U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#04-2017

Project: McNary
Biologists: Bobby Johnson and Denise Griffith
Dates: March 17 - 23, 2017

Turbine Operation

General Comments: On March 17 at 1309 hours, transmission lines 1 through 5 tripped "off line" due to a 500 KV transmission system electrical fault, which removed units 1 through 12 from service. This resulted in a wide scale power outage throughout the project. All units were returned to service by 1456 hours. Hard 1% peak efficiency constraint begins on April 1.

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
13	Oct 3 to Mar 30	6 month	Thrust bearing issue.
2	Mar 21 to 31	10 days	Thrust bearing issue.

Adult Fish Passage Facilities

General Comments: McNary fisheries biologists performed measured inspections of the adult fishways on March 19, 21 and 23. Video fish counts continue. Visual fish counts will begin April 1.

On March 17, both ladders lost power during the unit outages described above. All systems were returned to service as quickly as possible. Other issues as a result of the power outage will be discussed below.

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'): 1.4' on March 21.
☐	☒	Washington Count Station Differential (Criteria – Differential 0.0' to 0.5') 0.6' on March 21.

Comments: Debris loads became increasingly heavy though the course of the week at the Washington exit and remained light at the Oregon exit. Large debris quantities were evident along the Washington shoreline. At the Washington exit, the trash rack and picketed leads were cleaned multiple times during the week. Due to debris loads and control system issues, Washington ladder exit and count station differentials did not meet criteria. In addition, multiple Washington ladder exit alarms were encountered. These alarms were reset without incident. Following the March 17 power outage, the encoder associated with weir 337 failed. The regulating and tilting weir set points appeared to be drifting as well. The electrical staff is working to resolve control system programming issues affecting weir and ladder exit operations. Because of these difficulties, weir 337 remains in bypass mode. Out of necessity, the exit weir is placed in manual mode whenever control system issues are being addressed. At the Oregon exit, the regulating weir and tilting weirs set points were adjusted on March 17, after the power outage. Oregon ladder exit alarms that were triggered by the power outage were cleared without incident.

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 March 21.
☐	☒	NFEW3 Weir Depth (Criteria – ≥ 8.0’): 7.9’ on March 21.
☒	☐	South Oregon Entrance Head Differential (Criteria – 1.0’ to 2.0’)
☐	☒	SFEW1 Weir Depth (Criteria – ≥ 8.0’): 7.6’ on March 21.
☐	☒	SFEW2 Weir Depth (Criteria – ≥ 8.0’): 7.7’ on March 21.
☒	☐	Oregon Collection Channel Velocities (Criteria –1.5 to 4.0 fps): Averaged 2.2 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 Washington ladder pool elevation sensor failed after the power outage on March 17. The entrance was switched to manual mode until the sensor was replaced on March 18. The Oregon ladder out of criteria points could possibly be explained by the lack of supplementation water at the north powerhouse entrance (NFEW1 and NFEW2) from the JBS (Juvenile bypass system). The JBS is not yet in service. Due to hydraulic gradients, weir set points at the south powerhouse entrance (SFEW1 and SFEW2) were adjusted to 7.6 feet on March 20 to maintain pool differential criterial. The previous setting was 8.0 feet. Due high tailwater elevations, SFEW2 tripped its upper limit switch on March 23 at 1802 hours. SFEW2 was subsequently placed in manual mode where it remains. The electrical staff will adjust the upper limit on March 27. The floating orifice gate (FOG) in slot 26 is jammed and not functioning properly. Attempts to move the FOG have so far been unsuccessful.

Auxiliary Water Supply System:

Yes	No	In Service?
☒	☐	Washington shore Wasco County PUD Turbine Unit: Unit was out of service for 24 hours.
☒	☐	Washington shore Wasco PUD Bypass: Operated satisfactorily on March 23 to 24.
☒	☐	Oregon Ladder Fish Pump 1: Blade angle was 24 degrees. Pump was down one hour on March 17.
☐	☒	Oregon Ladder Fish Pump 2: Return to service date is June 15.
☒	☐	Oregon Ladder Fish Pump 3: Blade angle was 24 degrees. Pump was down one hour on March 17.
☐	☒	Oregon North Powerhouse Pool supply from juvenile fishway: Return to service date is March 29.

