**U.S. ARMY CORPS OF ENGINEERS**
**WALLA WALLA DISTRICT**
**FISH FACILITIES WEEKLY REPORT**
**#15-2017**

**Project: McNary**
Biologist: Bobby Johnson and Denise Griffith
Dates: June 2 – 8, 2017

## Turbine Operation

General Comments: The hard 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). |
| ☒ | ☐ | 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 |
|---|---|---|---|
| 6 | June 7 | 5.6 hours | Tap the hub. |
| 1, 4, 6 & 7 | June 8 | 3.2 hours total | Trash rack cleaning. |

## Adult Fish Passage Facilities

General Comments: McNary fisheries biologists performed measured inspections of the adult fishways on June 2, 4 and 7. Visual fish counts continue. We noted the adult ladder temperature data collection shuttle beginning to fail on June 2. We will use one of two juvenile data shuttles for the remainder of the season.

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 shoreline were variable, reaching heavy at times. 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. Scheduled maintenance was performed on the exit weirs on June 5.

At the Oregon exit, debris loads were very light. Along the shoreline, debris loads were minimal. Exit weir 337 was switched to manual mode on June 4 due to excessive noise from the gearbox. The exit remained in criteria. The gearbox was examined and repaired on June 5, and returned to automatic mode. Scheduled maintenance was performed on the exit weirs on June 6. The tilting weir set point was adjusted on June 2, 4 and 5. The regulating weir set point was adjusted on June 4 and 5. The count station back board gap was returned to 18 inches on June 8. However, the drive shaft broke so the back board cannot be move again until the drive system is repaired during the winter maintenance season.

The Oregon exit traveling screens debris trough was cleaned as required.

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') |
| ☒ | ☐ | NFEW3 Weir Depth (Criteria – ≥ 8.0') |
| ☒ | ☐ | South Oregon Entrance Head Differential (Criteria – 1.0' to 2.0') |
| ☐ | ☒ | SFEW1 Weir Depth (Criteria – ≥ 8.0'): 7.0' on June 7. |
| ☐ | ☒ | SFEW2 Weir Depth (Criteria – ≥ 8.0'): 7.1' on June7. |
| ☒ | ☐ | Oregon Collection Channel Velocities (Criteria –1.5 to 4.0 fps): Averaged 1.6 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 out of criteria on June 7 were due to fish pump 2 test preparations. With one discharge log removed from fish pump 2, high tailwater elevations and test preparations, entrances weirs SFEW1 and SFEW2 would at times be out of criteria at 7.0 to 7.9 feet in depth. For example, on June 6, both weirs were measured at 7.5 feet in depth during 6140V breaker testing. The south pool differential was maintained in criteria during the fish pump 2 testing. On June 7, slack was noted in the weir cables at NFEW3. We will monitor NFEW3 and take action if required.

At the Washington ladder, woody debris has been noted on the stationary weirs downstream of the count station at times. The debris appears to be across the orifices but not impending fish passage. This debris cannot be reached for removal. Fortunately, the debris dislodged over time. Scheduled maintenance was performed on the entrance weirs on June 5.

On June 2, two clipped subyearling Chinook mortalities were found on the deck near Washington ladder entrance. We suspect these fish washed onto the deck from spillbay 1. We will monitor the area.

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 27 to 32 degrees. |
| ☐ | ☒ | Oregon Ladder Fish Pump 2: Testing occurred June 5 to 8. Water testing to begin June 12. |
| ☒ | ☐ | Oregon Ladder Fish Pump 3: Blade angle was 28 to 30 degrees. |
| ☒ | ☐ | Oregon North Powerhouse Pool supply from juvenile fishway. |

Comments: Fish pump 3 was out of service from 1300 to 1319 hours on June 6 and from 1645 to 1715 hours on June 7 in order to test its 6140V breaker at fish pump 2, which had issues with its 6140 breaker most of the week. With the 6140V breaker functioning properly, on June 8, fish pump 2 was operationally tested from 0734 to 0934 hours and from 1604 to 1617 hours. Minor mechanical and electrical issues have pushed further testing into next week. The seven remaining discharge logs are scheduled for removal on June 12.

**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, 7,500 juvenile lamprey and 121,806 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 were minimal. Debris loads at the spillway ranged from light to very heavy. On June 8, an emergency spill was used to remove the spillway debris. The remaining debris would be described as minimal. New debris is coming in along north shoreline and would be described as light to heavy. Operators continue to flush debris down the navigation lock as needed.

