U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#12-2019

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: May 17 to 23, 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**
14	05/21	0743	05/21	0804	Trash rack cleaning.
3	05/21	0806	05/21	0834	Trash rack cleaning.
2	05/21	0837	05/21	0852	Trash rack cleaning.
1	05/21	0950	05/21	1129	Trash rack cleaning.
7	05/21	1010	05/21	1035	ESBS camera inspections.
8	05/21	1037	05/21	1107	ESBS camera inspections.
9	05/21	1108	05/21	1128	ESBS camera inspections.
5	05/22	0700	05/22	1616	Hub tapped.
5	05/23	0943	06/07	NA	Excessive water in hub.

Comments: There is nothing to report.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on May 17, 19 and 21. Adult fish counting continued. Video review of night time lamprey passage will begin 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’	0.6’ on May 17

Comments: Debris loads were minimal to light near both exits with picketed leads being cleaned as required, including weekends. The general maintenance staff was called in to clean the leads on May 17, which addressed the Washington shore exit out of criterion point mentioned above.

At the Oregon shore ladder exit, the regulating weir tripped an alarm was reset on May 19 and 21. Exit weir 335 tripped an alarm and was reset on May 19. Since water clarity improved, the count station back board was moved out on May 20.

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'	7.9' on May 21
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: The Oregon shore north powerhouse entrance out of criterion point listed above may have been due to calibration drifts. Due to budget constraints, floating orifice gate replacement will need to be rescheduled.

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
X			Oregon shore Fish Pump 2, Blade angle: 24°
X			Oregon shore Fish Pump 3, Blade angle: 24 to 26°
X			OR North Powerhouse Pool supply from juvenile fishway

Comments: Due to budget constraints, fish pump 1 is now scheduled to return to service in October.

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. Water temperature monitoring throughout the juvenile passage facility will begin on June 1.

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 to light. There was minimal debris at the spillway. Some of the powerhouse debris moved to the Oregon shoreline due to northeast winds. The debris load there would be described as light.

Trash racks were cleaned in unit 1, 2A, 3A and 14A slots on May 21. There were 10 yards of debris removed. No fish were observed in the debris. Large sticks were removed from the gatewell slots as needed.

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: ESBSs are installed in all units. The brush cycles for the screens in 6A, 8A, 8C, 10A and 13A slots remained in timer mode. The brush cycles for the screens in 8A, 8C and 10A slots were reset after alarms were tripped on May 21, 22 and 17, respectively. The brush cycles for the screens in 10B and 10C slots tripped multiple alarms and were switched to timer mode on May 20. After tripping an alarm, the brush cycle for the screen in 10C slot was reset on May 22. Camera inspections in units 7, 8 and 9 revealed no problems on May 21.

Daily VBS differential monitoring continued. No high differentials were recorded. The VBSs in 1C and 6C slots along with VBSs in units 2 and 3 were inspected on May 20. The VBSs in units 5, 6 and 7 were inspected on May 23. Inspections include cleaning. No problems were found and NO fish were observed. All VBSs have been cleaned or inspected this season.

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: Orifice valve operator rehabilitation continued. Orifices were adjusted as required for VBS cleaning, inspections and trash rack cleaning as required. There are no problems to report.

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. This week, 2,200 juvenile lamprey and 114,800 smolts were bypassed during secondary bypass.

A piece of rope was removed from the sample return to river line just downstream of the flume drier on May 20. Fish released from the sample cannot be observed downstream of this location. There is no theory on how the rope got there.

TSW Operations: The two TSWs remained part of the spill pattern. An MOC (19 MCN 08 MOC) was sent to FPOM for coordination due to June 8 being a Saturday, requesting the TSWs removal be delayed until June 10.

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
354.7	289.7	197.0	172.9	54.5	53.9	6.0	4.0

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. The summer spill program will begin on June 16.

This week, at spillbay 1, the hoist pillow block was braced. The hoist was returned to service on May 22 at 1548 hours.

Other

Inline Cooling Water Strainers: The next cooling water strainer examinations will occur on June 4.

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

There was very little activity in the powerhouse zone. In the spill zone, gull numbers fluctuated and only a few pelicans or cormorants were observed. The gulls did appear to be feeding.

