U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#30-2019

Project: McNary
Biologist: Bobby Johnson and Denise Griffith
Dates: September 20 to 26, 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	10/31	NA	Turbine blade packing.
13	06/10	0610	10/18	NA	Turbine bearing.
12	08/26	0711	10/18	NA	Annual and oil leaks.
14	08/19	1221	01/01/20	NA	Oil replacement and turbine bearing.
2 & 3	09/24	1000	09/24	1026	ESBS camera inspections, rotated through units.

Comments: All return to service dates are subject to change.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on September 20, 22 and 24. Video review of night time lamprey passage will concluded on September 30. Adult fish counting continues.

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 to moderate near the Oregon exit and minimal to very light near the Washington exit. Picketed leads were cleaned as required, including Friday and Saturday.

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 Sep 20 & 22
	X		NFEW3 Weir Depth	≥ 8.0'	7.8' & 7.9' on Sep 20 & 22
X			South Oregon Entrance Head Differential	1.0' – 2.0'	
X			SFEW1 Weir Depth	≥ 8.0'	
	X		SFEW2 Weir Depth	≥ 8.0'	7.9' on Sep 20
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 1.8 fps.
X			Washington Entrance Head Differential	1.0' – 2.0'	
X			WFE2 Weir Depth	≥ 8.0'	
X			WFE3 Weir Depth	≥ 8.0'	

Comments: The out of criteria points listed above were possibly due to calibration or set point drifts, control issues and/or low tailwater elevations.

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 December 31.
X			Oregon shore Fish Pump 2, Blade angle: 24 to 25°
X			Oregon shore Fish Pump 3, Blade angle: 26 to 28°
X			OR North Powerhouse Pool supply from juvenile fishway

Comments: Due to bus switching, fish pump 2 was out of service on September 24, from 1720 to 1727 hours.

Juvenile Fish Passage Facility

The sampling season consisting of alternating days of primary and secondary bypass continued. The schedule was not interrupted this week. The season will conclude on September 30, at 0700 hours.

The full flow flume adult flush line valve remains open. The valve will be repaired during the winter maintenance season.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Powerhouse forebay debris load acceptable?	Light 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 minimal. The spillway debris load would be described as minimal. Much of the debris moves between the powerhouse and the Oregon shoreline. The debris is a mix of aquatic vegetation and woody material. No trash racks were cleaned.

There are no problems to report. The algae blooms in units 5 and 13 appear to be dying off.

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 units 6, 8, 10 and 13 remained in timer mode. After the unit 10 outage last week, the brush cycles for the screens were returned to timer mode on September 20. It was noted the program was not communicating with the screens in unit 11 on September 23. The electrical staff resolved the issue immediately. The brush cycles for the screens in units 2 and 3 were found in manual mode and returned to automatic mode on September 25. Camera inspection protocols were reviewed. Also, that day, the brush cycles for the screens in unit 8 were found in automatic mode and were returned to timer mode. Camera inspections in units 2 and 3 revealed no problems on September 24.

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: The transition brush was examined by the electrical staff on September 23. No problems were found and the brush was returned to service in automatic mode. No further issues have occurred. At this time, the best theory for the brush stalling out previously is dirt and spider webs near the limit switches. Both side dewatering valves appear to be operating warmer than normal and will be monitored.

Bypass Facility:

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

Comments: The sample gates were operated only when in secondary bypass. The PIT tag system will remain out of service as there are no studies requiring its use.

This week, 50 juvenile lamprey and 70 smolts were bypassed during secondary bypass. Juvenile shad remained the predominant fish examined.

The leakage coming from the B side secondary bypass line mentioned last week as a possible blockage was determined to be due to excess add in water.

TSW Operations: The TSW in spillbay 19 remained closed for the season. The TSW in bay 20 will be operated per the adult steelhead top spillway weir (TSW) passage efficiency study plan.

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
81.1	68.8	3.2	0.0	67.7	66.3	6.0	6.0

Comments: The above data is supplied by Anchor, QEA except water clarity, which is provided by the control room. The spill recorded was due to the TSW adult passage study.

Other

Inline Cooling Water Strainers: The cooling water next strainer inspections will occur on December 3.

