U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#10-2017

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: April 28 – May 4, 2017

Turbine Operation

General Comments: The hard 1% peak efficiency constraint began 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 May 12	7.3 months	Thrust bearing issue.
2	Mar 21 to May 12	1.7 months	Thrust bearing issue.
11	Apr 29, Apr 30 to May 1	41.7 hours total.	Exciter issue.
4 thru 10	May 1	9.4 hours total.	Trash racks cleaned.
1, 3 & 4	May 2	3.4 hours total.	Trash racks cleaned.

Adult Fish Passage Facilities

General Comments: McNary fisheries biologists performed measured inspections of the adult fishways on April 28, 30 and May 4. Visual fish counts continue.

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’): 0.7’ on May 4.

Comments: Debris loads at the Washington exit and along the shoreline were light to minimal. The trash rack and picketed leads were cleaned as needed, including nights and weekends. The high count station differential on May 4 was due to debris on the picketed leads, which were cleaned immediately. Electrical switching related to station service upgrades caused one brief power outage at the Washington exit on April 28. The power outage appeared to increase the interference at the count station passive integrated transponder (PIT) system. No solution has been found for the count station PIT-tag system interference issue. Tilting weir 334 was switched to manual mode after tripping alarms on April 30. This weir does not normally move at the standard forebay elevation range of 337.0 to 340.0 feet. The regulating and tilting weir set points were adjusted on May 4.

At the Oregon exit and along the south shoreline, debris loads were minimal to very light.

The Oregon ladder visitor center viewing window cleaning brush was repaired on May 2.

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’): 0.8’ on April 28.
☒	☐	SFEW1 Weir Depth (Criteria – ≥ 8.0’)
☒	☐	SFEW2 Weir Depth (Criteria – ≥ 8.0’)
☒	☐	Oregon Collection Channel Velocities (Criteria –1.5 to 4.0 fps): Averaged 1.9 fps.
☒	☐	Washington Entrance Head Differential (Criteria – 1.0’ to 2.0’)
☒	☐	WFE2 Weir Depth (Criteria – ≥ 8.0’)
☒	☐	WFE3 Weir Depth (Criteria – ≥ 8.0’)

Comments: The Oregon fishway south entrance head differential was out of criteria on April 28 and was likely due to the pool sensor drifting out of calibration.

Auxiliary Water Supply System:

Yes	No	In Service?
☒	☐	Washington shore Wasco County PUD Turbine Unit.
☐	☒	Washington shore Wasco PUD Bypass. Service not required.
☒	☐	Oregon Ladder Fish Pump 1: Blade angle was 27 degrees.
☐	☒	Oregon Ladder Fish Pump 2: Testing scheduled to begin May 16.
☒	☐	Oregon Ladder Fish Pump 3: Blade angle was 27 degrees.
☒	☐	Oregon North Powerhouse Pool supply from juvenile fishway.

Comments: Fish pump 1 was out of service on May 4, from 1648 to 1752 hours, while the pump was switched to another electrical bus. The contractor will turn over fish pump 2 to the project on May 15.

Juvenile Fish Passage Facility

General Comments: From May 3 to May 4, a supplemental water supply line valve above the A side bypass line was replaced. During this work, a wrench was dropped into the bypass line. From May 3, at 1500 hours to May 4, at 0900 hours, the sample gates were opened so all fish leaving the separator were diverted into the sampling system to avoid potential fish injury. Staff performed a camera inspection of the A and secondary bypass lines, ran ice blocks down the lines and flushed the lines after the valve was replaced. It appears the flow down the lines was sufficient to flush it out of the system because it was not observed or recovered. An estimated 277 smolts and one juvenile lamprey diverted into the sample were removed from the sample system and released. The majority of smolts were yearling chinook and steelhead. No mortalities occurred.

