U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#16-2019

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: June 14 to 20, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 14 turbine units available for service. (See table & comments below for details).	Hard	Soft
X		Available turbines operated within 1% peak efficiency? Constraint in effect.	X	

Table 1. McNary Unit Outages (OOS) and Return to Service (RTS).

	OOS		RTS		
Unit(s)	Date	Time	Date	Time	Outage Description
5	05/23	0943	08/15	NA	Turbine blade packing.
13	06/10	0610	06/25	NA	Governor and oil replacement.
6	06/17	0650	06/20	1418	Annual maintenance.
12	06/17	0701	06/25	NA	Oil replacement.
12, 13 & 14	06/18	1000	06/18	1054	ESBS camera inspections.

Comments: There are no problems to report.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on June 14, 16 and 18. Adult fish counting continued. Video review of night time lamprey passage began on June 15.

Fish Ladder Exits:

Yes	No	Location	Criteria	Comments
X		Oregon Exit	Head over weir 1.0’ to 1.3’	
X		Oregon Count Station Differential	0.0’ to 0.5’	
X		Washington Exit	Head over weir 1.0’ to 1.3’	
X		Washington Count Station Differential	0.0’ to 0.5’	

Comments: Debris loads were light near the Oregon and Washington exits. Picketed leads were cleaned as required, including on Saturday.

At the Washington exit, the regulating weir tripped an alarm, which was reset on June 14.

There are no other problems to report.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
X			North Oregon Entrance Head Differential	1.0' – 2.0'	
X			NFEW2 Weir Depth	≥ 8.0'	
X			NFEW3 Weir Depth	≥ 8.0'	
X			South Oregon Entrance Head Differential	1.0' – 2.0'	
X			SFEW1 Weir Depth	≥ 8.0'	
X			SFEW2 Weir Depth	≥ 8.0'	
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 2.4 fps.
X			Washington Entrance Head Differential	1.0' – 2.0'	
X			WFE2 Weir Depth	≥ 8.0'	
X			WFE3 Weir Depth	≥ 8.0'	

Comments: There are no problems to report.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
X			WA shore Wasco County PUD Turbine Unit
	X		WA shore Wasco PUD Bypass
		X	Oregon shore Fish Pump 1, OOS to October 31.
X			Oregon shore Fish Pump 2, Blade angle: 22°
X			Oregon shore Fish Pump 3, Blade angle: 23 to 24°
X			OR North Powerhouse Pool supply from juvenile fishway

Comments: The Wasco County PUD unit tripped off line on June 18 from 2057 to 2245 hours. The bypass system functioned satisfactorily during the unit outage.

Juvenile Fish Passage Facility

The sampling season consisting of alternating days of primary and secondary bypass continued. There were no interruptions in the schedule this week. However, the full flow flume adult flush line failed to open again on June 15, 17 and 19. Also, the valve failed to close on June 16 and 20. When going in and out of secondary bypass, the valve should automatically open and close to add or remove water to or from the full flow flume. The fisheries staff manually operated the valve instead. The valve only functioned properly in automatic mode twice this week. The issue will continue to be monitored and examined.

Water temperature monitoring throughout the juvenile passage facility continued. Daily water temperature reporting began on June 15. The smolt monitoring staff, Anchor, QEA, published weekly results in a separate report.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Powerhouse forebay debris load acceptable?	Minimal to light.
X			Trash rack differentials measured this week?	Daily.
X			Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: New incoming debris was minimal. The spillway debris load would be described as very light to light. Trash racks are scheduled to be cleaned on June 24. There are no problems to report.

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

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
X			ESBSs inspected this week?
X			ESBSs inspection results acceptable?
X			VBSs differentials checked this week?
X			VBSs differentials acceptable?

Comments: The brush cycles for the screens in 6A, 8A and 8C slots, along with units 10 and 13 remained in timer mode. The brush cycle for the screen in 8B slot was set to timer mode after repeated alarms on June 16. The camera inspections in units 12 through 14 revealed no problems on June 18.

Daily VBS differential monitoring continued. No high differentials were recorded. A total of five VBSs were cleaned on June 14 and 20. One smolt mortality was observed.

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

Yes	No	NA	Item	Number of orifices in service
X			Orifices operating satisfactory?	42
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: Orifices were adjusted as required for VBS cleaning. There are no problems to report.