On June 8, trash racks were cleaned at units 1, 4, 6 and 7. One ten-yard truck load of woody debris was removed. No fish were observed in the debris.

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. On June 6, the ESBSs in units 4, 10 and 14 were found not communicating with the control system. This issue was immediately resolved.

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: Orifices were adjusted as required during trash rack cleaning. We continued to operate the transition screen cleaning brush manually to insure it completes a full cleaning cycle. A new solenoid has been ordered.

Bypass Facility:

| Yes | No | Item |
|---|---|---|
| ☒ | ☐ | Sample gates on? Yes, during secondary bypass only. |
| ☐ | ☒ | PIT tag system on? Pit tag 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 6, very slight weld cracks on one of four perforated plate sections were smoothed out.

## 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. Flows and spill are recorded in one-thousand cubic feet per second (kcfs). Temperatures are recorded in degrees Fahrenheit.

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 |
| 464.0 | 420.9 | 294.7 | 254.8 | 57.4 | 55.9 | 2.9 | 2.2 |

Comments: Spill in excess of powerhouse capacity occurred all week. Routine spring spill in support of fish passage continues. Forty percent of river flow is spilled in the spring season. This week, 61 to 64 percent of flow was spilled. The control room received another expanded spill table (Fish Passage Plan Table MCN-10) for TSW removal on June 8.

Spillway debris was spilled on June 8, from 1256 to 1626 hours. The project staff rotated through bays 2, 4, 5, 6, 7 and 11 with split leaf mode and adjacent bays closed. Each bay was opened to approximately 18 feet and passing approximately 18 kcfs. On average, each bay was split leaf with adjacent bays closed for 35 minutes.

Anchor QEA deployed temperature probes on June 8 and will begin to report data on June 15.

## Other

Inline Cooling Water Strainers: On June 6, during the cooling water strainer examinations, 19 juvenile lamprey, 5 clipped subyearling Chinook and 15 non-clipped subyearling Chinook mortalities were removed. The lamprey were removed from each unit and the subyearling all came from unit 1.

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.

In the forebay zone, 15 to 60 grebes were observed along with an occasional osprey, gull, 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 gulls and cormorants were observed on the rocks by the Washington shore boat dock.

Three grebes entered the gatewell slots this week. One grebe was removed from the slots. Two grebes passed to the juvenile collection channel and were removed.

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.

In May, WS personnel lethally took four cormorants and 64 gulls from the tailwater area.

On June 7, the water sprinkler pump intake was cleaned after it was noted the sprinkler stream appeared weak. On June 8, the water stream continued to appear weak. At 0910 hours, we removed the pump and water hazing sprinkler from service. The pump will be examined on June 12.

Table 3. McNary Project's Daily Avian Count.

| Date | Zone | Gull | Cormorant | Tern | Pelican |
|---|---|---|---|---|---|
| June 2 | Spill | 0 | 0 | 1 | 1 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 3 | Spill | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 4 | Spill | 18 | 0 | 2 | 1 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 2 | 1 | 0 | 0 |
| June 5 | Spill | 1 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 6 | Spill | 0 | 0 | 0 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 7 | Spill | 0 | 0 | 0 | 4 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 0 | 0 |
| June 8 | Spill | 0 | 0 | 5 | 0 |
| | Powerhouse | 0 | 0 | 0 | 0 |
| | Outfall | 0 | 0 | 3 | 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.

**Project: Ice Harbor**
Biologist: Ken Fone
Dates: June 2 – June 8, 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 1 was out of service from 2313 hours on June 5 to 1430 hours on June 6 due to the STS in slot 1A tripping off because of a bad motor. Unit 3 was routinely operated a little above the 1% peak operating efficiency range during the reporting period, 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 5, 6, and 7.

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 June 5, the SFE-1 weir gate depth was out of criteria at 7.5’. The gate is in manual control, and the gate depth came into criteria when the tailwater elevation came up shortly afterwards.

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, except during the brief period noted below.

Comments: North shore AWS pump #3 tripped off at 1840 hours on June 6 when woody debris in the tailrace was sucked up by the pump and clogged the pump. Pump #2 was started in place of pump #3 at 1909 hours on June 6. On June 7, an emergency alteration of the spill pattern occurred from 1037 hours to 1140 hours to flush the debris out of the tailrace (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 75 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: 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: 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. On June 6, the STS in slot 1A was replaced with a spare STS because of a faulty motor.