The fish passage season consists of alternating days of primary and secondary bypass modes, with the switch occurring at 0700 hours each morning. During this reporting period two deviations to this schedule occurred. On May 4, from 0700 to 0955 hours, the system remained in primary bypass to compete the valve replacement, delaying the scheduled switch to secondary bypass. A brief power outage on May 4, at 1655 hours caused the sample gates to be off from 1639 to 1707 hours, resulted in missing one sample with a sample rate of 0.5 percent.

This week, an estimated 184,204 smolts and 3,200 juvenile lamprey 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? Manmade and large woody materials were removed as needed.
☐	☒	Any oil seen in gatewells?

Comments: Forebay debris loads near the powerhouse were very light. Debris loads at the spillway were minimal. Most incoming debris is now along the Washington shoreline and would be described as light. The trash racks were raked for units 1 through 10 on May 1 and 2. There was 4.5 ten-yard truckloads of woody material, tumbleweeds and one log removed. No fish were observed in the debris.

The forebay debris removal log bronc water pump has been replaced and the bronc is available for use, however, the steering system needs to be repaired.

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

Yes	No	Item
☒	☐	ESBSs deployed in all slots? Screens were installed at unit 2 on May 4.
☐	☒	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 camera inspections are scheduled for May 16. The brush cycles for the screens in 3B and 12B slots remain in timer mode. The brush cycle for the screen in 1A slot was switched from timer to manual mode on May 2.

VBS differentials were monitored during the reporting period and no problems were found and no screens required cleaning. VBS inspections were conducted on units 2, 3, and 9 through 14 on May 3 and 4 and no problems were found.

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 and VBS inspections. Orifice attraction lights were replaced as needed.

Electrical switching related to station service upgrades caused three brief power outages on May 3, from 0805 to 0847 hours with no adverse effect.

Though functional, the fisheries staff continued to operate the transition dewatering screen cleaning brush manually to insure it completes a full cleaning cycle. The latch pin was lubricated on May 1. The electrical staff ordered a replacement solenoid on May 4. In addition, electrical staff determined the dewatering screen cleaning brush does not have a sequential alarm in its programming, which they will address.

Bypass Facility:

Yes	No	Item
☒	☐	Sample gates on? Yes, during secondary bypass only.
☐	☒	Passive integrated transponder (PIT) tag system on? The Pit-tag sort-by-code system remains off unless a study is occurring because facility bypass lines provide a superior route for the fish over the PIT-tag sample release lines.

Comments: During the bypass season, primary and secondary bypass modes return all fish 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.

The fisheries staff continued to clean the full flow flume upstream of the perforated dewatering screen as needed. The mechanics continue to evaluate the sample chiller issues. Sample water temperature are being monitored constantly and operations adjusted as needed.

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.

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
361.3	315.1	211.1	192.2	50.8	49.3	3.9	2.7

Comments: Spill in excess of powerhouse capacity occurred all week. Targeted routine spring spill in support of fish passage is 40% of the river flow and this week 58% to 63% of the river flow was spilled.

Anchor QEA has begun preparing temperature equipment for the juvenile system monitoring program.

Other

Inline Cooling Water Strainers: Turbine cooling water strainers were inspected on May 2 on operating units. A total of 42 juvenile lamprey and 8 clipped yearling Chinook mortalities were found. In addition, 1 live clipped yearling Chinook was recovered and released downstream of the dam.

Invasive Species: The next mussel station inspection will occur in late May.

Avian Activity: Avian counts continued and tailwater numbers are recorded in Table 3 below.

In the forebay zone, an occasional osprey, gull, blue heron, loon and a small flock of grebes were observed. A mating pair of loons are observed in the area. A fair numbers of gull, cormorants and pelicans were observed on the rocks by the Washington shore boat dock.

United States Department of Agriculture – Animal and Plant Health Inspection Service – Wildlife Services (USDA–APHIS–WS) personnel began bird hazing seven days a week on April 16. The second shift began on April 30 and the first day of hazing from the boat was May 1. The boat hazing occurs 3 days per week. Wave action and high river flows has not allowed hazing from the bypass outfall walkway due to safety concerns.