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

Date	Zone	Gull	Cormorant	Tern	Pelican
May 17	Spill	30	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 18	Spill	10	0	0	0
	Powerhouse	0	0	0	0
	Outfall	10	0	0	0
May 19	Spill	47	0	0	1
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 20	Spill	8	0	0	1
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 21	Spill	44	2	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 22	Spill	35	0	0	1
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 23	Spill	25	0	0	4
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0

In the bypass outfall zone, most of the gulls were roosting on the full flow pipe. No other birds were observed. Due to the roosting, which was previously discouraged by bird wire, the outfall numbers may appear inflated compared to previous years. However, USDA Wildlife Services boat hazing greatly reduced the number of gulls roosting during the observations.

The laser being used to "haze" the outfall was on during all outfall observations. The laser patterns are programmed on at 0500 to 0800, 1030 to 1330 and 1500 to 2000 hours. Though observations are limited, the laser does appear to displace the birds that are within its range. Most of the gulls noted roosting on the outfall pipe were outside the laser's range and in the section with no bird wire. When comparing the laser effectiveness using past bird counts, feeding birds will have to be considered.

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 was deployed at the end of the remaining outfall pipe walkway on May 22. USDA Wildlife Services continued working two shifts and boat hazing four days a week.

In the forebay zone, an occasional osprey, cormorant or gull along with grebes numbering from zero to 17 birds were observed. Fluctuating numbers of pelicans, cormorants and gulls were noted roosting outside the zone along the Washington shore line. Most birds appear to be staging at this time. No grebes were noted elsewhere.

Invasive Species: The next mussel station examinations will occur on May 26. So far this season, one Siberian prawn was removed from the sample and euthanized.

Fish Rescue/Salvage**:** None occurred.

Research: None is occurring at this time. The University of Idaho with return to project in the near future to resume the adult lamprey passage study. The Yakima Nation removed at total of 15 juvenile lamprey from the sample for an offsite passage study on May 21 and 23. Gas bubble trauma (GBT) examinations occurred twice during the week. One clipped steelhead smolt was observed with signs of GBT.

Project: Ice Harbor
Biologist: Ken Fone
Dates: May 17 – May 23, 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	---	---	Investigate for possible oil leak
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind
1	5/15/19	1446	5/23/19	1556	STS inspection, STS/VBS repair, unit relay problems

Comments: Unit 1 was out of service from May 15 to May 21 for STS/VBS inspections and repair. The unit remained out of service until May 23 because of problems with electronic relay settings for starting the unit.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on May 20, 21, and 22.

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	0.9, 0.9, 1.1 fps
	X		North Powerhouse Entrance (NFE-1) Weir Depth	≥ 8.0’ or on sill	7.4’, 7.9’
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’ – 2.0’	
X			North Shore Entrance (NEW-1) Weir Depth	≥ 8.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’ – 2.0’	

Comments: The south shore channel water velocity was below criteria on all three 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. On May 22, some of the diffuser valves just upstream of the junction pool were opened to about 25% open to try to increase the velocity. Velocity readings taken during and immediately after opening of the valves indicated a possible improvement, but readings were still below criteria. More readings

will be taken during upcoming fishway inspections to monitor the water velocity. The diffuser valves failed to operate electrically, so any changes to valve positions require turning of the hand wheels. These valves are not normally adjusted and had not been operated for many years.

The north powerhouse entrance weir depth was out of criteria on May 21 and 22, when the tailwater elevation decreased. The tailwater level increased after the fishway inspection on May 21, to bring the weir depth temporarily back into criteria. After the inspection on May 22, the powerhouse operator lowered NFE-1 by approximately 1' to bring the weir depth back into criteria. NFE-1 is in manual control to reduce the wear and tear on the operating machinery from the weir gate constantly adjusting to the fluctuating tailwater from spill.

