U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#14-2017

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: May 26 – June 1, 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
2 & 7	May 30	1.7 hours total	Extended-length submersible bar screens (ESBSs) camera inspections.

Adult Fish Passage Facilities

General Comments: McNary fisheries biologists performed measured inspections of the adult fishways on May 26, 28 and 31. Visual fish counts continue. Both count station backboards were cleaned this week.

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 were variable. Debris loads along the shoreline were light. 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. Encoders were replaced at tilting weir 334 and 340 on May 30. Both weirs were returned to automatic mode. The regulating and tilting weirs set points were adjusted on May 31.

At the Oregon exit, debris loads were minimal. Along the shoreline, debris loads were minimal to light. Scheduled exit weir maintenance occurred on June 1. The traveling screens tripped an alarm and were reset on May 26.

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’): 0.9’ on May 31.
☒	☐	SFEW1 Weir Depth (Criteria – ≥ 8.0’)
☐	☒	SFEW2 Weir Depth (Criteria – ≥ 8.0’): 6.9’ on May 31.
☒	☐	Oregon Collection Channel Velocities (Criteria –1.5 to 4.0 fps): Averaged 1.7 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 was out of criteria on May 31 due to fish pumps 1 and 3 being out of service as described below.

Auxiliary Water Supply System:

Yes	No	In Service?
☒	☐	Washington shore Wasco County PUD Turbine Unit.
☒	☐	Washington shore Wasco PUD Bypass.
☒	☐	Oregon Ladder Fish Pump 1: Blade angle was 27 to 29 degrees.
☐	☒	Oregon Ladder Fish Pump 2: Testing scheduled to begin June 5.
☒	☐	Oregon Ladder Fish Pump 3: Blade angle was 29 to 31 degrees.
☒	☐	Oregon North Powerhouse Pool supply from juvenile fishway.

Comments: The Wasco County PUD turbine unit was briefly out of service on May 31 in preparation to clean the unit intake trash racks. From 1259 to 1326 hours, on June 1, the unit was out of service to clean the three conduit intakes. Conduit 4 was cleaned as the unit went down and conduit 3 was cleaned as the unit came up. Conduits 3 and 4 feed the unit. Conduit 1 which feeds the bypass along with conduit 3 was cleaned after the unit returned to service. The trash rack cleaning device only covers half of each conduit opening. The cycle from full unit operation to full bypass and back takes ten minutes total, which is the amount of time auxiliary flow would have possibly been effected. The bypass system functioned satisfactorily during these outages.

On May 27, the Oregon ladder south entrance pool differential drifted in and out of criteria. The operators increased fish pumps 1 and 3 blade angles, which resolved the issue. Fish pumps 1 and 3 were out of service from 1505 to 1545 hours on May 31 for the removal of one discharge log from fish pump 2. During the outage, a wiring issue was resolved for fish pump 1. Early in the day, all intake stoplogs were removed from fish pump 2. For initial testing, only one of eight discharge logs will be removed. A head cover water leak has delayed fish pump 2 testing into next week. After the fish pump outage, on June 1, the biologist noted SEFW1 and SFEW2 were at 7.5 feet, and out of criterion. The operators increased fish pumps 1 and 3 blade angles, which resolved the issue.

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, 1,325 juvenile lamprey and 47,803 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 were light. Debris loads along the Washington shoreline were moderate to heavy. New debris is coming in along this shoreline and would be described as light. Operators continue to flush debris via the navigation lock as needed.

No trash racks were cleaned during this reporting period.

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, 12B, 14A slots and in unit 11 remain in timer mode. The brush on the ESBS in 7B slot was switched to timer mode on May 28 after repeated alarms. The ESBS brush cycle for the screen in 2A slot was switched from timer to automatic mode on June 1.

The screens in 9B and 10B slots both tripped alarms on May 30 due to a relay issue, which was resolved immediately.

ESBS camera inspections at units 2 and 7 on May 30 found no issues.

VBS differential monitoring continued. No problems were found. The VBS screens in 6A and 6B slots were cleaned on June 1. One juvenile lamprey mortality was noted.