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican
Apr 28	Spill	11	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
Apr 29	Spill	5	0	0	0
	Powerhouse	0	0	0	0
	Outfall	6	0	0	0
Apr 30	Spill	30	0	0	1
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 1	Spill	23	0	0	0
	Powerhouse	0	0	0	0
	Outfall	7	0	0	0
May 2	Spill	13	0	0	0
	Powerhouse	0	0	0	0
	Outfall	3	0	0	1
May 3	Spill	13	0	0	0
	Powerhouse	0	0	0	0
	Outfall	7	0	0	0
May 4	Spill	1	0	0	1
	Powerhouse	0	0	0	0
	Outfall	1	0	0	0

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

Research

Item: No onsite research is occurring at this time. Pacific Northwest National Laboratory collected nine juvenile lamprey from the sample for an offsite tagging study this week.

Gas bubble trauma (GBT) monitoring continues and will occur twice a week during the spill season. No fish exhibited signs of GBT during this reporting period.

Project: Ice Harbor
Biologist: Ken Fone
Dates: April 28 – May 4, 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 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 out of service on May 2, from 0737 hours to 1532 hours, to reduce the water leaking into the turbine pit by adjusting the main unit packing. On May 4, unit 1 was off from 2044 hours to 2107 hours as a result of lightning striking line 1. 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 since it became a fixed-blade unit.

Adult Fish Passage Facilities

Fish facility personnel inspected the adult fishways on May 2, 3, and 4.

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 2 with a reading of 1.3 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 42 square yards of debris was observed.
☒	☐	Trash rack differentials measured this week? If so, were differentials acceptable? ☒ Yes ☐ No ☐N/A
☒	☐	Any debris seen in gatewells (i.e: over 10% coverage)? Surface coverage ranged from 0% to 20%.
☐	☒	Any oil seen in gatewells?

Comments: None.

STSs/VBSs:

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

Comments: 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. The descaling rate increased this week. Personnel will continue to monitor the juvenile fishways and carry out the required checks for debris obstructions that may be causing descaling.

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 1:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	56	3	0	1
UC-CH	32	0	0	2
C-CH-O	0	---	---	---
UC-CH-O	0	---	---	---
C-SH	57	4	0	0
UC-SH	15	2	0	0
C-SOCK	0	---	---	---
UC-SOCK	1	0	0	0
C-COHO	0	---	---	---
UC-COHO	0	---	---	---
TOTAL	161	9	0	3

May 4:

Species	Sampled	#Descaled	Morts	Avian Marks
C-CH	66	10	0	3
UC-CH	27	1	0	1
C-CH-O	0	---	---	---
UC-CH-O	1	0	0	0
C-SH	38	1	0	1
UC-SH	7	0	0	0
C-SOCK	0	---	---	---
UC-SOCK	1	0	0	0
C-COHO	0	---	---	---
UC-COHO	0	---	---	---
TOTAL	140	12	0	5

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
136.5	111.2	93.0	66.3	52.0	51.0	2.7	2.3

*Unit 1 scroll case temperature.

Other

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

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

Avian Activity: Overall, there were moderate numbers of piscivorous birds counted around the project, but numbers varied from day to day (Table 3 below). Contracted land-based hazing of piscivorous birds is occurring for 16 hours per day. Boat-based hazing for 8 hours per day, three days per week, is occurring. Land-based hazing has generally been effective at keeping birds out of the zones immediately adjacent to the dam. Boat-based hazing was effective

at scaring birds out of zones further downstream of the dam. Hazing was periodically necessary to keep a few cormorants out of the forebay area adjacent to the south fish ladder exit.

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

Date	Gulls	Cormorants	Caspian Terns	Grebes	Pelicans
April 28	16	15	0	0	16
April 29	7	4	0	0	15
April 30	17	19	0	0	113
May 1	50	13	0	0	40
May 2	5	20	0	0	1
May 3	12	9	0	0	0
May 4	54	43	0	0	38

Up to several hundred foraging pelicans have been seen in the evening and early morning hours, generally scattered in the river, downstream of the outfall pipe to the second island downstream of the dam.

