U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#13-2019

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: May 24 to 30, 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	06/07	NA	Excessive water in hub/turbine blade seals.

Comments: There is nothing to report.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on May 24, 26 and 28. 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'	

Comments: Debris loads were very light to light near both exits with picketed leads being cleaned as required, including the weekend. There are no 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'	7.8' on May 24
	X		NFEW3 Weir Depth	≥ 8.0'	7.8 & 7.9' on May 24 & 26
X			South Oregon Entrance Head Differential	1.0' – 2.0'	
	X		SFEW1 Weir Depth	≥ 8.0'	7.9' on May 24
	X		SFEW2 Weir Depth	≥ 8.0'	7.9' on May 24
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 ladder entrances were out of criteria points listed above may have been due to calibration drifts. The biologist asked for a weir set point adjustments on May 26.

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.
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: There are no problems to report.

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 9. Daily temperature reporting will begin on June 15.

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. As weather and operations move the debris across the forebay, much of the debris has been passing over the TSWs.

Trash racks are scheduled to be cleaned on June 24.

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, 8C, 10A, 10B, 10C and13A slots remained in timer mode. The brush cycles for the screens in 13B and 13C slots tripped multiple alarms and were switched to timer mode on May 27. No camera inspections occurred this week.

Daily VBS differential monitoring continued. No high differentials were recorded and no screens were cleaned.

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: 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, 3,050 juvenile lamprey and 25,200 smolts were bypassed during secondary bypass.

TSW Operations: The two TSWs remained part of the spill pattern. Due to June 8 being a Saturday, the TSWs will be removed from service on 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
293.7	261.9	187.1	171.4	57.0	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. Due to issues with the control room program, flow data for May 28 was incomplete. The spring flex spill program continued. The summer spill program will begin on June 16. At which time, 57 percent of the flow will be spilled.

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 greatly and only a few pelicans or terns were observed. The gulls did appear to be feeding.

In the bypass outfall zone, most of the gulls were roosting on the full flow pipe. One pelican was observed. Due to the roosting, which was previously discouraged by bird wire, the outfall numbers may appear inflated compared to previous years. However, when present, USDA Wildlife Services boat hazing greatly reduced the number of gulls roosting.

The laser being used to haze the outfall was on during all outfall observations. 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.

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.

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

Date	Zone	Gull	Cormorant	Tern	Pelican
May 24	Spill	109	0	3	0
	Powerhouse	0	0	0	0
	Outfall	21	0	0	0
May 25	Spill	44	0	1	1
	Powerhouse	0	0	0	0
	Outfall	46	0	0	1
May 26	Spill	42	0	0	0
	Powerhouse	0	0	0	0
	Outfall	23	0	0	0
May 27	Spill	4	0	1	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 28	Spill	33	0	0	3
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 29	Spill	9	0	0	1
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
May 30	Spill	0	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0

In the forebay zone, an occasional osprey or gull along with grebes numbering from 9 to 30 birds were observed. A few pelicans, cormorants and gulls were noted roosting outside the zone along the Washington shore line.

This week, five grebes entered the gatewell slots. Three were removed. Two passed to the juvenile channel. One remains in the channel and one passed to the separator where it was removed.

Invasive Species: The mussel station examinations revealed no problems on May 26. So far this season, one Siberian prawn was removed from the sample and euthanized.

Fish Rescue/Salvage**:** Fish salvage operations occurred in unit 5 scrollcase and draft tube on May 29 and 30, respectively. No fish were observed.

Research: None is occurring at this time. The University of Idaho with return to project to resume the adult lamprey passage study on June 4. The Yakima Nation removed at total of 43 juvenile lamprey from the sample for an offsite passage study on May 25, 27 and 29. Gas bubble trauma (GBT) examinations occurred twice during the week. No signs of GBT were observed.

Project: Ice Harbor
Biologist: Ken Fone
Dates: May 24 – May 30, 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
2	5/28/19	1029	5/30/19	0805	Fix oil leak from wicket gate servo valve piping

Comments: None.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on May 27, 28, and 29.

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	0.7, 0.9, 0.9 fps
X			North Powerhouse Entrance (NFE-1) Weir Depth	≥ 8.0’ or on sill	
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, but the readings indicate that there has been no improvement. The water added by these diffusers comes up between the stationary weirs, so the velocity in the lower water column of the junction pool will probably not increase significantly by opening these valves any further.

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: 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)	30 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: 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.

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: Orifice 6AN light was found to be burned out on May 29. Orifice 6AS was opened in place of orifice 6AN on May 30, until the light can be replaced.

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 three of the fish in the May 27 sample and two of the fish in the May 30 sample was attributed to birds and fish.

Fish condition sampling results at Ice Harbor Dam:

Date: May 27

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	19	0	0	0
Chinook yearling unclipped	14	1	0	0
Chinook subyearling clipped	36	1	0	0
Chinook subyearling unclipped	26	0	0	0
Steelhead clipped	35	4	0	0
Steelhead unclipped	22	3	0	0
Sockeye clipped	5	0	0	0
Sockeye unclipped	2	0	0	0
Coho clipped	3	0	0	0
Coho unclipped	10	1	0	0
Total	162	10	0	0

Date: May 30

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	1	1	0	0
Chinook yearling unclipped	1	0	0	0
Chinook subyearling clipped	48	1	0	0
Chinook subyearling unclipped	54	2	0	0
Steelhead clipped	21	1	0	0
Steelhead unclipped	15	2	0	0
Sockeye clipped	2	0	0	0
Sockeye unclipped	0	---	---	---
Coho clipped	1	0	0	0
Coho unclipped	1	0	0	0
Total	144	7	0	0

Removable Spillway Weir (RSW): Voluntary spill with the RSW operating 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
131.9	115.7	88.1	79.9	59	58	6.1	4.6

*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 moderate numbers of piscivorous birds counted around the project (see the table below). Most of the pelicans were observed around Eagle Island. 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, changed to 3 days per

week on May 26. 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 and at the south shore fish ladder exit.