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 VBS cleaning. Orifice attraction lights were replaced as needed. The rectangular screen cleaning brush jammed on debris while traveling downstream on May 27 and 31, tripping timing alarms each time. The fisheries technician and roving operator reset the brush each time. The timing alarm was tested on June 1 and was found to be set at four minutes. The brush cycle operates for two minutes. Rectangular brush cycling was reviewed with the fisheries staff. 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 because 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.

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
443.1	409.6	273.9	240.8	57.1	54.6	3.5	2.9

Comments: Spill in excess of powerhouse capacity occurred all week. Routine spring spill in support of fish passage continues with the target of 40% of river flow spilled in the spring season. This week, 59 to 62 percent of flow was spilled. The control room received an expanded spill table for TSW removal on May 30.

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

Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur on June 6.

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 75 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.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican
May 26	Spill	0	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 27	Spill	0	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 28	Spill	0	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 29	Spill	0	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 30	Spill	0	0	0	0
	Powerhouse	0	0	0	0

	Outfall	0	0	0	0
May 31	Spill	0	0	2	0
	Powerhouse	0	0	0	0
	Outfall	4	0	3	0
June 1	Spill	0	0	0	3
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0

Ten grebes entered the gatewell slots this week. Eight grebes were removed from the slots and two grebes were removed from the juvenile collection channel.

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. Two crew members joined the hazing staff on May 30. Due to low bird numbers in the tailwater area, the boat crew has been assisting with grebe hazing from the forebay deck. High tailwater due to the high flow levels combined with wave action at the bypass outfall has not allowed for hazing from the outfall walkway. A freezer was brought to the juvenile fish facility on June 1 for storage of lethally taken birds until they can be disposed.

Fish Salvage/Rescue**:** No fish salvages occurred during this reporting period.

Gas bubble trauma (GBT) monitoring: GBT monitoring continues twice a week during the spill season. During this reporting period none of the 200 fish examined showed signs of GBT.

Research

Item: No onsite research is occurring at this time.

Project: Ice Harbor
Biologist: Ken Fone
Dates: May 26 – June 1, 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 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 May 30, 31, and June 1.

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: The south shore channel velocity was out of criteria on May 30, with a reading of 1.4 fps. This reading can most likely be attributed to the high channel water backing up into the fish ladder.

Auxiliary Water Supply (AWS) System:

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

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	Item
☒	☐	Forebay debris load acceptable? An average of 48 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.

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.

May 29:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	18	1	0	0
UC-CH	15	0	0	1
C-CH-O	2	0	0	0
UC-CH-O	19	0	0	0
C-SH	52	3	0	0
UC-SH	47	3	0	0
C-SOCK	3	0	0	0
UC-SOCK	0	---	---	0
C-COHO	1	0	0	0
UC-COHO	0	---	---	0
TOTAL	157	7	0	1

June 1:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	2	0	0	0
UC-CH	9	0	0	0
C-CH-O	19	0	0	0
UC-CH-O	60	1	0	0
C-SH	5	0	0	0
UC-SH	9	0	0	1
C-SOCK	0	---	---	---
UC-SOCK	1	0	0	0
C-COHO	0	---	---	---
UC-COHO	0	---	---	---
TOTAL	105	1	0	1

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* (^oF)		Water Clarity (Secchi disk - feet)	
High	Low	High	Low	High	Low	High	Low
172.7	136.5	117.6	88.2	57	54	2.4	2.2

*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).

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. Total pelican numbers increased from last week, with most of them observed foraging around the first island downstream of the dam (Eagle Island). Contracted land-based hazing of piscivorous birds is occurring for 16 hours per day. Boat-based hazing for 8 hours per day, five days per week

through May 26 and then three days per week beginning May 28. Land-based hazing has generally been effective at keeping birds out of the zones immediately adjacent to the dam. Boat-based hazing has been effective for zones further downstream of the dam. A few grebes in the forebay area adjacent to the powerhouse and up to 8 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
May 26	2	23	0	3	23
May 27	0	8	0	4	12
May 28	0	6	0	0	35
May 29	0	14	0	1	38
May 30	0	10	0	4	1
May 31	0	9	0	2	22
June 1	1	9	0	0	66

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

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: May 26 – June 1, 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. Unit 6 was removed from service on June 1 from 0410 to 1145 due to a field ground issue.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on May 26, 27, 28 and 31.