The concern with the two side dewatering valves that control the channel elevation continued. Their percentages open appears to be drifting apart. The valve used to operate with very similar percentage openings. This raises questions about how these valves are programmed. The biologist tried to manually adjust the valves on June 20. However, when the valves were returned to automatic mode, the large difference in percentages open returned. To lower the north valve percentage open, the biologist had the east floor valve opened two additional inches. The side dewatering valve issue will continue to be monitored.

Bypass Facility:

Yes	No	NA	Item
X			Sample gates on?
		X	PIT-tag sampling system on?

Comments: The sample gates were operated only when in secondary bypass. The PIT tag system will remain out of service as there are no studies requiring its use. The issue with the full flow flume adult flush line are mentioned above. This week, 1,000 juvenile lamprey and 33,461 smolts were bypassed during secondary bypass.

A debris blockage was removed from the B side flume near the PIT tag slide gate on June 15. No harm to fish was noted.

TSW Operations: The two TSWs were closed for the season on June 10th.

River Conditions

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
230.9	171.3	153.0	97.9	63.8	60.2	6.0	5.0

Comments: The above data is supplied by Anchor, QEA except water clarity, which is provided by the control room. The spring flex spill program continued until June 16, at 0001 hours, at which time, the summer spill program began with 57 percent of the flow being spilled.

Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur on July 2.

Avian Activity: Avian observations continued. The counts are reflected in Table 3 below.

There was very little activity in the powerhouse zone. A few pelicans were noted along the Oregon shoreline or the north edge of the powerhouse flow. In the spill zone, gull numbers were stable and low. Tern numbers remained low. Pelicans numbers increased as they work along the navigation lock wing wall. All birds appeared to be feeding.

Table 3. McNary Project's Daily Tailwater Avian Counts.

Date	Zone	Gull	Cormorant	Tern	Pelican
June 14	Spill	13	0	2	15
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
June 15	Spill	15	0	0	15
	Powerhouse	0	0	0	0
	Outfall	1	0	0	0
June 16	Spill	27	0	4	15
	Powerhouse	0	0	0	4
	Outfall	0	2	0	0
June 17	Spill	4	0	0	19
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
June 18	Spill	14	0	0	30
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
June 19	Spill	21	0	2	24
	Powerhouse	0	0	0	0
	Outfall	0	0	0	1
June 20	Spill	15	0	0	30
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0

In the bypass outfall zone, the gulls were roosting on the full flow pipe at times. A small number of cormorants and pelicans were noted feeding at the outfall. However, when present, USDA Wildlife Services boat hazing greatly reduced the number of birds in the area.

The laser for bypass outfall hazing remained in place and functional. The block study for evaluating the laser began on June 17. Results of the study will be presented to FPOM by a district biologist in the future. The laser appears to displace the birds when it is operational. When the laser was off, pelicans moved to the outfall to feed.

The bird distress calls remained deployed along the navigation lock wing wall. Roosting on the wall has been very limited. A large bird distress call is also deployed at the end of the remaining outfall pipe walkway. Due to its late installation, it appears to be less effective. USDA Wildlife Services continued working two shifts and boat hazing four days a week. When high wind velocity does not allow for boat hazing, the boat crew assist the bank hazer.

In the forebay zone, grebes numbering from zero to 20 birds were observed. When no birds were noted, the area had just been hazed. Occasionally, an osprey, pelican or tern was observed. Also, pelicans, cormorants and gulls

were noted roosting outside the zone along the Washington shore line. One to two cormorants and/or pelicans were observed just outside the Oregon ladder exit.

This week, no grebes observed elsewhere on project.

Invasive Species: The next mussel station examinations will occur on June 23. So far this season, one Siberian prawn was removed from the sample and euthanized.

Fish Rescue/Salvage**:** Navigation lock tainter valve number 1 was dewatered on June 20. No fish were removed.

Research: The University of Idaho continued the adult lamprey passage study. Gas bubble trauma (GBT) examinations occurred twice. No smolts were observed with signs of GBT.

Project: Ice Harbor
Biologist: Ken Fone
Dates: June 14 – June 20, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	**Hard**	**Soft**
X		Available turbines operated within 1% peak efficiency? Constraint in effect.	X	

Ice Harbor Unit Outages (OOS) and Return to Service (RTS):

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
4	9/20/18	1619	---	---	Replace blade packing to fix oil leak
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind

Comments: Unit 6, 5, 2, and 1 were removed from service one at a time for STS inspections on June 18 and 19.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on June 17, 18, and 19.

