U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#14-2019

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: May 31 to June 6, 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	06/30	NA	Turbine blade packing.

Comments: There are no problems to report.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on June 1, 2 and 4. 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 light near the Oregon exit and light to heavy near the Washington exit. Picketed leads were cleaned as required, including on Saturday. Schedule maintenance was performed on both count station window brushes on June 3. The Washington exit regulating weir tripped an alarm and was reset on June 1.

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 June 2
	X		NFEW3 Weir Depth	≥ 8.0'	7.9' on June 2
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 2.2 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 entrance was out of criteria points listed above may have been due to calibration drifts. The biologist asked for weir set point adjustments on June 2.

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: 24°
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 was one interruption in the schedule this week. The system was in primary bypass on June 1, from 0715 to 0725 hours, in order to examine the full flow flume adult flush line which had not opened. When going to secondary bypass, the valve should have automatically opened to add water to the full flow flume. The biologist had to manually open the valve. There have been no further issues with the valve, which we will continue to monitor. One sample was missed.

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 moderate.
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 light but steady. This debris accumulated along the spillway (from minimal to moderate) and powerhouse. The spillway debris was removed with an emergency spill on June 6, which will be described below. The powerhouse debris passed over the TSWs. Both areas concluded the week with very light debris loads. The navigation lock was used to move debris downstream on June 2.

Trash racks are scheduled to be cleaned on June 24. One large piece of woody material was removed from 4B slot.

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 camera inspections in units 4 through 6 revealed no problems on June 4. The units were in standby during the inspections. The brush cycle for the screen in 6A slot had to be reset to timer mode after the inspections.

Daily VBS differential monitoring continued. No high differentials were recorded. A total of six VBSs were cleaned on June 1 and 6. One juvenile lamprey 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. Scheduled maintenance was performed on the side dewatering screen brush on June 3. 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. During the incident on June 1 mentioned above, the sample gates were left on. 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 is also mentioned above. This week, 3,340 juvenile lamprey and 39,970 smolts were bypassed during secondary bypass.

TSW Operations: The two TSWs remained part of the spill pattern. 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
326.0	285.6	189.9	173.5	60.2	57.3	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. At which time, 57 percent of the flow will be spilled.

An emergency debris spill occurred on June 6, from 1108 to 1525 hours. The project staff used spillbays 9, 11, and 16 operated in split leaf mode, which expedited debris removal from these and adjacent bays. The bays used were each open for 20 to 30 minutes in a rotating fashion, which drew the debris to the split leaf bays and passed it to the tailwater. The spillway gates settings were verified after the operation.

Other

Inline Cooling Water Strainers: The cooling water strainer examinations occurred on June 4. One live juvenile lamprey, 41 juvenile lamprey mortalities and one nonclipped Chinook smolt mortality were removed. Most of the fish came from units 1 through 7.

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 terns were observed. The gulls appeared to be feeding.

In the bypass outfall zone, most of the gulls were roosting on the full flow pipe. 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 appears 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 31	Spill	7	0	0	1
	Powerhouse	0	0	0	0
	Outfall	2	0	0	0
June 1	Spill	20	0	0	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
June 2	Spill	22	0	0	1
	Powerhouse	0	0	0	0
	Outfall	26	0	0	0
June 3	Spill	37	0	0	4
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
June 4	Spill	41	0	0	5
	Powerhouse	0	0	0	0
	Outfall	4	0	0	0
June 5	Spill	26	0	0	5
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0
June 6	Spill	40	0	3	0
	Powerhouse	0	0	0	0
	Outfall	0	0	0	0

In the forebay zone, grebes numbering from zero to 45 birds were observed. The zero bird day was just after hazing. A few pelicans, cormorants and gulls were noted roosting outside the zone along the Washington shore line.

This week, seven grebes entered the gatewell slots. Five grebes were removed from the slots. Two birds passed to the juvenile channel and joined the grebe from last week. Two of these grebes in the channel past to the separator where they were removed. One grebe remained in the channel.