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.

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

June 5:

| Species | Sampled | #Descaled | Morts | Avian Marks |
|---|---|---|---|---|
| C-CH | 0 | --- | --- | --- |

| | | | | |
|---|---|---|---|---|
| UC-CH | 1 | 0 | 0 | 0 |
| C-CH-O | 55 | 0 | 0 | 0 |
| UC-CH-O | 47 | 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 | 106 | 0 | 0 | 0 |

June 8:

| Species | Sampled | #Descaled | Morts | Avian Marks |
|---|---|---|---|---|
| C-CH | 0 | --- | --- | --- |
| UC-CH | 0 | --- | --- | --- |
| C-CH-O | 44 | 0 | 0 | 0 |
| UC-CH-O | 58 | 0 | 0 | 0 |
| C-SH | 2 | 0 | 0 | 0 |
| UC-SH | 2 | 0 | 0 | 0 |
| C-SOCK | 1 | 0 | 0 | 0 |
| UC-SOCK | 0 | --- | --- | --- |
| C-COHO | 0 | --- | --- | --- |
| UC-COHO | 0 | --- | --- | --- |
| TOTAL | 107 | 0 | 0 | 0 |

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

**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 |
| 183.4 | 153.7 | 128.4 | 100.7 | 58 | 57 | 2.4 | 2.3 |

*Unit 1 scroll case temperature.

**Other**

Inline Cooling Water Strainers: Turbine cooling water strainer inspections last occurred on May 16 and 17. A total of 2 juvenile salmon (1 was identifiable as clipped), 2 juvenile steelhead, 12 juvenile lamprey, and 1 Siberian Prawn were found (all dead). Transformer cooling water strainers were inspected on June 6 and 7. One live juvenile lamprey was recovered and released to the river in good condition.

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 numbers remained very low this week and cormorant numbers decreased from last 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. A few cormorants below the juvenile fish outfall pipe have been somewhat difficult to haze out.

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

| Date | Gulls | Cormorants | Caspian Terns | Grebes | Pelicans |
|---|---|---|---|---|---|
| June 2 | 0 | 8 | 0 | 3 | 26 |
| June 3 | 0 | 16 | 0 | 0 | 38 |
| June 4 | 3 | 3 | 0 | 0 | 23 |
| June 5 | 0 | 7 | 0 | 1 | 30 |
| June 6 | 0 | 3 | 0 | 0 | 2 |
| June 7 | 0 | 1 | 0 | 0 | 3 |
| June 8 | 0 | 0 | 0 | 0 | 0 |

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

**Project: Lower Monumental**
Biologists: Chuck Barnes and Raymond Addis
Dates: June 2 - 8, 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 October 3, 2017. Unit 5 was removed from service on January 17, 2017 due to a turbine oil leak with an estimated return to service of July 30, 2017. Units 2, 3, 4 and 6 were rotated out of service for STS inspections and trach rack cleaning on June 6, 7 and 8. Unit 6 was removed from service at 1128 on June 6 due to an oil leak with an estimated return to service date of June 12.

## Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on June 2, 3, 4 and 7.

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:

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 Shore Channel/Tailwater differential was out of criteria on the June 3, 4 and 7 inspections with readings of 0.6, 0.4 and 0.0 feet respectively. This was 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 84 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: Gatewell drawdown measurements for gatewells 3B and 3C were out of criteria with a reading of 2.3 feet on the June 4 measurements. Trash racks were cleaned on June 6, 7 and 8. Gatewell woody debris was removed on June 8 after trash rack cleaning was complete.

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:

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 17 was observed with low flow on the June 3 inspection. Powerhouse operator was informed and was able to clean out the blockage.

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 119,900 fish were collected, of which 106,671 were transported during this reporting period.

## 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 |
| 179.4 | 153.2 | 112.8 | 88.4 | 58.0 | 57.1 | 1.7 | 1.2 |

*Scrollcase temperatures.

## Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on June 6. No live fish were recovered. Mortalities included 15 juvenile salmon.