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

Gull activity fluctuated in the powerhouse zone with birds feeding and roosting. At times, gulls were noted feeding in large numbers but not when the count was occurring. An occasional cormorant or great blue heron was also observed. In the spill zone, gull and cormorant numbers again fluctuated. No pelicans or terns were noted. All birds were feeding or roosting. Feeding was especially high when the TSW was open. A large percentage of gulls and cormorants roosted on the navigation lock wing wall. Adult and juvenile birds were observed. Bird numbers appear to be fluctuating with their migration and the juvenile shad out migration.

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

Date	Zone	Gull	Cormorant	Tern	Pelican
Sep 20	Spill	114	14	0	0
	Powerhouse	2	0	0	0
	Outfall	25	46	0	0
Sep 21	Spill	111	1	0	0
	Powerhouse	19	0	0	0
	Outfall	10	33	0	0
Sep 22	Spill	205	10	0	0
	Powerhouse	5	0	0	0
	Outfall	13	15	0	0
Sep 23	Spill	317	29	0	0
	Powerhouse	2	0	0	0
	Outfall	24	18	0	0
Sep 24	Spill	416	40	0	0
	Powerhouse	1	0	0	0
	Outfall	5	13	0	0
Sep 25	Spill	144	14	0	0
	Powerhouse	35	0	0	0
	Outfall	9	21	0	0
Sep 26	Spill	189	52	0	0
	Powerhouse	14	1	0	0
	Outfall	11	17	0	0

In the bypass outfall zone, the gulls and cormorants were mostly roosting on the full flow pipe. However, at times, a fair number of these birds were noted feeding, especially during high west winds.

The laser for bypass outfall hazing remained in place and functional. The laser does seem to deter the birds in flight. However, birds roosting are more difficult to haze with the laser. It is suspected the laser is not covering the outfall zone completely. A second laser is on project and will be installed after the start of the new fiscal year. Avian

observations, which normally concluded on September 30, will continue into the fall so a comparison can be made between one verses two lasers.

The bird distress calls remained deployed along the navigation lock wing wall. Roosting on the wall has increased but this seems to correspond to the juvenile shad outmigration. A large bird distress call is also deployed at the end of the remaining outfall pipe walkway. Its effectiveness has also decreased. The calls will be removed soon.

In the forebay zone, an occasional gull, gull flock or cormorant was observed. The grebe distress remains deployed. No grebes were observed on project. Fluctuating numbers of cormorants and gulls were noted roosting outside the zone along the Washington shore line. Large gull flocks have been staging around the project.

Invasive Species: The mussel station examinations revealed no issues on September 22. This week, one Siberian prawns was removed from the sample and euthanized. The season total is 11 prawns.

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

Research: The University of Idaho continued the adult lamprey passage study, which is near conclusion. The adult steelhead top spillway weir (TSW) passage efficiency study continued. One of the cameras stationed near the TSW was replaced on September 25.

Project: Ice Harbor
Biologist: Ken Fone
Dates: September 20 – September 26, 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**
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind
6	8/14/19	0743	---	---	Annual maintenance and overhaul
2	9/23/19	0800	9/25/19	1623	Install fish release pipes on unit 2 STSs
1	9/25/19	1330	9/25/19	1716	STS inspection

Comments: None.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on September 23, 24, and 26.

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	
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-2) Weir Depth	≥ 8.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’ – 2.0’	

Comments: None.

Auxiliary Water Supply (AWS) System:

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

Comments: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Average of 10 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 2 and unit 1 STSs were inspected on September 24 and 25. There were no problems found.

Orifices, Collection Channel, Dewatering Structure, and Flume:

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

Comments: None.

Juvenile Fish Facility: The fish facility is operating in primary bypass.

Fish Sampling: Sampling has ended for the year.

Removable Spillway Weir (RSW): Voluntary spill for fish passage has ended for the year.

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
29.4	21.4	0.1	0	67	67	7.6	6.4

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Monthly strainer inspections for lamprey ended in June and will start again in December.

Avian Activity: There were low numbers of gulls and pelicans observed around the project.

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 Anchor, frozen and properly disposed of in a landfill. Sampling is done for the year.

Fish Rescue/Salvage: None.

Research: Blue Leaf is conducting research on the recently installed lamprey entrance structure at the south adult fish ladder (SFE2). Didson cameras are being used to observe adult lamprey movement and adult salmonid fish interactions with the lamprey entrance.