Comments: The Wasco PUD turbine unit tripped multiple alarms on March 20, which were reset. The unit was out of service from March 23 at 0811 hours to March 25 at 0800 hours. Both fish pumps were out of service on March 17 from approximately 1335 to 1435 hours due to the power outage described above.

Juvenile Fish Passage Facility

General Comments: The winter maintenance season continues. The March 17 power outage at the facility lasted three minutes. No systems were effected. The collection channel will return to service on March 29.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	Item
☒	☐	Forebay debris load acceptable? Although the debris load is acceptable, removal is prudent.
☒	☐	Trash rack differentials measured? If so, were differentials acceptable? ☒ Yes for now. ☐ No ☐ N/A.
☐	☒	Any debris seen in gatewells?
☐	☒	Any oil seen in gatewells?

Comments: Heavy forebay debris loads near the powerhouse remain. The tug used to remove forebay debris or "log bronc" was test operated March 24, but no powerhouse debris was removed. The log bronc encountered engine problems and excessive debris which made the test unsuccessful. Powerhouse debris removal will be attempted at a later date. Although spillbay debris loads were light at the start of this report period, the quantity became noticeably heavier as the week progressed. On March 22, from 1430 to 1630 hours, bays 8 and 11 were open in split leaf configuration and the adjacent bays were closed. This removed approximately three quarters of the debris. The remaining load is fairly light. The Washington shoreline is now collecting most incoming debris and accumulations in this vicinity is heavy. The operators are flushing the debris down the navigation lock multiple times a day and are constantly monitoring the Washington ladder exit. The highest trash rack differential measured this week was 2.7 feet in slot 4A on March 22 with the unit operating at 77 megawatts. Trash racks will be cleaned from March 27 to March 29.

Extended-length submersible bar screen (ESBSs)/Vertical barrier screen (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 maintenance continues. ESBS deployments are scheduled to begin April 5. VBS differential monitoring will begin at that time.

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

Yes	No	Item
☐	☒	Orifices operating satisfactory? How many are in service? Closed for maintenance.
☐	☒	Dewaterer and cleaning systems operating satisfactory? Out of service for maintenance.

Comments: Collection channel remains out of served for winter maintenance. The side screen cleaning brush drive chain was adjusted this week. Ice in the channel should be thawed out by next week.

Bypass Facility: The facility remains out of service for winter maintenance. A water temperature monitoring station was installed in the sample recovery raceway.

River Conditions

General Comments: River conditions were provided by the McNary control room and are 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. 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
445.9	372.4	244.5	158.4	42.0	41.0	1.5	1.0

Comments: Spill in excess of powerhouse capacity occurred all week. As mentioned above, on March 22, bays 8 and 11 were opened in spilt leafed configuration with adjacent bays close for spillway debris removal.

Other

Inline Cooling Water Strainers: The next inspections are scheduled for April 4.

Invasive Species: Mussel stations will be examined on March 27.

Avian Activity: Gulls, cormorants, a loon and merganser were noted this week. Avian counts will resume in early April.

Fish Salvage/Rescue**:** On March 23, unit 2 was dewatered. No fish were found in the scroll case or in the draft tube.

Research

Item: No onsite research is occurring at this time.

Project: Ice Harbor
Biologists: Ken Fone
Dates: March 17 - 23, 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, when it tripped a breaker 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. Units 6, 5, 3, and 1 were taken out of service one at a time on March 21 and 22 to rake the turbine intake trash racks. Unit 3 was routinely operated a little above the 1% peak operating efficiency range during the reporting period, due to the GDACS (Generic Data Acquisition and Control System) 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 March 20, 21, and 23.

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 were clear of debris and the bubblers were operating satisfactorily. The picketed leads are raised out of the water until the start of fish counting.