Other: A juvenile steelhead mortality was found on May 2, 2017, on the north fish ladder entrance deck, adjacent to spillbay 10. Spillbay 10 is operated most of the time while spill is occurring, and the tailwater level is currently higher than usual. The fish likely washed up with the periodic waves that splash over the handrail during high spill and high tailwater conditions.

Research

No on-site research is occurring at this time.

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: April 28 – May 4, 2017

Turbine Operation

Yes	No	Turbine Unit Status
☐	☒	All 6 turbine units available for service throughout the week (see comments below for outage details).
☒	☐	All 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 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 July 30, 2017. Units 2, 3, 4 and 6 were rotated out of service for STS inspections on May 2 and 3.

Adult Fish Passage Facility

The adult fishway was inspected by Corps and Anchor QEA biologists on April 28, 29, 30 and May 3.

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 NSE-1 depth was out of criteria on the April 28 inspection with a reading of 7.9 feet. This was caused by an automation error due to high tail water levels. South Powerhouse Entrance weirs SPE-1 and SPE-2 depths were out of criteria on the April 29 inspection with readings of 7.9 and 7.8 feet respectively. The operator found those weirs were in manual mode. The readings moved back into criteria after

they were returned to automatic mode. South Shore Entrance weir SSE-1 depth was out of criteria on the May 3 inspection. This was caused by an automation error due to high tail water 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 295 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? Gatewells for units 2 and 3 had woody debris removed on April 29.
☐	☒	Any oil seen in gatewells?

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: STS inspections took place May 2 and 3. The STS's in gatewells 3B and 3C are missing a couple of button clips, however, the few missing clip locations are spread out and will not affect the function of the screen. VBS inspections took place on May 2 and 3 at the request of the Chief of Operations due to high levels of woody debris at the beginning of the season. No problems were found with the VBS's.

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: Orifice 15 was observed with an obstruction on April 28. The operator was informed and the obstruction was cleared.

Collection Facility: Sampling for condition took place over 24 hour periods starting at 0700 hours on April 29. Collection into raceways for transport began at 0700 hours on May 1.

Transport Summary: Collection for transportation began on May 01. Transport began on May 2 with the first barge. A total of 568,800 fish were collected, of which 290,828 were transported during this reporting period.

River Conditions

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

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
131.0	107.2	57.6	49.6	52.2	52.0	3.0	2.4

*Scrollcase temperatures.

Other

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

Invasive Species: The zebra or quagga mussels monitoring station was not inspected during this reporting period.

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

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
4/28/2017	1105	5	0	0	0	0
4/29/2017	1230	4	0	0	0	0
4/30/2017	1300	14	0	0	0	0
5/1/2017	1115	0	0	0	0	0
5/2/2017	1142	3	0	0	0	0
5/3/2017	1115	5	0	0	0	0
5/4/2017	1120	7	0	0	0	0

Research

No on-site research is occurring at this time.

Project: Little Goose
Biologists: Scott St. John & Richard Weis
Dates: April 28 – May 4, 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 for units 1, 2 and 5. Unit 5 remains OOS due to excessive vibration. Units 1 and 2 were taken out of service (OOS) for trash raking on May 01 and remain out of service for VBS repairs. 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 April 30, May 3 and 4.

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: Channel to tailwater elevation at NPE were measured at 2.0 and 2.1 on May 03. Additionally, weir depth at NSE weirs measured 5.7 ft. Both NPE and NSE were adjusted and the adult fishway system is currently operating within all criteria points. Monthly water velocity measurements were not taken during this reporting period.

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 15,000 square feet of floating woody debris currently in the forebay. Trash raking was completed on units 1 and 2 on May 01. Trash raking is scheduled again for May 15. Trash rack differential was measured on all operating units April 28. All trash rack differential measurements were within criteria.

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

ESBS/VBS:

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

Comments: VBS differential measurements were conducted on April 28 for all operating units. Differentials on VBS 1B were out of criteria. VBS differentials will be measured again for the next report period. VBS camera inspections were conducted on May 1 for units 1 and 2. Damage was found on VBS screens in gatewells 1B and 2A. Both units remain OOS for VBS repair.

