**U.S. ARMY CORPS OF ENGINEERS**
**WALLA WALLA DISTRICT**
**FISH FACILITIES WEEKLY REPORT**
**#16-2017**

**Project: McNary**
Biologist: Bobby Johnson and Denise Griffith
Dates: June 9 – 15, 2017

## Turbine Operation

General Comments: The hard 1% peak efficiency constraint continues. Unit priority is 1, then 14 to 2 in descending order. On June 10, we requested the unit priority to be changed to 1, 2 then 14 to 3 in descending order. During the startup sequence, we noticed unit 2 with a higher thrust bearing oil pressures than normal. The change in unit priority would reduce the number of unit 2 restarts and the possibly of thrust bearing failure.

| Yes | No | Turbine Unit Status |
|---|---|---|
| ☐ | ☒ | All 14 turbine units available for service throughout the week (see Table 1 for outage details below). |
| ☒ | ☐ | All turbine units operated within 1% peak efficiency constraint. Constraint in effect: ☒ Hard ☐Soft. |

Table 1. Unit Outages at McNary Project.

| Units | Outage Dates | Outage Length | Reason |
|---|---|---|---|
| 5 & 6 | June 15 to 29 | Two weeks | Station service upgrades. |

## Adult Fish Passage Facilities

General Comments: McNary fisheries biologists performed measured inspections of the adult fishways on June 9, 11 and 14. Visual fish counts continue. Issues with the adult ladder temperature data collection shuttle were resolved this week. Starting June 14, data collection switched from bi-weekly to weekly.

The fisheries staff insured the adult lamprey passage structure at Oregon ladder entrance SFEW2 was open on June 12. Video review of night time lamprey passage began on June 15.

Fish Ladder Exits:

| 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: Debris loads at the Washington exit and along the north shoreline were light to minimal. The trash rack and picketed leads were cleaned as needed, including weekends. No solution has been found for the count station passive integrated transponder (PIT) system interference.

At the Oregon exit and along the south shoreline, debris loads were very light to minimal. The regulating weir set point was adjusted on June 14.

Fishway Entrances and Collection Channel:

Criteria Met?

| Yes | No | Location, Criteria and Measurements |
|---|---|---|
| ☒ | ☐ | North Oregon Entrance Head Differential (Criteria – 1.0' to 2.0') |
| ☐ | ☒ | NFEW2 Weir Depth (Criteria – ≥ 8.0'): 7.9' on June 9 and 14. |
| ☐ | ☒ | NFEW3 Weir Depth (Criteria – ≥ 8.0'): 7.9' on June 9. |
| ☐ | ☒ | South Oregon Entrance Head Differential (Criteria – 1.0' to 2.0'): 0.9' on June 14. |
| ☒ | ☐ | 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: The Oregon ladder measured out of criteria points on June 9 and 14 were possibly due to one of eight discharge logs having been removed from fish pump 2, high tailwater elevations creating unfavorable hydraulic gradients and slack forming in the cables of entrance weirs NFEW2 and NFEW3. Due to this cable slack, NEFW2 might have been slightly more out of criteria (shallower) than measured on June 9 and 14 by approximately one to two tenths.

With possibly 0.5 feet of cable slack at times, NFEW3 was probably out of criteria on June 7, 11 and 14 even with measured depths of 8.0, 8.2 and 8.0 feet, respectively. NFEW3 might have been more out of criteria (shallower) than measured on June 9. The weir appeared out of criteria on June 13 during a visual inspection. The fisheries staff and operators monitored NFEW3 throughout the week. The operators and general maintenance staff made adjustments to the weir as needed to remove the cable slack. We will continue to monitor the weir.

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 28 to 30 degrees. |
| ☐ | ☒ | Oregon Ladder Fish Pump 2: Testing occurred on June 12. Further testing has been delayed. |
| ☒ | ☐ | Oregon Ladder Fish Pump 3: Blade angle was 30 to 32 degrees. |
| ☒ | ☐ | Oregon North Powerhouse Pool supply from juvenile fishway. |

Comments: Fish pump 2 testing has been delayed due to mechanical and electrical issues. Missing packing, oil system filters and relays were replaced. The blade governor is the main issue, which still requires resolution. The seven remaining discharge logs have not yet been scheduled for removal.

**Juvenile Fish Passage Facility**

General Comments: The fish passage season consists of alternating days of primary and secondary bypass modes, with the switch occurring at 0700 hours each morning. No schedule deviations occurred. This week, 1,300 juvenile lamprey and 81,206 smolts were bypassed.