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

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

Research: The University of Idaho resumed the adult lamprey passage study on June 4. The Yakima Nation removed 21 juvenile lamprey from the sample for an offsite passage study on May 31. This was their last trip to McNary. Gas bubble trauma (GBT) examinations occurred twice. Two smolts were observed with signs of GBT.

Project: Ice Harbor
Biologist: Ken Fone
Dates: May 31 – June 6, 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: None.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on June 3, 4, and 5.

Fish Ladders:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head $\leq$ 0.3’	
X		North Ladder Picketed Lead Differential	Head $\leq$ 0.3’	
X		North Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
X		South Ladder Exit Differential	Head $\leq$ 0.3’	
X		South Ladder Picketed Lead Differential	Head $\leq$ 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	$\geq$ 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	0.5, 0.9, 0.8 fps
X			North Powerhouse Entrance (NFE-1) Weir Depth	$\geq$ 8.0’ or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’ – 2.0’	
X			North Shore Entrance (NEW-1) Weir Depth	$\geq$ 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.

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)	23 square yards
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
	X		Any debris seen in gatewells (% coverage)	
	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 was replaced on June 4.

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 June 3 sample and two of the fish in the June 6 sample was attributed to birds and lamprey.

On June 4, a small unclipped juvenile sockeye was found alive in the anesthetizing chamber of the sample tank, under the anesthetizing basket. Water leakage from the tank supply valve had been enough to keep the fish covered.

The fish was released into the bypass flume in good condition. The fish was presumed to have jumped or fallen out of the basket during the sampling process on June 3 and is counted as a sampled fish that was not examined.

Fish condition sampling results at Ice Harbor Dam:

Date: June 3

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	3	1	0	0
Chinook yearling unclipped	1	1	0	0
Chinook subyearling clipped	32	0	0	0
Chinook subyearling unclipped	73	1	0	0
Steelhead clipped	14	1	0	0
Steelhead unclipped	8	0	0	0
Sockeye clipped	1	0	0	0
Sockeye unclipped	1	---	0	---
Coho clipped	1	0	0	0
Coho unclipped	0	---	---	---
Total	134	4	0	0

Date: June 6

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	2	0	0	0
Chinook yearling unclipped	0	---	---	---
Chinook subyearling clipped	37	0	0	0
Chinook subyearling unclipped	62	0	0	0
Steelhead clipped	15	2	0	0
Steelhead unclipped	5	0	0	0
Sockeye clipped	0	---	---	---
Sockeye unclipped	1	0	0	0
Coho clipped	2	0	0	0
Coho unclipped	0	---	---	---
Total	124	2	0	0

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

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
152.1	135.8	97.0	87.2	58	57	6.7	6.1

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Monthly strainer inspections for juvenile lamprey will occur later in June.

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 is occurring for 8 hours per day, 3 days per week. 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.

Daily maximum piscivorous bird counts at Ice Harbor Dam.

Date	Gulls	Cormorants	Caspian Terns	Grebes	Pelicans
May 31	0	23	0	0	39
June 1	0	15	0	0	41
June 2	0	8	0	0	28
June 3	5	15	0	0	47
June 4	0	7	0	0	16
June 5	1	14	0	0	33
June 6	0	12	0	0	40

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 3	0	0
June 6	1	1
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 31 – June 6, 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	6/04/2016	10:42	6/04/2016	13:13	STS Inspections
Unit 3	6/04/2016	13:23	6/04/2016	16:40	STS Inspections
Unit 3	6/06/2019	11:40	6/06/2019	14:15	STS Inspections/Trash Rack Cleaning
Unit 4	6/06/2019	09:10	6/06/2019	11:34	STS Inspections/Trash Rack Cleaning
Unit 5	6/05/2019	08:57	6/05/2019	16:12	STS Inspection
Unit 6	6/05/2019	16:17	6/05/2019	18:30	STS Inspection

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 31, June 1, 2 and 5.