Auxiliary Water Supply (AWS) System:

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

Comments: South shore AWS pump #8 has been out of service since March 1, due to the pump needing an oil change and heater installation.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	18 square yards
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0-3%
	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: Unit 6, 5, 2, and 1 STSs and unit 1 VBSs were inspected on May 14 and 15. On May 15, gatewell slot 1B STS was observed to have a tear in the mesh and was separating substantially at one of the seams. Slot 1A VBS was found to have numerous holes and tears in the mesh, including one tear measuring approximately 2' x 4', in the bottom panel of the VBS. No fish were seen inside the damaged STS and VBS. The damaged STS in slot 1B was replaced with a spare STS. In order to repair the VBS in slot 1A, 1A STS was first removed, debris was removed from the slot, fish were dipped out of the slot, the maintenance bulkhead was installed, and then the slot was unwatered. Two holes in the VBS mesh, measuring approximately 4" in diameter, were patched. The other tears were over a closed-in section of solid metal bracing, with no way for fish to get through into the head gate slot. With the approval of the Project Biologist, the torn mesh over the solid bracing was cut off for now, with a decision

to be made on whether the mesh will need to be replaced in the future. The maintenance bulkhead was removed and the STS was reinstalled on May 21.

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: Both lights for 1C orifices were found to be burned out on May 17 and were replaced that day.

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. The cause of the descaling observed on one of the fish in the May 20 sample and three of the fish in the May 23 sample was attributed to birds and fish.

Fish condition sampling results at Ice Harbor Dam:

Date: May 20

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	50	1	0	0
Chinook yearling unclipped	11	0	0	0
Chinook subyearling clipped	5	0	0	0
Chinook subyearling unclipped	5	0	0	0
Steelhead clipped	34	2	0	0
Steelhead unclipped	11	2	0	0
Coho clipped	1	0	0	0
Coho unclipped	1	0	0	0
Sockeye clipped	23	0	0	0
Sockeye unclipped	1	0	0	0
Total	142	5	0	0

Date: May 23

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	34	1	0	0
Chinook yearling unclipped	5	1	0	0
Chinook subyearling clipped	10	0	0	0
Chinook subyearling unclipped	7	0	0	0
Steelhead clipped	45	4	0	0
Steelhead unclipped	26	3	0	0
Coho clipped	0	---	---	---
Coho unclipped	6	0	0	0
Sockeye clipped	39	1	0	0
Sockeye unclipped	0	---	---	---
Total	172	10	0	0

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

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
162.4	121.3	121.0	82.3	56	53	4.8	4.4

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections for lamprey occurred on May 23. A total of 1 juvenile salmon, 2 juvenile lamprey, and approximately 100 Siberian prawns were found (all mortalities). The salmon could not be identified to species due to the state of decomposition.

Avian Activity: There were low to high numbers of piscivorous birds counted around the project (see the table below). Most of the pelicans were observed around Eagle Island. The high numbers of gulls and cormorants that were counted on some of those days occurred just before hazing began for the day or when boat-based hazing was not actively occurring. Contracted land-based hazing of piscivorous birds for 16 hours per day is occurring. Boat-based hazing for 8 hours per day, 5 days per week, is occurring. The land-based hazing has been effective at moving birds out of zones adjacent to the dam. Boat-based hazing has been effective at dispersing gulls and cormorants out of downstream spillway and powerhouse zones. Wildlife Specialists hazed a few cormorants periodically attempting to forage below the juvenile fish bypass outfall pipe.

Daily maximum piscivorous bird counts at Ice Harbor Dam.

Date	Gulls	Cormorants	Caspian Terns	Grebes	Pelicans
May 17	0	9	0	0	77
May 18	16	83	3	0	65
May 19	4	84	0	0	63
May 20	142	15	0	0	23
May 21	86	23	0	0	8
May 22	3	10	0	0	7
May 23	72	8	0	0	53

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. No Siberian prawns were collected in the sample during this reporting period.

Fish Rescue/Salvage: As mentioned in the STSs/VBSs Section above, removal of fish from gatewell slot 1A with the dip basket occurred on May 17. Approximately 30 smolts were removed from slot 1A and released into slot 1C in good condition.