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 and spillway were minimal. New debris is coming in along north shoreline and would be described as light. Operators continue to flush debris down the navigation lock as needed. No trash racks were cleaned.

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

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | ESBSs deployed in all slots? |
| ☐ | ☒ | 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: The brush cycles for the screens in 1A, 3B, 7B, 12B, 14A slots and in unit 11 remained in timer mode. ESBS camera inspections did not occur this week. During the station service upgrades, all ESBS wiring at units 5 and 6 will be replaced.

VBS differential monitoring continued. No problems were found and no screens were cleaned.

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

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

Comments: One of four guide wheels was found out of position on the rectangular screen cleaning brush on June 11. The brush continued to operate satisfactorily. The debris jams reported in Weekly #14 on May 27 and 31 could have possibly been related to this guide wheel instead of debris. The brush was out of service for repairs and lubrication from 0800 to 1300 hours on June 13. The fisheries staff ran the air burst system more frequently during the outage.

We continued to operate the transition screen cleaning brush manually to insure it completes a full cleaning cycle. No issues have occurred recently. A new solenoid was ordered but has not yet arrived.

Scheduled maintenance was performed on the two side dewatering valves on June 13.

Additional paint has been removed from the last 200 yards of the bypass pipe during the high flows this season.

Bypass Facility:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Sample gates on? Yes, during secondary bypass only. |
| ☐ | ☒ | PIT tag system on? The system remains off unless a study is occurring. 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. |

Comments: 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.

Algae removal from the flumes and tanks continued.

On June 11, a clipped subyearling Chinook mortality was found upstream of the return to sample raceway trough water supply line in the wet lab. The next day, spray foam was used to seal the trough around the supply line and block fish from entering the area in the future.

The facility PIT tag room air conditioning failed on June 13. The system was repaired the next day.

## River Conditions

General Comments: River conditions were provided by the biological services contractor, Anchor QEA and are outlined in Table 2 below. Water clarity was provided by the McNary control room. The data period runs from 0700 to 0700 hours each day.

Table 2. 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 |
| 440.7 | 385.1 | 273.3 | 214.9 | 58.4 | 57.2 | 2.5 | 2.0 |

Comments: Spill in excess of powerhouse capacity occurred all week. Routine spill in support of fish passage continues. In the spring, which concluded June 15, 40 percent of river flow is the spill target. On June 16, summer spill will begin with 50 percent of river flow is the spill target. This week, 56 to 62 percent of flow was spilled.

The Fish Passage Operations & Maintenance Coordination Team (FPOM) had moved the TSW removal start date from June 8 to 12 due to high rivers flows. During the FPOM meeting on June 8, the region agreed to change removal start date to June 26 due to heavy debris loads in the river. The control room received teletype regarding this request on June 9.

Anchor QEA has all temperature probes deployed except at the bypass outfall due to high river flows. On June 12, the data probe at unit 5 forebay was replaced. Daily data reports began on June 15. Weekly data will be reported separately from the smolt monitoring report. Anchor QEA is fully staffed for the temperature monitoring season.

## Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur in late June or early July.

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

Avian Activity: Avian counts continued and tailwater numbers are recorded in Table 3 below. Observations were made every morning. Overall, bird numbers appear greatly reduced so far this season except for grebes. However, tern and pelican numbers increased during this reporting period. In the spill zone, the pelicans were along the navigation lock wing wall or at the mouth of the lock. The terns were feeding in the flow from the spillway. In the powerhouse zone, the birds were feeding along the Oregon shoreline below the separator observation building.

In the forebay zone, 15 to 36 grebes were observed along with an occasional osprey, cormorant, blue heron and tern. The grebes appear to be in two groups with the second group outside the zone at times. Fair numbers of pelicans along with a few terns and cormorants were observed on the rocks by the Washington shore boat dock.

No grebes entered the gatewell slots or juvenile collection channel this week.

United States Department of Agriculture – Animal and Plant Health Inspection Service – Wildlife Services (USDA–APHIS–WS) personnel continued working two shifts seven days a week and hazing from a boat three days a week. Due to low bird numbers in the tailwater area, the boat crew continues to assist with hazing grebes from the forebay

deck. Wave action at the bypass outfall has not allowed for hazing from the outfall walkway, which has not been needed due to low bird numbers.