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

Avian Activity: Cormorants, gull 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 |
|---|---|---|---|---|---|---|
| 6/2/2017 | 1150 | 0 | 0 | 0 | 0 | 0 |
| 6/3/2017 | 1205 | 0 | 0 | 0 | 0 | 0 |
| 6/4/2017 | 1230 | 0 | 0 | 0 | 0 | 0 |
| 6/5/2017 | 1130 | 0 | 0 | 0 | 0 | 1 |
| 6/6/2017 | 1240 | 0 | 0 | 0 | 0 | 1 |
| 6/7/2017 | 1100 | 0 | 1 | 0 | 0 | 0 |
| 6/8/2017 | 1245 | 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 02 – June 08, 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 unit 5. 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 04, 07 and 08.

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: Monthly water velocity measurements were taken with the Rickly velocity meter near NPE on May 20. Average velocity from bottom, mid channel and top was 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 120,000 square feet of floating woody debris currently in the forebay. Trash raking was completed the week of June 05. Trash raking is scheduled again for June 13. Trash rack differential was measured June 06 on units 1 and 2. All trash rack differential measurements were within criteria.

Spillway Weir: 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 06 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 large amounts of debris, 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 report period. A total of 223,838 fish were collected, of which 197,564 were transported. The descaling and mortality rates were 0.5% and 0.5% 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 |
| 178.8 | 149.7 | 94.3 | 64.0 | 59.0 | 57.0 | 1.8 | 1.2 |

*Ladder temperature.

Comment: None.

**Other**

Inline Cooling Water Strainers: Cooling water strainers were inspected on June 03. Total strainer mortality included 1 salmon smolt.

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 |
|---|---|---|---|---|---|
| 06-02 | 14:00 | 1 | 0 | 0 | 0 |
| 06-03 | 12:30 | 0 | 0 | 0 | 0 |
| 06-04 | 09:00 | 0 | 0 | 0 | 0 |
| 06-05 | 13:00 | 0 | 0 | 0 | 0 |
| 06-06 | 13:00 | 2 | 0 | 0 | 0 |
| 06-07 | 13:30 | 0 | 0 | 0 | 0 |
| 06-08 | 14:00 | 0 | 0 | 0 | 0 |

Gas Bubble Trauma: GBT sampling was conducted on June 05. There were 100 fish examined, 1 of which showed signs of GBT.

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

**Project: Lower Granite**
Biologists: Elizabeth Holdren
Dates: June 2-8, 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 to 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 2, 3, 4, and 7.

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 supply 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 202.0 square yards this week. Mechanical removed about 438 cubic yards (15 truckloads) of debris from the powerhouse forebay over the last couple weeks to reduce potential for debris impacting juvenile passage through the gatewells, orifices, and collection facility. See spill events to reduce forebay debris described below.

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: N/A

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 and transported the following day.

Transport Summary: Every other day transport is occurring with barges departing on odd 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 |
| 179.2 | 154.27 | 87.60 | 65.00 | 56.5 | 54.0 | 1.8 | 1.4 |

*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 is occurring.

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

| Date | Time (hours) | Gulls | Cormorants | Caspian Terns | Pelicans |
|---|---|---|---|---|---|
| June 2 | 1210 | 2 | 0 | 0 | 9 |
| June 3 | 1230 | 0 | 1 | 0 | 4 |
| June 4 | 1525 | 0 | 0 | 0 | 5 |
| June 5 | 1308 | 0 | 0 | 0 | 0 |
| June 6 | 1136 | 0 | 0 | 0 | 4 |
| June 7 | 1145 | 1 | 1 | 0 | 0 |
| June 8 | 1535 | 1 | 0 | 0 | 11 |

Spill: June 3 from 0600-0700 hours emergency debris spill operations were implemented through spillway 3 to move over 2500 square yards of debris in front of the spillway. June 4 from 1754-1856 hours emergency debris spill operations were again implemented through spillway 3 due to additional debris accumulating in front of the RSW. Another debris spill was implemented June 8 from 0711-0826 hours. Operations deviated from the Fish Passage Plan (FPP) spill pattern with RSW closed and spillway 3 full open during the emergency spills. Spill volume remained unchanged during the debris spills. 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.

GBT: Fish are being sampled from the separator for GBT Thursdays.

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 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 by NPT to the 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 Bonnevill Dam. SAR rates of barged and inriver 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 inriver 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 300 subyearling fall Chinook salmon will be collected from facility sample June 12. USGS will PIT tag June 13 and release fish in the upwell area to volitionally pass through LWG PIT-tag detection system June 14. 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.