Fish Ladders:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head ≤ 0.3’	
X		North Ladder Picketed Lead Differential	Head ≤ 0.3’	
X		North Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
X		South Ladder EXit Differential	Head ≤ 0.3’	
X		South Ladder Picketed Lead Differential	Head ≤ 0.3’	
X		South Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			South Shore Entrance (SFE-1) Weir Depth	≥ 8.0’ or on sill	
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	
	X		South Shore Channel Velocity	1.5 – 4.0 fps	0.8’, 1.1’
	X		North Powerhouse Entrance (NFE-1) Weir Depth	≥ 8.0’ or on sill	6.1’
	X		North Powerhouse Entrance Channel/Tailwater Differential	1.0’ – 2.0’	0.9’
X			North Shore Entrance (NEW-1) Weir Depth	≥ 8.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’ – 2.0’	

Comments: On June 18, the north powerhouse channel/tailwater differential was slightly below criteria. The operator was informed and he raised the NFE-1 weir to bring the differential into criteria while keeping the entrance weir depth in criteria. On June 19, the NFE-1 weir depth was out of criteria. The operator lowered NEW-1 weir to bring the depth into criteria while keeping the differential in criteria. NFE-1 weir is being operated in manual mode, instead of automatic mode, to reduce the wear and tear on the operating machinery from the weir constantly trying to adjust to the fluctuating tailwater level from spill.

The south shore channel water velocity was below criteria on the June 17 and June 18 inspections. The higher tailwater and channel levels slowed the velocity of water entering the junction pool from the upper ladder, resulting in the lower velocity readings at the meter.

Auxiliary Water Supply (AWS) System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
7 pumps	1 pump		Status of the 8 South Shore AWS Pumps
2 pumps	1 pump		Status of the 3 North Shore AWS Pumps

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	243 square yards
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0-10%
	X		Any oil seen in gatewells?	

Comments: None.

STSs/VBSs:

Yes	No	NA	Item
	X		STSs deployed in all slots and in service?
X			STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)?
X			STSs inspected this week?
	X		STSs inspection results acceptable?
		X	VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments: The STSs are being operated in continuous-run mode, because of the presence of subyearling chinook with an average fork length of under 120 mm in the Ice Harbor juvenile fish sample.

Unit 6, 5, 2, and 1 STSs and unit 2 VBSs were inspected on June 18 and 19. The STS in slot 6A, which was observed to have a few missing clips during the May inspections, was replaced with a spare STS on June 18. The pulled STS had more clips missing and was starting to separate at several of the seams, with one of the separations being 10-12" long. No fish were observed inside the STS.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	20
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Juvenile Fish Facility: The fish facility is being operated in primary bypass, except when collecting fish for sampling.

Fish Sampling: Sampling is occurring on Mondays and Thursdays each week. See the tables below for a summary of the sampling results. Fish condition sampling results at Ice Harbor Dam:

Date: June 17

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	0	---	---	---
Chinook yearling unclipped	0	---	---	---
Chinook subyearling clipped	1	0	0	0
Chinook subyearling unclipped	7	0	0	0
Steelhead clipped	2	0	0	0
Steelhead unclipped	0	---	---	---
Sockeye clipped	0	---	---	---
Sockeye unclipped	0	---	---	---
Coho clipped	0	---	---	---
Coho unclipped	0	---	---	---
Total	10	0	0	0

Date: June 20

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	1	1	0	0
Chinook yearling unclipped	0	---	---	---
Chinook subyearling clipped	7	0	0	0
Chinook subyearling unclipped	17	0	0	0
Steelhead clipped	1	0	0	0
Steelhead unclipped	0	---	---	---
Sockeye clipped	0	---	---	---
Sockeye unclipped	0	---	---	---
Coho clipped	0	---	---	---
Coho unclipped	0	---	---	---
Total	26	1	0	0

Removable Spillway Weir (RSW): Voluntary spill for fish passage is occurring.

River Conditions

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
88.6	67.0	64.2	44.6	62	61	6.1	5.2

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections for juvenile lamprey occurred on June 20. A total of 3 juvenile lamprey and 15 Siberian prawns (all mortalities) were recovered.