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: SSE-1 weir gate depths were out of criteria during the March 20 and 23 inspections, with readings of 7.5’ and 7.2’, respectively. The NSE-1 weir gate depth was out of criteria on March 20, with a reading of 7.6’. The operating weir gates are in manual control to reduce the wear and tear on gate machinery trying to auto-adjust to the widely fluctuating tailwater levels from spill, and to prevent the gates from raising too far and becoming stuck due to water pressure against the gates. With the gates in manual control, the operator must monitor the electronic

outputs to detect any out of criteria readings and adjust gates to maintain criteria. The electronic readings may differ from the staff gauge readings due to the difficulty in obtaining accurate readings as water levels widely fluctuate.

Auxiliary Water Supply (AWS) System:

Yes	No	In Service and Operating Satisfactory?
☒	☐	South Shore AWS Pumps. Beginning on March 10, seven of the eight south shore AWS pumps were in service, except during the incident described in the comments below.
☒	☐	North Shore AWS Pumps. Two of the three north shore AWS pumps were in service.

Comments: All of the south shore AWS pumps were turned off when tailwater elevation exceeded 353', from 1415 hours on March 16 to 1314 hours on March 17, to prevent flooding of the warehouse inside the dam, per Section IHR 2.4.2 of the Fish Passage Plan.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	Item
☒	☐	Forebay debris load acceptable? Approximately 10 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)?
☐	☒	Any oil seen in gatewells?

Comments: A total of approximately 7 cubic yards of debris was raked from the turbine intake trash racks on March 21 and 22. The STSs stored in the gatewell slots obscure the view and prevent estimations of gatewell debris coverage.

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)? N/A
☐	☒	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: The STSs are raised out of the water and stored in their gatewell slots for annual maintenance.

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? N/A

Comments: The juvenile fish bypass was watered up and orifices were opened on March 22. The mechanical screen cleaner was not functioning properly in automatic mode. It was operated in manual mode until the limit switches were electronically adjusted on March 23. On March 23, the pump for the bird abatement hydrocannon at the bypass outfall pipe was installed and the hydrocannon was turned on.

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

Fish Sampling: Sampling operations are scheduled to begin the week of April 2.

Removable Spillway Weir (RSW): Involuntary spill continued, including spill through the RSW this week, due to high river flows. Routine spill for fish passage is scheduled to begin on April 3.

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
212.9	179.6	153.9	121.4	44.0	42.0	2.0	1.4

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections occurred on March 16. Mortalities recoveries included 1 Chinook fry and 80 juvenile lamprey. Four live juvenile lamprey were also recovered and released to the river.

Invasive Species: No new exotic species have been found.

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

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

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: March 17 - 23, 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 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 date of July 30, 2017.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on March 20, 21, 22 and 23.

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 weir (NSE1) head was out of criteria during the March 23 inspection. A reading of 7.8 feet was observed due to debris on fish pump turbine trash racks which did not allow two pumps to keep up with the high tailwater caused by elevated river flows.

South powerhouse entrance weir (SPE1) head was out of criteria on the criteria on March 22 inspection with a reading of 7.7 feet due to debris on fish pump turbine trash racks which did not allow two pumps to keep up with the high tailwater caused by elevated river flows.

North shore channel/tailwater differentials were out of criteria on three inspections this week due to the high tailwater caused by elevated river flows. The differentials for March 20, 21 and 22 were 0.7, 0.6 and 0.9 feet respectively.

South Powerhouse channel/tailwater differentials were out of criteria on two inspections this week due to the high level of the tailwater caused by elevated river flows. The differentials for March 21 and 23 were 0.8 feet.

South shore channel/tailwater differentials were out of criteria on three inspections this week due to the high level of the tailwater caused by elevated river flows. The differentials for March 20, 21 and 22 were 0.8, 0.9 and 0.8 feet respectively.

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? Average of 419 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: Prior to the deployment of STSs, water levels in gatewells associated with units 2 and 3 appeared low. Measured drawdowns were between 3.0 to 6.6 feet. STS deployments were halted until the trash racks for those units could be cleaned. The trash raking was carried out on March 21 and 22. All other gatewell differentials were acceptable.

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: STSs were deployed from March 21 to 23 and are now in service on all available units.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	Item
☒	☐	Orifices operating satisfactory? How many are open and in service? 12.
☒	☐	Dewaterer and cleaning systems operating satisfactory?