On June 12, the hazing water sprinkler pump was examined and found to have an oil leak. All oil was contained. A new pump seal was ordered and the seal was replaced. The pump returned to service at approximately 1645 hours on June 13. However, the sprinkler appeared to again have insufficient pressure on June 14. The pump intake was cleaned but no flow improvement was noted. The sprinkler heads will be examined as soon as river flows allow.

Table 3. McNary Project's Daily Avian Count.

| Date | Zone | Gull | Cormorant | Tern | Pelican |
|---|---|---|---|---|---|
| June 9 | Spill | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 1 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 10 | Spill | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 1 | 0 | 1 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 11 | Spill | 0 | 0 | 0 | 2 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 2 | 0 | 0 |
| June 12 | Spill | 0 | 1 | 0 | 4 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 13 | Spill | 0 | 0 | 0 | 8 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 14 | Spill | 0 | 0 | 0 | 25 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 15 | Spill | 1 | 0 | 14 | 15 |
| | Powerhouse | 0 | 1 | 0 | 2 |
| | Outfall | 1 | 0 | 1 | 0 |

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

## Research

Item: No onsite research is occurring at this time. Gas bubble trauma (GBT) monitoring continues and will occur twice a week during the spill season. There were no fish exhibiting signs of GBT during this reporting period.

**Project: Ice Harbor**
Biologist: Ken Fone
Dates: June 9 – June 15, 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 4 was removed from service at 1218 hours on March 6, 2017, when it tripped off due to a problem in the 115 kv section 2 bus. That problem was fixed, but personnel are also investigating the source of a possible oil leak from unit 4. Unit 3 was noted to be operating a little above the 1% peak operating efficiency range during the June 14 fishway inspection, 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 June 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 ≤ 0.3’) |
| ☒ | ☐ | 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 water surface above the fish ladder exits was clear of debris. The bubblers were operating satisfactorily.

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 Entrance 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: On the June 13 inspection, the SFE-1 and NSE-1 weir gate depths were out of criteria at 7.0’. The gates are in manual control, and were lowered to bring the depths into criteria.

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: The intake trash rack for north shore AWS pump 3 was cleaned on June 14, in response to debris clogging the pump and causing it to trip off on June 6 (documented in MFR 17 IHR 08).

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

| Yes | No | Item |
|---|---|---|
| ☐ | ☒ | Forebay debris load acceptable? An average of 750 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 25%. |
| ☐ | ☒ | Any oil seen in gatewells? |

Comments: On June 15, an emergency debris spill occurred from 1010 hours to 1145 hours to clear approximately 800 square yards of woody debris that had accumulated behind spill gates 3, 4, and 5 (see MFR 17 IHR 09 for details).

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: Unit 2 STSs are not installed since the unit will not be returned to service this year. STSs have been in continuous run mode since April 4 due to the presence of subyearling Chinook and\or sockeye with average fork lengths of less than 120 mm in the Lower Monumental and/or Ice Harbor juvenile fish samples.

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 operated in bypass, except when fish sampling operations are occurring.

Fish Sampling: Sampling operations occur on Monday and Thursday each week. See Table 1 below for a summary of the sampling results.

Removable Spillway Weir (RSW): Voluntary spill for fish passage is occurring, including spill through the RSW.

Table 1. Fish condition sampling results at Ice Harbor Dam.

June 12:

| Species | Sampled | #Descaled | Morts | Avian Marks |
|---|---|---|---|---|
| C-CH | 0 | --- | --- | --- |
| UC-CH | 0 | --- | --- | --- |
| C-CH-O | 67 | 0 | 0 | 0 |
| UC-CH-O | 55 | 0 | 0 | 0 |
| C-SH | 1 | 0 | 0 | 0 |
| UC-SH | 2 | 0 | 0 | 0 |
| C-SOCK | 0 | --- | --- | --- |
| UC-SOCK | 0 | --- | --- | --- |
| C-COHO | 0 | --- | --- | --- |
| UC-COHO | 0 | --- | --- | --- |
| TOTAL | 125 | 0 | 0 | 0 |

June 15:

| Species | Sampled | #Descaled | Morts | Avian Marks |
|---|---|---|---|---|
| C-CH | 0 | --- | --- | --- |
| UC-CH | 0 | --- | --- | --- |
| C-CH-O | 45 | 1 | 0 | 1 |
| UC-CH-O | 34 | 0 | 0 | 1 |
| C-SH | 0 | --- | --- | --- |
| UC-SH | 1 | 0 | 0 | 0 |
| C-SOCK | 0 | --- | --- | --- |
| UC-SOCK | 0 | --- | --- | --- |
| C-COHO | 0 | --- | --- | --- |
| UC-COHO | 0 | --- | --- | --- |
| TOTAL | 80 | 1 | 0 | 2 |

**River Conditions**

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

Table 2. River conditions at Ice Harbor Dam.

| Daily Average River Flow (kcfs) | | Daily Average Spill (kcfs) | | Water Temperature* (°F) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 153.8 | 110.0 | 100.8 | 73.2 | 58 | 58 | 2.3 | 2.0 |

*Unit 1 scroll case temperature.