Avian Activity: There were low to moderate numbers of piscivorous birds counted around the project (see the table below). Most of the pelicans were observed foraging in the spillway and powerhouse tailrace zones. Contracted land-based hazing of piscivorous birds for 8 hours per day is occurring. The land-based hazing has been effective at moving birds out of zones adjacent to the dam. .

Daily maximum piscivorous bird counts at Ice Harbor Dam.

Date	Gulls	Cormorants	Caspian Terns	Grebes	Pelicans
June 14	0	0	0	0	10
June 15	0	1	0	0	10
June 16	2	3	0	0	23
June 17	0	1	0	0	18
June 18	19	4	0	0	16
June 19	8	3	0	0	29
June 20	0	2	0	0	26

Invasive Species: No new exotic species have been found.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by PSMFC and Anchor, frozen and properly disposed of in a landfill. Daily and total Siberian prawn counts at Ice Harbor Dam for this reporting period are shown below.

Date	Sample (euthanized)	Collection*
June 17	1	1
June 20	0	0
Totals	1	1

*Collection and sample numbers are the same for the facility when sampling at 100%

Fish Rescue/Salvage: None.

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

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: June 14 - 20, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
X		All 6 turbine units available for service (see table & comments below for details).	**Hard**	**Soft**
X		Available turbines operated within 1% peak efficiency? Constraint in effect.	X	

Lower Monumental Unit Outages (OOS) and Return to Service (RTS)

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
Unit 1	5/28/2019	06:58	7/12/2019	ERTS	Digital Governor Installation
Unit 2	6/14/2019	06:49	6/14/2019	10:30	Fish guidance efficiency study head gate change
Unit 2	6/19/2019	07:05	6/19/2019	10:15	Track Rack cleaning
Unit 3	6/14/2019	06:50	6/14/2019	10:30	Fish guidance efficiency study head gate change
Unit 3	6/18/2019	06:59	6/18/2019	15:55	Track Rack cleaning
Unit 3	6/19/2019	07:00	6/19/2019	08:45	Track Rack cleaning
Unit 4	6/17/2019	14:41	6/17/2019	15:35	Track Rack cleaning
Unit 4	6/18/2019	06:50	6/18/2019	14:42	Track Rack cleaning
Unit 5	6/17/2019	12:15	6/17/2019	15:45	Track Rack cleaning
Unit 6	6/17/2019	07:10	6/17/2019	13:30	Track Rack cleaning

Comments: Units went into Hard Restraint at 0001 on April 1.

Adult Fish Passage Facility

The adult fishways were inspected by Corps and Anchor QEA biologists on June 14, 15, 16 and 19.

Fish Ladder:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head $\leq$ 0.5’	
X		North Ladder Picketed Lead Differential	Head $\leq$ 0.4’	
X		North Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
X		South Ladder Exit Differential	Head $\leq$ 0.5’	
X		South Ladder Picketed Lead Differential	Head $\leq$ 0.3’	
X		South Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	

Comments: An adult unclipped Chinook mortality was found on the North Ladder walkway at the switchback, elevation 528 feet, on the June 16 inspection. It appeared the fish had jumped out of the ladder and over the handrail. This is not a location where mortalities have been found in the past, therefore anti-jump netting is not installed in this area. The area will remain closely monitored and necessary changes will be made if additional mortality occurs.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Shore Entrance (NSE-1) Weir Depth	≥ 8.0' or on sill	
	X		North Shore Entrance (NSE-2) Weir Depth	≥ 8.0' or on sill	
X			North Shore Channel/Tailwater Differential	1.0'–2.0'	
X		X	South Powerhouse Entrance (SPE-1) Weir Depth	≥ 8.0' or on sill	
X		X	South Powerhouse Entrance (SPE-2) Weir Depth	≥ 8.0' or on sill	
X			South Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	
X		X	South Shore Entrance (SSE-1) Weir Depth	≥ 8.0'	
X			South Shore Entrance (SSE-2) Weir Depth	≥ 6.0'	
	X		South Shore Channel/Tailwater Differential	1.0' – 2.0'	

