kcfs each from 0600-1800 hours. This operation will continue through December 15.

Gas Bubble Trauma (GBT) Monitoring: N/A.

Research: N/A.