**Other**

Inline Cooling Water Strainers: Turbine cooling water strainer were not inspected during this reporting period.

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

Avian Activity: There were moderate to low numbers of piscivorous birds counted around the project (Table 3 below). Gull and cormorant numbers remained low this week. Most of the pelicans were observed foraging around Eagle Island. Contracted land-based hazing of piscivorous birds (but not pelicans) is occurring for 16 hours per day. Boat-based hazing for 8 hours per day, three days per week is occurring. One or two cormorants below the juvenile fish outfall pipe have been somewhat difficult to effectively haze.

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

| Date | Gulls | Cormorants | Caspian Terns | Grebes | Pelicans |
|---|---|---|---|---|---|
| June 9 | 0 | 5 | 0 | 0 | 34 |
| June 10 | 0 | 2 | 0 | 0 | 27 |
| June 11 | 0 | 3 | 0 | 0 | 26 |
| June 12 | 0 | 1 | 0 | 0 | 19 |
| June 13 | 0 | 1 | 0 | 0 | 12 |
| June 14 | 0 | 1 | 0 | 0 | 5 |
| June 15 | 1 | 2 | 0 | 0 | 20 |

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

**Project: Lower Monumental**
Biologists: Chuck Barnes and Raymond Addis
Dates: June 9 - 15, 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. Hard constraint began at 0000 hour on April 1.

Comments: Unit 1 was removed from service on December 10, 2014 for Unit Rehabilitation with an estimated return to service date of February 28, 2018. Unit 5 was removed from service on January 17, 2017 due to a turbine oil leak with an estimated return to service of March 31, 2018. Unit 6 was removed from service at 1128 on June 6 and returned to service at 1515 on June 13 due to an oil leak.

## Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on June 9, 10, 11 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: North Shore Entrance (NSE-1) weir depth reading was out of criteria on the June 9 inspection with a reading of 7.7 feet. North Shore Channel/Tailwater differential was out of criteria on the June 10 inspection with a reading of 0.9 feet. South Shore Channel/Tailwater differential was out of criteria during all inspections with

readings of 0.3, 0.3, 0.6 and 0.6 feet respectively. The out of criteria readings were due to the automated system not working well with the high tailwater levels and high spill levels.

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 360 square 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: An Emergency spill occurred from 1052 to 1155 on June 13 to remove a large mass of woody debris from the forebay. Details of the spill can be found in the FPOM document, 17 LMN 06 MFR. Gatewell woody debris was removed on June 11 and 15.

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)? STS's were placed in continuous-run mode on March 30 due to heavy debris loads. |
| ☐ | ☒ | 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: None.

Orifices, Collection Channel, Dewatering Structure, and Flume:

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

Comments: Due to high debris in the forebay, the orifices were checked every two hours during this reporting period. Orifice 9 was observed with an erratic flow on June 10. Orifice 15 was observed with low flow on June 14. Powerhouse operators were informed and cleared all blockages.

Collection Facility: Collection into raceways for transport began at 0700 on May 1.

Transport Summary: Every-day barging changed to alternate day barging on May 26. A total of 59,450 fish were collected, of which 72,502 were transported during this reporting period. Due to every other day barge transportation, the numbers transported included 13,100 fish collected during the previous reporting period on June 8.

## 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 |
| 151.2 | 110.2 | 92.4 | 48.0 | 59.0 | 58.2 | 1.5 | 1.2 |

*Scrollcase temperatures.

## Other

Inline Cooling Water Strainers: Cooling water strainers were not inspected during this reporting period.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on June 2.