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)	813 yd²
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 – 30%
	X		Any oil seen in gatewells?	

Comments: Gatewells were dipped for debris removal on June 5.
Due to gatewell drawdowns approaching the criteria point of 1.0' difference from the bench mark measurements, trash racks for units 3 and 4 were cleaned on June 6.

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: Orifice 15 became blocked during gatewell debris dipping on June 5. Orifice 16 was opened until orifice 15 blockage was cleared on the same day.

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 105,750 fish were collected with 125,834 fish being transported and 75 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
147.1	131.6	63.1	43.3	61.0	57.1	3.7	2.7

*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.

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
5/31/2019	1100	0	0	0	0	0
6/1/2019	1130	0	0	0	0	0
6/2/2019	1230	0	0	0	0	0
6/3/2019	1122	6	0	0	0	1
6/4/2019	1100	0	0	0	0	0
6/5/2019	1100	0	0	0	0	1
6/6/2019	1200	5	0	0	0	0

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*
5/31/2019	0	0
6/01/2019	0	0
6/02/2019	0	0
6/03/2019	0	0
6/04/2019	0	0
6/05/2019	3	75
6/06/2019	1	25
Totals	4	100

*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 31 – June 06, 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	06/04/19	07:15	06/04/19	17:25	Thyristor high temp
3	06/05/19	16:16	06/05/19	17:03	Thyristor high 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 June 02, 04 and 06.

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 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	$\geq$ 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	
X			North Shore Entrance (NSE-2) Weir Depth	$\geq$ 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	

Comments: The adult fishway continues to operate in manual mode. Project staff have struggled to maintain entrance criteria during spring spill. 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 1, 2, 3, 4 and 6 were measured on June 06 and were in criteria. There is approximately 6,000 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 June 06 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 101,980 fish were collected, of which 111,273 were transported via barge which includes fish collected on May 30. The descaling and mortality rates were 1.9% and 0.12% respectively. There were 5 adult lamprey removed from the separator, raceways, or 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. The adjustable spillway weir was recalibrated on June 06 in order to comply with the most recent Columbia Basin Teletype (CBT) for adult passage (MFR 19 LGS 06).

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
148.4	132.9	63.7	49.2	59.2	58.3	3.5	2.5

*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
5-31	0800	0	0	0	0
6-1	0800	0	0	0	0
6-2	0800	2	6	0	1
6-3	0730	0	0	0	0
6-4	1150	0	0	0	0
6-5	1300	0	0	0	1
6-6	0730	0	1	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. Daily and total Siberian prawn counts at Little Goose Dam for this reporting period are reported below.

Date	Sample	Collection*
5-31	2	50
6-1	0	0
6-2	2	50
6-3	0	0
6-4	1	50
6-5	0	0
6-6	1	50
Totals	6	200

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

Gas Bubble Trauma (GBT): Gas bubble monitoring occurred on June 03. Personnel examined 100 fish of which 5 had signs of GBT.

Fish Rescue/Salvage: N/A

Research: N/A

Project: Lower Granite
Biologists: Elizabeth Holdren
Dates: May 31-June 6, 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: None.

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'	7.5', 7.5', 7.4',7.8'
	X		South Shore Entrance (SSE-2) Weir Depth	$\geq$ 8.0'	7.4', 7.5',7.3', 7.8'
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', 2.1'
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. District hydraulic and electrical engineers were on Project June 5 and are looking into the fish ladder issues. SSE gates were changed to local operation with operators making adjustments in weir depth as the tailwater elevation changes.

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 is in fast speed.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Average of ~ 74.3 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 operation with the RSW operating 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
154.9	139.6	48.6	41.2	57.5	55.5	4.1	3.5

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: 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
31-May	1330	6	0	0	6
1-Jun	1117	0	7	0	13
2-Jun	1540	5	4	0	10
3-Jun	1445	0	0	0	0
4-Jun	1442	0	0	0	0
5-Jun	1307	0	1	0	0
6-Jun	1805	1	0	0	1

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 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.