Comments: North Shore Entrance weir entrance (NSE-2) was out of criteria on the June 19 inspection with a reading of 5.4 feet. Powerhouse operator was informed and the system was adjusted.
South Powerhouse Entrance weir (SPE-1) was on sill during the June 15, 16 and 19 inspections with readings of 8.0, 7.6 and 6.7 feet respectively.
South Powerhouse Entrance weir (SPE-2) was on sill during the June 15, 16 and 19 inspections with readings of 8.0, 7.6 and 6.7 feet respectively
South Shore Entrance weir (SSE-1) was on sill during the June 16 and 19 inspections with readings of 7.0 and 7.1 feet respectively.
South Shore Channel/Tailwater Differential was out of criteria during the June 19 inspection with a reading of 0.7 feet. Powerhouse operator was informed and the system was adjusted.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
X			AWS Fish Pump 1
X			AWS Fish Pump 2
X			AWS Fish Pump 3

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	140 yd²
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 – 50%
	X		Any oil seen in gatewells?	

Comments: Gatewells have been being dipped for debris removal on Fridays and Trash Racks for units 2, 3, 4, 5 and 6 were cleaned June 17 – 19.

STSs/VBSs:

Yes	No	NA	Item
X			STSs deployed in all slots and in service?
X			STSs in continuous-run mode (Note: if not, then STSs are in cycle-run mode)?
	X		STSs inspected this week?
		X	STSs inspection results acceptable?
		X	VBSs differentials checked this week?
		X	VBSs differentials acceptable?

Comments: STS's were operating in cycle mode until 1500 on May 16 when they were changed to continuous-run mode due to average sub-yearling Chinook and sockeye lengths being less than 120 mm. STS's were inspected June 4 – 6 with all screens found in good operating condition.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	19
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Collection Facility: Collection into raceways for transport began at 1500 on April 23.

Transport Summary: Due to low fish numbers, every-day barge transport ended with the May 15 barge and alternate day barging began. A total of 8,220 fish were collected with 10,363 fish being transported and 10 fish bypassed back to the river during this reporting period. Bypassed fish numbers for this reporting period were projected from salmonid fry in the sample.

Spillway Weir: Spring spill began and the RSW went into service at 0001 on April 3.

River Conditions

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
85.6	64.8	42.6	40.4	60.9	60.0	3.9	3.3

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on June 11. Live fish included 2 juvenile lamprey. Mortalities included 10 juvenile lamprey and 9 juvenile salmon.

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
6/14/2019	1111	15	0	0	0	2
6/15/2019	1200	7	0	0	0	1
6/16/2019	1130	9	0	0	0	3
6/17/2019	1111	7	0	0	0	1
6/18/2019	1130	5	0	0	0	0
6/19/2019	1200	12	0	0	0	0
6/20/2019	1100	12	0	0	0	6

Comments: Bird hazing efforts by USDA personnel ended at the end of the working day on June 2.

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

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by PSMFC and Anchor, frozen and properly disposed of in a landfill. Daily and total Siberian prawn counts at Lower Monumental Dam for this reporting period are reported below.

Date	Sample (euthanized)	Collection*
6/14/2019	0	0
6/15/2019	0	0
6/16/2019	3	30
6/17/2019	0	0
6/18/2019	0	0
6/19/2019	2	10
6/20/2019	1	5
Totals	6	45

*Collection and sample numbers are the same as the facility when sampling at 100%

Fish Rescue/Salvage: No Fish Rescue/Salvage took place during this reporting period.

Research: PNNL is continuing to collect data from units 2 and 3 for the Fish Guidance Efficiency.

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: June 14 – June 20, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	Hard	Soft
X		Available turbines operated within 1% peak efficiency? Constraint in effect.	X	

Little Goose Unit Outages (OOS) and Return to Service (RTS)

	OOS		RTS		
Unit	Date	Time	Date	Time	Outage Description
5	04/21/17	00:54	03/31/21	17:00	Spider and Upper Guide Bearing Repair
1	06/17/19	15:20			Header air valve broken
6	06/18/19	07:35	06/18/19	16:07	Switching station power caused unit to trip.

Comments: None.

Adult Fish Passage Facility

Little Goose fish facility, Anchor QEA and/or Oregon Department of Fish and Wildlife staff inspected the adult fishway on June 16, 19 and 20.