Comments: The collection channel was watered up on March 21 at 1000 hours. The numbers of opened orifices was limited due to STS deployments.

Collection Facility: The facility was "watered up" on March 21 at 1200 hours.

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

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
213.1	175.0	137.2	94.8	45.0	44.0	1.0	0.8

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on March 7. Live fish recoveries included 10 juvenile lamprey. Mortalities included approximately 1100 juvenile lamprey and 1 banded killifish .

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on March 1.

Avian Activity: Gulls 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

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

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: March 17 - 23, 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. Soft constraints of 1% peak efficiency criteria are in effect.

Adult Fish Passage Facility

The adult fishway was inspected by Corps biologists on March 21, 22 and 23.

Fish Ladder: No comments.

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: None.

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: On March 23, the south shore channel to tailwater differential measured 0.9 feet.

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. An estimated 30,000 sq. ft. of floating woody debris is in the forebay.
☒	☐	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: ESBS screens were lowered in all units. There is an estimated 30,000 square feet of floating woody debris currently in the forebay. Trash raking was last completed on February 13 and is scheduled again for May 8 and 9.

Spillway Weir: The weir was opened in the low crest configuration 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: None.

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: None.

Collection Facility: Water up of the Juvenile Fish Facility will take place on March 28.

Transport Summary: No fish collection is currently taking place.

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
192.2	164.6	70.4	36.2	45.5	45.2	1.0	0.7

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on March 21. Strainer mortalities included 94 juvenile lamprey, no smolts were seen.

Invasive Species: No invasive species have been observed "in season" on the mussel station or during winter maintenance.

Avian Activity: N/A.

Gas Bubble Trauma: N/A.

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

Project: Lower Granite
Biologist: Elizabeth Holdren and Suzette Frazier
Dates: March 17 - 23, 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 July 14. Unit 2 is out of service for blade seal repair with an expected return to service date of April 7. Units 2-6 were rotated out of service from March 20 to March 23 for ESBS installations. Unit 1 ESBSs will be installed March 24.

Adult Fish Passage Facility

General comments: None

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:

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 differentials. Gate depths and channel tailwater differentials were likely out of criteria. River flows and wave crests caused by spill and wind have increased tailwater elevations resulting in submerged and unreadable staff gauges.

Collection Channel Velocity: Collection channel velocity measurements met criteria this week.

Auxiliary Water Supply System:

Yes	No	In Service and Operating Satisfactory?
☐	☒	AWS Fish Pump 1 (Not operating – The Fish Passage Plan requires only 2 of these pumps in service).
☒	☐	AWS Fish Pump 2 (operating).
☒	☐	AWS Fish Pump 3 (operating).

Fish Ladder Temperature Control System: See above.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	Item
☐	☒	Forebay debris load acceptable? No debris was observed in the 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: An average of 136.7 square yards of debris were observed in the powerhouse forebay this week. About 4500 square yards of debris was spilled from in front of the spillways March 22. Gatewell slots were dipped for debris from March 20 to March 23, prior to ESBS installations.

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: ESBSs in units 2 - 6 were installed from March 20 to March 23.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

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

Comments: The collection channel was “watered up” at 0715 hours on March 20.

Collection Facility: The collection facility was “watered up” at 0915 hours on March 20 in secondary bypass mode. The facility was changed to primary bypass mode from 1040 hours to 1132 hours on March 21 due to debris on the incline screen. Some orifices have been found partially plugged this week, due to the large amount of debris in the forebay. Orifices continue to be cycled every three hours.

Transport Summary: No fish transport is occurring at this time.

River Conditions

General Comments: None.

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
189.2	174.9	107.8	85.5	43.9	42.3	1.0	0.5

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Inline cooling water strainers were sampled March 23. Mortality recoveries included 160 juvenile lamprey, no other fish were found.

Invasive Species: No comments.

Avian Activity: No comments.

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

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
Month XX					
Month XX					
Month XX					
Month XX					
Month XX					
Month XX					
Month XX					

GBT: No comments.

Adult Fish Trap Operations: The adult trap is operating at a 26% sample rate.

Fish Rescue Operation: No comments.

Research

Item: No onsite fish research is taking place at this time.