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

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: May 17 - 23, 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	5/20/2019	09:00	5/20/2019	11:59	Trash Rack Cleaning
Unit 2	5/17/2019	06:55	5/17/2019	11:10	Fish guidance efficiency study head gate change
Unit 2	5/20/2019	09:00	5/20/2019	14:44	Trash Rack Cleaning
Unit 3	5/17/2019	06:56	5/17/2019	11:10	Fish guidance efficiency study head gate change
Unit 3	5/20/2019	12:06	5/20/2019	14:55	Trash Rack Cleaning
Unit 3	5/22/2019	08:54	5/22/2019	12:16	Trash Rack Cleaning
Unit 4	5/22/2019	08:55	5/22/2019	13:45	Trash Rack Cleaning
Unit 5	5/22/2019	12:22	5/22/2019	13:45	Trash 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 May 17, 18, 19 and 22.

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: None.

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			South Powerhouse Entrance (SPE-1) Weir Depth	≥ 8.0' or on sill	
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			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: None.

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)	291 yd^2
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 – 45%
	X		Any oil seen in gatewells?	

Comments: Gatewells have been being dipped for debris removal on Fridays.
Trash racks for Units 1, 2, 3, 4 and 5 were cleaned on May 20 and May 22.

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.

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: The PDW mechanical screen cleaner brush drive belt was found broken at 1200 on May 19 during the Anchor QEA daily inspection. The mechanical system was turned off at this time. The pneumatic screen cleaning system cycle was changed to every 10 minutes to make up for the brush being down. Repair of the mechanical system is waiting on a new drive belt. There is currently no estimated return to service date.

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 331,700 fish were collected with 377,532 fish being transported.

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
156.7	116.1	48.2	36.0	55.3	54.0	2.7	2.3

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on May 20. Live fish included 1 juvenile steelhead. Mortalities included 6 juvenile lamprey, 15 juvenile salmon and 2 juvenile steelhead.

Avian Activity: Tailrace counts of foraging piscivorous birds at Lower Monumental Dam.

Gulls were the predominant piscivorous bird species observed during fish ladder inspections this week.

Date	**Time**	**Gulls**	**Cormorants**	**Terns**	**Grebes**	**Pelicans**
5/17/2019	1145	4	0	0	0	0
5/18/2019	1200	5	0	0	0	0
5/19/2019	1120	0	0	0	0	0
5/20/2019	1300	8	0	0	0	0
5/21/2019	1330	7	0	0	0	0
5/22/2019	1130	9	0	0	0	0
5/23/2019	1100	15	1	0	0	1

Comments: Bird hazing efforts by USDA personnel began on April 1.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on May 4.

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. No Siberian prawns were collected in the sample for this reporting period.
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: May 17 – May 23, 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
2	05/23/19	18:31	05/23/19	18:42	High thyristor temp

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 May 19, 21 and 23.

Fish Ladder:

Yes	No	NA	Location	Criteria	Measurements
X			Fish Ladder Exit Differential	Head ≤ 0.5’	
X			Fish Ladder Picketed Lead Differential	Head ≤ 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 Exit Cooling Water Pumps Operating Satisfactorily		

Comments: None.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurement
X			South Shore Entrance (SSE-1) Weir Depth	≥ 8.0’	
X			South Shore Entrance (SSE-2) Weir Depth	≥ 8.0’	
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	≥ 7.0’ or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	≥ 7.0’ or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
X			North Shore Entrance (NSE-1) Weir Depth	≥ 6.0’ or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	≥ 6.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’–2.0’	
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	0.8

Comments: The adult fishway continues to operate in manual mode. Project staff have struggled to maintain entrance criteria during spring spill. The May 21 inspection found the surface velocity near SSE at 0.8 fps, however the surface velocity near NPE and NSE was 2.0 and 2.9 fps, respectively. Subsurface water velocity was measured near NPE on May 05 using a Rickly velocity meter and averaged 4.0 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 1, 2, 3, 4 and 6 were measured on May 23 and were in criteria. There is approximately 8,000 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: VBS differentials for Units 1, 2, 3, 4 and 6 were measured on May 23 and were in criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	21
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 286,704 fish were collected, of which 303,969 were transported via barge which includes fish collected on May 16. The descaling and mortality rates were 2.4% and 0.15% respectively. A total of 1 adult lamprey was removed from the separator, raceways, and sample and released one mile above the Dam at Little Goose Landing.

Spillway Weir: Spring spill commenced on April 03 with the ASW in the high crest position. The ASW was adjusted to the low crest elevation on April 09.