Fish Ladder:

Yes	No	NA	Location	Criteria	Measurements
X			Fish Ladder Exit Differential	Head $\leq$ 0.5’	
X			Fish Ladder Picketed Lead Differential	Head $\leq$ 0.3’	
X			Fish Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
X			Fish Ladder Cooling Water Pump in Service		
X			Fish Ladder Exit Cooling Water Pump Operating Satisfactorily		

Comments: The adult ladder cooling pump began operating on June 12 at 07:22.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurement
X			South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0’	
X			South Shore Entrance (SSE-2) Weir Depth	$\geq$ 8.0’	
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	$\geq$ 7.0’ or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	$\geq$ 7.0’ or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
	X		North Shore Entrance (NSE-1) Weir Depth	$\geq$ 6.0’ or on sill	5.4
	X		North Shore Entrance (NSE-2) Weir Depth	$\geq$ 6.0’ or on sill	5.5
X			North Shore Channel/Tailwater Differential	1.0’–2.0’	
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	1.1, 0.6

Comments: The adult Fishway continues to operate in manual mode. Project staff have struggled to maintain entrance criteria during spring spill. The June 20 inspection found the Northshore weirs at 5.4 and 5.5 respectively. The June 19 and 20 inspection found the collection channel surface velocity at 1.1 and 0.6 fps, respectively.

Subsurface water velocity was measured near NPE on June 03 using a Rickly velocity meter and averaged 4.2 feet per second.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
X			AWS Fish Pump 1
X			AWS Fish Pump 2
X			AWS Fish Pump 3

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comment
X			Forebay debris load acceptable? (amount)	
X			Trash rack differentials measured this week?	
X			Trash rack differentials acceptable	
		X	Any debris seen in gatewells (% coverage)	
		X	Any oil seen in gatewells?	

Comments: Trash rack differentials for Units 2, 3 and 4 were measured on June 20 and were in criteria. There is approximately 300 square feet of floating woody debris inside the trash shear boom in the immediate forebay.

ESBS/VBS:

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
	X		ESBSs inspected this week?
		X	ESBSs inspection results acceptable?
X			VBSs differentials checked this week?
X			VBSs differentials acceptable?

Comments: ESBS's were manually operated on June 11 and operated satisfactorily. VBS differentials for Units 2, 3 and 4 were measured on June 20 and were in criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	22
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Collection Facility: The juvenile bypass system is currently operating in criteria. Daily collection for condition sampling began on April 23 at 07:00. Every day barge transport ended on May 15 and the first every other day barge departed on May 17.

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 13,345 fish were collected, of which 16,008 were transported via barge which includes fish collected on June 13.

The descaling and mortality rates were 1.1% and 0.17% respectively. There were 3 adult lamprey removed from the separator, raceways, and sample and released one mile above the Dam at Little Goose Landing.

Spillway Weir: The adjustable spillway weir was operated in accordance to the most recent Columbia Basin Teletype (CBT) for adult passage during this report period. Summer spill operation commenced on June 21.

River Conditions

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
83.6	67.5	42.9	41.2	64.4	64.2	3.7	3.0

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers are currently being inspected every other week and results are sent to district for FPOM distribution.

Avian Activity: Daily Piscivorous bird counts at Little Goose Dam will started on April 01.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
6-14	1230	1	2	0	3
6-15	1100	0	2	0	0
6-16	830	0	2	0	0
6-17	1120	1	5	0	0
6-18	1150	0	2	0	5
6-19	1200	0	0	0	0
6-20	1200	0	0	0	1

Invasive Species: No zebra or Quagga mussels were observed.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by ODFW and Anchor, frozen and properly disposed of in a landfill. Daily and total Siberian prawn counts for this reporting period are reported below.

Date	Sample	Collection*
6-14	0	0
6-15	3	30
6-16	1	10
6-17	5	50
6-18	7	56
6-19	14	70
6-20	15	75
Totals	45	291

*Collection and sample numbers are the same as the facility when sampling at 100%

Gas Bubble Trauma (GBT): Gas bubble monitoring occurred on June 15. Personnel examined 100 fish of which there were no signs of GBT.

Fish Rescue/Salvage: N/A

Research: N/A

Project: Lower Granite
Biologists: Elizabeth Holdren
Dates: June 14-20, 2019

Turbine Operation

Yes	No	Turbine Unit Status		
	X	All 6 turbine units available for service (see table & comments below for details).	Hard	Soft
X		Available turbines operated within 1% peak efficiency? Constraint in effect.	X	

Lower Granite Unit Outages (OOS) and Return to Service (RTS)

	OOS		RTS		
Unit	Date	Time	Date	Time	Outage Description

Comments: No units were out of service for this reporting period.