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: The North Shore Channel/Tailwater Differential was out of criteria on the May 27 inspection with a reading of 0.9 feet due to the automated system not working well with the high tailwater 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 173 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: Gatewells 3C, 4A and 4B were dipped to remove woody debris on May 27.

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 11 was found with a piece of thick woody debris by the powerhouse operator during an orifice check on May 26, which could not be dislodged at the time. The orifice was closed as far as possible and the attractant light was turn off with orifice 12 taking its place. The piece of debris was cut away on May 27 and the orifices were returned to normal collection positions.

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

Transport Summary: Every-day barging changed to every other day barging on May 26. A total of 87,870 fish were collected, of which 87,792 were transported during this reporting period.

River Conditions

General Comments: River conditions during this reporting period are summarized in Table 1.

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
174.2	130.9	103.4	57.5	59.1	55.9	2.5	1.3

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on May 17. No live fish were recovered. Mortalities included 10 juvenile lamprey, 8 juvenile salmon and 2 juvenile steelhead.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on May 7.

Avian Activity: Gulls, cormorants and grebes 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
5/26/2017	1210	0	0	0	0	0
5/27/2017	1249	0	0	0	0	0
5/28/2017	1250	0	0	0	0	0
5/29/2017	1100	0	0	0	0	0
5/30/2017	1215	1	0	0	0	0
5/31/2017	1300	0	1	0	0	0
6/1/2017	1250	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: May 26 – June 01, 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 out of service (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 May 21, 23 and 25.

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 94,500 square feet of floating woody debris currently in the forebay. Trash raking was completed on units 1 and 2 on May 31. Trash raking is scheduled again for the week of June 05. Trash rack differential was measured June 01 and was 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 01 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. Every-day barging changed to every other day barging on May 26. A total of 169,831 fish were collected, of which 169,038 were transported. The descaling and mortality rates were 0.7% and 0.4% respectively during this reporting period.

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
174.8	131.9	90.5	78.8	57.0	55.8	1.9	1.6

*Ladder temperature.

Comment: None.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on May 19. 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
05-26	12:30	0	0	0	0
05-27	12:30	0	0	0	0
05-28	14:00	0	0	0	0
05-29	12:30	0	1	0	0
05-30	14:00	0	0	0	0
05-31	14:30	1	0	0	0
06-01	12:00	0	0	0	0

Gas Bubble Trauma: GBT sampling was conducted on May 29. No signs of GBT were found in the 100 fish examined.

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

Project: Lower Granite
Biologists: Elizabeth Holdren
Dates: May 26-June 1, 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 3 was taken out of service May 31 from 1528-1550 hours for excessive oil in fly ball assembly case.

Adult Fish Passage Facility

General comments: Adult fish facilities were inspected by Corps or Anchor QEA biologists May 26, 27, 28, and 31.

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: The ladder cooling pumps remain out of service at this time due to river water temperatures currently below the 68° F the targeted threshold for tuning these pumps on.

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. The 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 pumps 1 and 3 are operating. AWS pump 2 is in standby mode.

Fish Ladder Temperature Control System: See above.

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 317.5 square yards this week. The mechanical crew continue to remove forebay debris from in front of the unit intakes.

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 operating 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-day barging changed to every other day barging on May 26.

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
176.7	136.5	85.7	49.9	55.1	52.0	2.1	1.8

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: N/A

Invasive Species: N/A

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
May 26	1453	0	0	0	2
May 27	1147	1	0	0	1
May 28	1420	2	0	0	0
May 29	1356	2	0	0	0
May 30	1440	1	0	0	2
May 31	1609	0	0	0	11
June 1	1539	0	0	0	17

GBT: Fish are being sampled from the separator for GBT Thursdays. No signs of GBT we seen 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 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 Dworshak National Fish 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 LGR 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 LGR.

National Marine Fisheries Service (NMFS) In-River Survival: NMFS PIT-tag Chinook and steelhead smolts for their Survival Study April through early June to compare smolt to adult returns of in-river migrating smolts to the smolt to adult returns of transported smolts. PIT-tagged fish are held for 24 hours before being bypassed to the LGR tailrace.