Avian Activity: Cormorants, gulls and pelicans 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 |
|---|---|---|---|---|---|---|
| 6/9/2017 | 1130 | 0 | 0 | 0 | 0 | 1 |
| 6/10/2017 | 1210 | 0 | 0 | 0 | 0 | 0 |
| 6/11/2017 | 1230 | 0 | 0 | 0 | 0 | 0 |
| 6/12/2017 | 1330 | 0 | 0 | 0 | 0 | 0 |
| 6/13/2017 | 1300 | 0 | 0 | 0 | 0 | 0 |
| 6/14/2017 | 1230 | 0 | 0 | 0 | 0 | 0 |
| 6/15/2017 | 1300 | 0 | 0 | 0 | 0 | 0 |

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

**Project: Little Goose**
Biologists: Scott St. John & Richard Weis
Dates: June 09 – June 15, 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: All turbine units were available for service throughout this report period, except units 2, 3 and 5. Units 2 and 3 were out of service (OOS) for trash rack raking on June 13. Unit 5 remains OOS due to excessive vibration. Hard constraints of 1% peak efficiency criteria took effect on April 01.

## Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists and Anchor QEA staff on June 11 and 15.

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: No comments.

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: None.

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 35,000 square feet of floating woody debris currently in the forebay. Trash raking was completed on June 13 for units 2 and 3. Trash raking is scheduled again for June 19. Trash rack differential was measured June 15. All trash rack differential measurements were within criteria.

Spillway Weir: The Spillway Weir was opened in the low crest position on March 22.

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 differential measurements were conducted on June 15 and were within criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume:

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

Comment: Due to the large amounts of debris in the forebay, orifices have been backflushed and/or rotated every two hours, 24 hours a day. The dewatering structure is being cleaned every two hours during daytime operating hours.

Collection Facility: Juvenile Fish Facility is currently operating.

Transport Summary: The collection and transportation facility operated within criteria this reporting period. A total of 90,238 fish were collected and 115,219 were transported during this reporting period. Due to every other day barge transportation, the numbers transported included 25,426 fish collected during ther previous reporting period on June 8. The descaling and mortality rates were 0.4% and 0.4% respectively.

## 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* (°F) | | Water Clarity (Secchi disk - feet) | |
|---|---|---|---|---|---|---|---|
| High | Low | High | Low | High | Low | High | Low |
| 150.4 | 111.7 | 64.7 | 38.6 | 58.9 | 57.9 | 1.6 | 1.5 |

*Ladder temperature.

Comment: None.

## Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on June 11. No fish mortalities were documented.

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

Avian Activity: USDA bird hazing began on April 03. See table below for USACE counts.

Table 2. Daily Piscivorous bird counts at Little Goose Dam.

| Date | Time | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|---|
| 06-09 | 13:30 | 1 | 0 | 0 | 0 |
| 06-10 | 11:00 | 1 | 1 | 0 | 0 |
| 06-11 | 09:00 | 0 | 0 | 0 | 0 |
| 06-12 | 07:45 | 0 | 0 | 0 | 0 |
| 06-13 | 12:30 | 0 | 0 | 0 | 0 |
| 06-14 | 12:30 | 0 | 0 | 0 | 0 |
| 06-15 | 12:45 | 0 | 1 | 0 | 0 |

Gas Bubble Trauma: GBT sampling was conducted on June 05. There were 100 fish examined, 5 of which showed signs of GBT.

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

**Project: Lower Granite**
Biologists: Elizabeth Holdren
Dates: June 9-15, 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 with an expected return to service date of August 18. Unit 2 was out of service from 2303-2333 hours June 6 due to governor pressure device failure resulting in full load rejection.

## Adult Fish Passage Facility

General comments: Adult fish facilities were inspected by Corps or Anchor QEA biologists June 9, 10, 11, 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 Temperature Control System: The fish ladder temperature control system auxiliary pumps are in standby mode.

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: 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 differential. NPE1 and NPE 2 remain out of service in the sill position until in water

work repairs are coordinated. Cotter pins on all gates are scheduled to be replaced during the 2017-2018 winter adult fishway outage.

Collection Channel Velocity: Channel velocity was in criteria this week.

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 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 188.8 square yards 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: None

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

| Yes | No | Item |
|---|---|---|
| ☐ | ☒ | Orifices operating satisfactory? There are 18 orifices operating. |
| ☐ | ☒ | Dewaterer and cleaning systems operating satisfactory? |

Comments: Orifices continue to be checked and back flushed for debris every one to three hours depending on debris load.

Collection Facility: The facility is in collection for transport mode. Fish are collected in the east raceways Sunday-Thursday for NOAA research and transported the following day.