Adult Fish Passage Facility

Lower Granite Corps biologist's and Anchor Environmental biologist's inspected the adult fish ladder June 14, 15, 18, and 19.

Fish Ladder:

Yes	No	NA	Location	Criteria	Comments
X			Fish Ladder Exit Differential	Head $\leq$ 0.5'	
X			Fish Ladder Picketed Lead Differential	Head $\leq$ 0.3'	
X			Fish Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	
X			Fish Ladder Cooling Water Pumps in Service		
X			Fish Ladder Cooling Water Pumps Operating Satisfactorily		

Comments: Fish ladder temperature control pumps were brought on line at 1125 hours June 14.

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
X			South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0'	
	X		South Shore Entrance (SSE-2) Weir Depth	$\geq$ 8.0'	7.9'
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	
X			North Powerhouse Entrance (NPE-1) Weir Depth	$\geq$ 8.0' or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	$\geq$ 8.0' or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	
X			North Shore Entrance (NSE-1) Weir Depth	$\geq$ 7.0' or on sill	
			North Shore Entrance (NSE-2) Weir Depth	$\geq$ 7.0' or on sill	Closed
	X		North Shore Channel/Tailwater Differential	1.0'–2.0'	2.1'
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	

Comments: Since May 4 the fish ladder control system screen and local reading for the south shore channel/tailwater and depth over the SSEs have been inconsistent. The problem has been reported to electricians and operations and the Project is waiting for engineering support. District hydraulic and electrical engineers were are looking into the fish ladder issues. SSE gates remain in local operation.

Current spill and powerhouse operations result in variable tailwater elevations at fish ladder entrances. Tailwater conditions may be impacting the fish ladder control systems ability to maintain criteria particularly at the NSE channel/tailwater head differentials.

NPE channel velocity sensor has consistently read 1.1 fps this report week. Surface velocity was verified using tape measurer and stopwatch and was 1.7 fps. Surface velocities will be used until the fish ladder control system NPE velocity issues are resolved.

Auxiliary Water Supply System:

Operating Satisfactorily	Standby	Out of Service	Auxiliary Water Supply (AWS)
X			AWS Fish Pump 1
	X		AWS Fish Pump 2
X			AWS Fish Pump 3

Comments: AWS pump 1 experienced an overload trip at 0120 hours June 19 while operating in fast speed. Pump 1 was restarted in slow speed at 0214 hours June 19. A delay of about 1 hour is required between starting and stopping the pump for operational reasons.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Average of ~ 24.8 yds^2
X			Trash rack differentials measured this week?	
X			Trash rack differentials acceptable	
X			Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: None.

ESBSs/VBSs:

Yes	No	NA	Item
X			ESBSs deployed in all slots and in service?
	X		ESBSs inspected this week?
		X	ESBSs inspection results acceptable?
X			VBSs differentials checked this week?
X			VBSs differentials acceptable?

Comments: None.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	18+
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: The collection channel is operating with all 14" orifices open. Additional 10" orifices are used to maintain optimal flume flow. The north makeup water valve remains in local control due to an automatic control motor hardware failure and was manually closed June 17 due to increased forebay elevation. Orifices in unit 3

gatewell slots were indicating they were closed on the HMI screen. The orifice gates were not able to operate in local or with the HMI. The solenoids on all three 14" orifices were hot indicating an issue at the valve.

Collection Facility: The facility is in collection for transport and condition sampling mode.

Transport Summary: Every-other-day barge transport continues.

Spillway Weir: Spring flex spill operation continues.

River Conditions

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
86.6	67.4	41.9	40.3	63.0	60.2	5.0+	4.4

*Cooling water intake temperature.

Other

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

Invasive Species: There were 30 Siberian prawns collected in the sample this week. Of these, 16 were euthanized and 14 were mortalities.

Avian Activity: Biologist daily piscivorous bird counts at Lower Granite Dam are listed below.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
14-Jun	1030	1	0	0	13
15-Jun	1152	0	0	0	3
16-Jun	1738	1	0	0	17
17-Jun	1956	0	0	0	20
18-Jun	1100	0	0	0	7
19-Jun	1324	1	0	0	25
20-Jun	1425	0	0	0	14

Gas Bubble Trauma **(**GBT**)** Monitoring: GBT sampling has ended for this season.