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: Orifices 3B1 and 3B2 were both plugged with debris at approximately 0700 hours on May 03. Orifices were immediately backflushed and returned to normal operation. Approximately 2,240 smolt mortalities were recovered from this incident (see MFR 17 LGS 07). Due to large amounts of debris, orifices are being backflushed and/or rotated every two hours. The dewatering structure is being cleaned every two hours during daytime operating hours.

Collection Facility: Juvenile Fish Facility is currently operating. On April 28, debris caused a junction box to clog and overflow. A total of 395 juvenile salmon and steelhead mortalities occurred due to the overflow and fish falling to the ground (see MFR 17 LGS 06).

Transport Summary: Collection for transportation began on May 01. Transport began on May 2 with the first barge. A total of 694,815 fish were collected, of which 229,633 were transported during this reporting period. The descaling and mortality rates were 3.0% and 0.79% 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
157.7	104.6	124.7	36.8	53.4	51.7	2.8	2.6

*Ladder temperature.

Comment: Spill in excess of powerhouse capacity has occurred since May 01.

Other

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

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 during this reporting period.

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

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
04-28	1345	52	6	0	0
04-29	1000	48	2	0	1
04-30	1000	46	8	0	1
05-01	1330	4	1	0	17
05-02	0800	40	2	0	6
05-03	1300	76	9	0	5
05-04	1314	94	1	0	0

Gas Bubble Trauma: GBT sampling was conducted on May 01. There were 100 fish examined for GBT, no signs of GBT were seen.

Research

No on-site research is occurring at this time.

Project: Lower Granite
Biologists: Elizabeth Holdren
Dates: April 28- May 4, 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 (RTS) July 14. Unit 1 return to service is delayed due to time needed to procure studs for replacement in the Kaplan.

Adult Fish Passage Facility

General comments: Adult fish facilities were inspected by Corps or Anchor QEA biologists April 28, 29 and May 1 and 3.

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 Exit Cooling Water Pumps in Service.
☐	☒	Ladder Exit Cooling Water Pumps Operating Satisfactorily.

Comments: Ladder cooling pumps are not in service at this time due to river temperatures currently below 68°F.

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. NPE 2 north operating cable was found broken April 17 and is operating on sill position at 628.0 feet. The Project will schedule repairs to the gate operating cables later in the season and will be coordinated in an MOC.

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.

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 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 averaged about 77.5 square yards this week.

ESBSs/VBSs:

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

Comments: Unit 1 ESBSs will be installed prior to returning to service.

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 are being checked and back flushed for debris every three hour due to high debris loads in the river.

Collection Facility: Collection for transport began at 0700 hours May 1 with the first barge departing May 2. April 28 about 18,706 fish were mistakably collected into the east raceway for NOAA transport study. Fish collected the night of April 28 were bypassed to the river when the mistake was identified April 29. Collection for NOAA tagging wasn't scheduled to occur until April 30 for tagging. As of April 29 fish are being collected Sunday-Thursday for NOAA.

Transport Summary: Every day transport began with the first barge departing May 2. A total of 1,072,500 fish were collected, of which 352,991 were transported during this reporting period.

River Conditions

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

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
136.7	111.6	52.1	33.6	51.0	49.0	3.0	2.2

*Cooling water intake temperature.

Other

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

Invasive Species: Zebra/quagga mussel substrate was inspected April 28. The inspection trap was found missing and a new one was deployed the same day.

Avian Activity: Comments. Daily hazing is occurring.

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

Date	Time (hours)	Gulls	Cormorants	Caspian Terns	Pelicans
April 28	0940	0	0	0	0
April 29	1430	4	0	0	0
April 30	1555	5	0	0	0
May 1	1400	5	0	0	1
May 2	1408	4	5	0	0
May 3	1302	2	1	0	0
May 4	1430	7	1	0	1

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.