Daily maximum piscivorous bird counts at Ice Harbor Dam.

Date	Gulls	Cormorants	Caspian Terns	Grebes	Pelicans
May 24	1	19	0	0	46
May 25	0	12	0	0	38
May 26	0	22	0	0	27
May 27	3	26	0	0	45
May 28	0	9	0	0	21
May 29	0	14	0	0	16
May 30	13	3	0	0	33

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*
May 27	1	1
May 30	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: May 24 - 30, 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	5/24/2019	07:00	5/24/2019	11:04	Fish guidance efficiency study head gate change
Unit 3	5/24/2019	07:00	5/24/2019	11:04	Fish guidance efficiency study head gate change

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 24, 25, 26 and 29.

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	$\geq$ 8.0’ or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	$\geq$ 8.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’–2.0’	
X			South Powerhouse Entrance (SPE-1) Weir Depth	$\geq$ 8.0’ or on sill	
X			South Powerhouse Entrance (SPE-2) Weir Depth	$\geq$ 8.0’ or on sill	
X			South Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
X			South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0’	
X			South Shore Entrance (SSE-2) Weir Depth	$\geq$ 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)	238 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.

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. The belt was replaced and the mechanical brush returned to service at 1130 on May 30.

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 92,300 fish were collected with 71,806 fish being transported and 50 fish were 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
127.0	110.3	39.7	36.5	55.1	52.9	3.7	2.4

*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: Gulls were the predominant piscivorous bird species observed during fish ladder inspections this week during tailrace counts of foraging piscivorous birds at Lower Monumental Dam.

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
5/24/2019	1230	6	0	0	0	0
5/25/2019	1200	8	0	0	0	0
5/26/2019	1145	0	0	0	0	0
5/27/2019	1200	0	0	0	0	0
5/28/2019	1300	0	0	0	0	0
5/29/2019	1230	0	0	0	0	0
5/30/2019	1300	0	0	0	0	0

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. Daily and total Siberian prawn counts at Lower Monumental Dam for this reporting period are reported below.

Date	Sample (euthanized)	Collection*
5/24/2019	1	50
5/25/2019	0	0
5/26/2019	0	0
5/27/219	0	0
5/28/2019	1	25
5/29/2019	0	0
5/30/2019	0	0
Totals	2	75

*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: May 24 – May 30, 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

Comments: Spillway 7 was out of service from 20:05 on May 28 through 08:43 on May 29 due to a motor coupler disconnecting.

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 26, 28 and 30.

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	4.1

Comments: The adult fishway continues to operate in manual mode. Project staff have struggled to maintain entrance criteria during spring spill. The May 30 inspection found the surface velocity near NPE at 4.1 fps, however the surface velocity near SSE was 2.7. 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 30 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 30 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 72,457 fish were collected, of which 62,970 were transported via barge which includes fish collected on May 16. The descaling and mortality rates were 1.5% and 0.10% respectively. There were no adult lamprey 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
129.0	113.0	48.2	47.1	56.0	54.1	3.6	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 started on April 01.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
5-24	1200	0	0	0	0
5-25	0900	1	1	0	0
5-26	0830	0	2	0	0
5-27	0800	0	0	0	0
5-28	0830	0	0	0	0
5-29	1145	0	0	0	0
5-30	0800	0	0	0	0

Invasive Species: No zebra or Quagga mussels were observed.

Siberian Prawn: N/A

Date	Sample	Collection*
5-24	0	0
5-25	0	0
5-26	0	0
5-27	0	0
5-28	1	25
5-29	0	0
5-30	0	0
Totals	1	25

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

Gas Bubble Trauma (GBT): Gas bubble monitoring occurred on May 27. 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 24-30, 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 at Lower Granite where out of service during this reporting period.

Adult Fish Passage Facility

Lower Granite Corps biologist's and Anchor Environmental biologist's inspected the adult fishways May 24, 25, 29, and 30.

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: None.

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
	X		South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0'	7.3', 7.3', 7.5',7.6'
	X		South Shore Entrance (SSE-2) Weir Depth	$\geq$ 8.0'	7.3', 7.3',7.5', 7.6'
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'	2.3', 2.5', 2.3'
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 and the Project is waiting for engineering support.

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 ~ 173.6 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 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 with the RSW 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
133.0	117.9	47.7	40.0	54.0	52.0	4.5	3.5

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on May 30. No live fish were collected. Mortalities included 30 juvenile lamprey and 6 juvenile salmon.

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
24-May	1115	0	1	0	2
25-May	1230	0	0	0	2
26-May	1215	0	0	0	7
27-May	1515	0	0	0	15
28-May	1125	0	0	0	10
29-May	1354	2	1	0	14
30-May	1530	1	0	0	12

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 activities 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.

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.