Adult Fish Trap Operations: The adult trap is operating Monday-Friday at a 28% sample rate.

Fish Rescue/Salvage: No fish salvages were conducted this reporting period.

Research:

Idaho Fish and Game (IDFG) Genetic Stock Identification

Fish collected as part of the Lower Granite juvenile condition sample are used to enumerate and characterize age composition and genetic stock profiles of naturally producing yearling chinook and juvenile steelhead. IDFG will sample Monday through Friday through mid-June with a goal of collecting 2,000-5,000 yearling chinook and juvenile steelhead genetic samples.

Nez Perce Tribe (NPT)/U. of Idaho (UI)/Columbia River Intertribal Fisheries Commission (CRITFC) – Kelt Study

This research 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 and later release 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 2018 in natal streams and are diverted to the Sort-By-Code tanks at LGR. Collection and tagging for this study ended June 14.

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 LWG tailrace. Collection and tagging for this study ended June 14.

National Marine Fisheries Service (NMFS) Seasonal Effects of Transporting Fish from the Snake River to Optimize Transportation Strategy:

This study aims to build on the current database of information on the seasonality of smolt-to-adult return rates (SARs). LWG biological staff began collection for the early non-transport season Monday April 1. Fish are being collected Monday and Tuesday for tagging on Tuesday and Wednesday with the barge departing LWG on Thursdays. Collection will occur Sunday-Thursday with fish being tagged Monday-Friday once general every day fish transport begins. Collection and tagging for this study ended June 14.

National Marine Fisheries Service (NMFS) PIT tagging of Adult Wild Chinook and Adult Steelhead for ISEMP-Related Dispersal Monitoring:

The goal of this project is to PIT tag up to 4000 unclipped adult Chinook and 4000 unclipped adult steelhead collected in the adult trap daily sample for dispersal monitoring.

National Marine Fisheries Service (NMFS) Ancillary Adult Passage Monitoring:

Fish that were PIT as juveniles at LWG are monitored as returning adults through the river and LWG facility. For each returning adult the following is estimated; 1) passage time between sets of detection PIT tag coils, 2) whether the fish was handled at the adult trap, 3) duration the fish was held at the adult trap, 4) overall passage time from ladder entrance to exit, 5) whether the turnpool gate was open or closed during passage. This will be the last year of this evaluation.

Sampling of Steelhead, Chinook salmon, and Sockeye salmon by the Idaho Department of Fish and Game (IDFG) and NOAA Fisheries for Biological data collection.

Upriver migrating steelhead, spring/summer Chinook salmon, and sockeye salmon are collected from the adult trap beginning April 4 through December 15. The goal is to collect 5-20% of adult steelhead, spring/summer Chinook salmon, and sockeye salmon ascending the ladder April 4-December 15. Data collection includes fish scales, genetics tissue, sex and length, wild/hatchery composition, and non-adipose clipped hatchery fish assessment. All natural origin adult steelhead and spring/summer Chinook salmon trapped will be PIT tagged to estimate headwater tributary escapement. Sockeye salmon may be PIT tagged in the future to estimate metrics regarding conversion rates. Some steelhead and spring/summer Chinook salmon may be radio-tagged or spaghetti-tagged. This information on adult fish forms the basis for status information used in several forums including BiOp-RPA identified needs.

PIT Tagging and Genetic Sample Collection from Bull Trout for USFWS:

Bull trout will be collected as part of the normal adult trap daily sample and using the adult SbyC system to recapture previously PIT tagged fish. Untagged bull trout will be PIT tagged, fin clipped for genetic analysis, and have morphometric data collected including weight and length etc. Fin clips will be sent to USFWS to determine the fish's origin. Previously PIT tagged bull trout will only have morphometric data collected. All fish will be released back into the adult fish ladder.

Juvenile Fish Scale Patterns University of Washington and NOAA Fisheries:

This study is a collaborative effort to determine a non-lethal index of biological condition to relate to survival across life stages of spring/summer Chinook salmon. The objectives are to test for relationships between fish length, growth, and conditions experienced to fish scale patterns. Sample collection will occur April 17, May 8, and May 29. A target of 120 individual scale samples from spring/summer Chinook salmon collected at LWG for NOAA Fisheries survival studies listed above. Samples collected at Lower Granite Dam included 101 on April 17, 120 on May 8, and a maximum 120 on May 29. Collection and tagging for this study ended May 29.