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
160.0	119.7	69.8	47.5	54.0	52.7	2.9	2.4

*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 started on April 01.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
5-17	0800	0	0	0	0
5-18	1300	17	0	0	0
5-19	0800	0	1	0	0
5-20	1030	0	1	0	0
5-21	0800	0	0	0	0
5-22	0815	0	0	0	0
5-23	0830	0	0	0	0

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 PSMFC and Anchor, frozen and properly disposed of in a landfill. Siberian prawns collected in the sample for this reporting period are provided below:

Date	Sample	Collection*
5-17	0	0
5-18	0	0
5-19	0	0
5-20	0	0
5-21	0	0
5-22	0	0
5-23	1	50
Totals	1	50

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

Gas Bubble Trauma (GBT): Gas bubble monitoring occurred on May 20. Personnel examined 100 fish of which 2 had signs of GBT.

Fish Rescue/Salvage: N/A

Research: N/A

Project: Lower Granite
Biologists: Elizabeth Holdren
Dates: May 17-23, 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	

Comments: Other than units that were rotated out of service for ESBS inspection May 19 and 20 no other outages occurred during this reporting period.

Adult Fish Passage Facility

Lower Granite Corps biologist's and Anchor Environmental biologist's inspected the adult fishways May 17, 18, 20, and 22.

Fish Ladder:

Yes	No	NA	Location	Criteria	Comments
X			Fish Ladder Exit Differential	Head ≤ 0.5'	
X			Fish Ladder Picketed Lead Differential	Head ≤ 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: None.

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
	X		South Shore Entrance (SSE-1) Weir Depth	≥ 8.0'	7.5', 7.6', 7.5', 7.0'
	X		South Shore Entrance (SSE-2) Weir Depth	≥ 8.0'	7.5', 7.6',7.6', 7.1'
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	≥ 8.0' or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	≥ 8.0' or on sill	
	X		North Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	0.8'
X			North Shore Entrance (NSE-1) Weir Depth	≥ 7.0' or on sill	
			North Shore Entrance (NSE-2) Weir Depth	≥ 7.0' or on sill	Closed
	X		North Shore Channel/Tailwater Differential	1.0'–2.0'	2.5', 2.2'
X			Collection Channel Surface Velocity	1.5 – 4.0 fps	

Comments: Current spill and powerhouse operations result in variable tailwater elevations at fish ladder entrances. A strong counter clockwise eddy that extends across the tailrace from the south shore to spillway 1 and extends down to the outfall pipe results in a wall where it converges with turbine unit discharge and spillway flow. These tailwater conditions may be impacting the fish ladder control systems ability to maintain criteria.
Since May 4 the fish ladder control system screen has indicated the channel/tailwater head differential was out of criteria and SSEs depth over the weir was in criteria. Local south shore readings taken during the inspections indicated channel/tailwater was in head differential criteria and depth over the SSEs was out of criteria. It is suspected fish ladder control system SSE sensor issues are resulting in these inconsistencies between local readings and the control system. A similar issue was observed with the SSE control system tailwater sensor from March 29 to May 29 in 2018. The problem has been reported to electricians and operations.

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 was changed to fast operation at 1551 hours May 20 in an effort to increase channel/tailwater differentials at SSEs while the ongoing operational issue is being investigated.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Average of ~ 229.0 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: ESBSs were inspected May 19 and 20. All screens passed inspection.

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 is in local control due to an automatic control motor hardware failure.

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 with the RSW in 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
164.4	123.2	56.9	40.0	52.0	50.5	3.5	2.2

*Cooling water intake temperature.

Other

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

Invasive Species: No Siberian prawns were collected or euthanized in the sample this week.

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

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
17-May	1524	1	0	0	0
18-May	1550	1	0	0	10
19-May	1505	6	1	0	0
20-May	1051	2	3	0	0
21-May	1345	0	0	0	4
22-May	1254	1	0	0	16
23-May	1414	0	1	0	9

Gas Bubble Trauma **(**GBT**)** Monitoring: No signs of GBT were observed this week.

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

Fish Rescue/Salvage: No fish salvage operations occurred during 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.

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.

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.

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.