Transport Summary: Every other day transport is occurring with barges departing on odd numbered days.

## River Conditions

General Comments.

Table 1: 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 |
| 155.1 | 116.4 | 65.0 | 37.5 | 58.0 | 55.0 | 1.6 | 1.0 |

*Cooling water intake temperature.

## Other

Inline Cooling Water Strainers: N/A

Invasive Species: The Zebra mussel trap was inspected June 5. No signs of mussels were present.

Avian Activity: Daily hazing of piscivorous birds is occurring.

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

| Date | Time (hours) | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|---|
| June 9 | 16:22 | 0 | 0 | 0 | 62 |
| June 10 | 14:45 | 0 | 0 | 0 | 8 |
| June 11 | 12:45 | 0 | 0 | 0 | 5 |
| June 12 | 15:30 | 0 | 0 | 0 | 25 |
| June 13 | 15:00 | 1 | 0 | 0 | 32 |
| June 14 | 11:15 | 2 | 0 | 0 | 21 |
| June 15 | 10:25 | 0 | 0 | 0 | 3 |

Spill: Debris in the forebay continues to accumulate in front of the spillway and powerhouse. Large logs wedged between the RSW and debris boom resulting in mats of debris have been a reoccurring problem this year. On June 14 a mat of debris behind a wedged log covered about 1/3 of the area in front of the RSW restricting surface flow. From 1045-1208 hours June 14 the Project closed the RSW and opened spillway 3 to remove the wedged log and debris. The Project will continue to implement emergency debris spills when debris accumulates in front of the RSW as described in FPP (LWG-31 5.2. Emergency Debris Spills) to prevent obstructions to fish passage.

Gas Buble Trauma (GBT): Fish are being sampled from the separator for GBT Thursdays. No signs of GBT were seen in the 100 fish examined this week.

## Research

Idaho Fish and Game (IDFG) Genetic Stock Identification
IDFG continue working up fish collected as part of Lower Granite condition sample. This study aims to enumerate and characterize natural production of yearling Chinook and juvenile steelhead above Lower Granite Dam (LWG) 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

Collection of steelhead from Lower Granite juvenile separator for NPT began March 26 with the first sample being worked up March 27. This research project investigates steelhead kelt physiology and endocrinology to evaluate the feasibility and success of rehabilitating strategies. Selected kelts collected at Granite are transported to Nez Perce Tribal Hatchery for reconditioning 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 goals are to characterize migration timing and estimate parr-to-smolt survival to LWG 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 2016 in natal streams and are diverted to the Sort-By-Code tanks at LWG.

National Marine Fisheries Service (NMFS)-Seasonal Effects of Transport
About 3,000-6,000 unclipped spring/summer Chinook salmon, unclipped steelhead and clipped steelhead at PIT tagged each week during the outmigration. Corps biologist load the PIT tagged fish with the other raceways at Lower Granite onto the juvenile transport barges. Fish are transported through the FCRPS and released below Bonneville Dam. SAR rates of barged and in-river fish (collected and tagged at Granite) are used to determine juvenile transport strategies for the various salmonid populations

National Marine Fisheries Service (NMFS) In-River Survival: NMFS PIT tags about 20,000 each of unclipped spring/summer Chinook salmon, unclipped steelhead, and clipped steelhead smolts April through June. Fish are collected into raceways, PIT-tagged, and then held for 24 hours before being bypassed to the LWG tailrace. Fish travel times between dams and through the FCRPS are monitored. Fish are recaptured at Bonneville to understand FCRPS passage effects. These fish also serve as in-river controls for Seasonal Effects of Transport Research above.

USGS Describing PIT-tag Efficiency and Stable Isotopes of Migrating Juvenile Fall Chinook Salmon: To estimate 8-mm PIT detection efficiency at LWG bypass system a target of 322 subyearling fall Chinook were collected from facility sample June 12. USGS PIT tagged 319 subyearling Chinook June 13 and released 310 into the upwell area to volitionally pass through LWG PIT-tag detection system June 14. There were 3 mortalities prior to tagging and 6 mortalities after tagging. Subsequent detection data will be queried from PTAGIS. A target of 50 subyearling mortalities per week will be collected May 22 through August 1 from Lower Granite raceways and holding tanks, placed in plastic bags, labeled, and frozen for later analysis. Stable isotope signatures from mortalities will be used to explore the possibility of using stable isotopes to distinguish hatchery from natural-origin subyearlings.