On October 24, PNNL began releasing sensor fish through unit 2 for the turbine environment characterization study.

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis
Dates: September 20 - 26, 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 2	7/15/2019	07:20	1/10/2020	ERTS	Annual Maintenance/Draft Tube Liner Repair
Unit 3	9/25/2019	07:41	9/25/2019	16:20	Stator Cooler Inspection
Unit 6	8/05/2019	12:20	11/01/2019	ERTS	6 Year maintenance

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 September 20, 21, 22 and 25.

Fish Ladder:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head ≤ 0.5’	
X		North Ladder Picketed Lead Differential	Head ≤ 0.4’	
X		North Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
X		South Ladder Exit Differential	Head ≤ 0.5’	
X		South Ladder Picketed Lead Differential	Head ≤ 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		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: South Powerhouse Entrance weir (SPE-1) was on sill during all inspections with readings of 6.7, 7.1, 7.2 and 6.2 feet, respectively.
South Powerhouse Entrance weir (SPE-2) was on sill during all inspections with readings of 6.7, 7.1, 7.2 and 6.2 feet, respectively.
South Shore Entrance weir (SSE-1) was on sill during the September 20, 22 and 25 inspection with readings of 7.7, 8.0 and 7.2 feet respectively.

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)	3 yd^2
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 – 5 %
	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: STS's were operating in Cycle mode due to average sub-yearling Chinook and sockeye lengths being greater than 120 mm.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	17
	X		Dewaterer and cleaning systems operating satisfactory?	

Comments: None.

Collection Facility: Collection into raceways for transport began at 1500 on April 23. Loading fish into raceways for barge transport ended at 1500 on July 30. The facility went to 100% sample for truck transport at that time. The deck of the downstream coffer cell of barge dock was found collapsed on September 11. A void in the rock fill inside the coffer lead to the failure. Inspection of coffer cell by ROV on September 14 found a noticeable gap between the coffer wall and the river bed where the rock fill is coming out.

On September 26, an inundation of YOY American shad into the system obstructed the B side Sample Holding tank tail screen and the tank began to overflow. The facility was placed into primary bypass from 0500 to 0900. One unclipped juvenile Chinook was among the mortalities removed from the flume. The sample rate was

decreased from 100 to 10 percent when collection/sampling resumed at 0900 on September 26 with the facility in secondary bypass. The sample rate remained at 10 percent for the remainder of the reporting period. For more detailed information, see FPOM document 19 LMN 11 MFR.

Transport Summary: Every-other day barge transport ended with the July 30 barge. Every-other day truck transport began with the August 1 truck. A total of 55 fish were collected with 64 fish being bypassed during this reporting period (bypass numbers include fish collected Sept. 19th). Per 2019 Fish Passage Plan, the Lower Monumental trucking schedule is contingent upon fish numbers. Saturday, August 3 was the third consecutive day with less than 50 smolts collected; therefore trucking was ceased after the second trip. Bypassed fish numbers reflect the end of truck transport.

Spillway Weir: RSW went into service at 00:01:00 on April 3. The RSW was removed from service at 0630 on August 8 due to low river flows. Summer Spill ended at 00:00:00 on September 1.

River Conditions

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
28.3	24.6	0.0	0.0	67.0	66.8	5.4	3.4

*Scrollcase temperatures.

Other

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

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
9/20/2019	13:00	0	12	0	0	0
9/21/2019	12:00	5	39	0	0	0
9/22/2019	12:20	2	8	0	0	0
9/25/2019	11:00	2	0	0	0	0

Comments: Bird hazing efforts by USDA personnel ended at the end of the working day on June 2.
Daily bird hazing effectiveness tailrace observations ended with the June 30 observation.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on September 7.

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*
9/20/2019	10	10
9/21/2019	1	1
9/22/2019	3	3
9/23/2019	7	7
9/24/2019	7	7
9/25/2019	5	5
9/26/2019	13	13
Totals	46	46

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

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

Research: No Research took place during this reporting period.

Project: Little Goose
Biologists: Scott St. John and Richard Weis
Dates: Sept. 20-26, 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
3	09/09/19	07:29	10/14/19	17:00	Unit Annual

Comments: Unit 3 placed out of service on September 09 for unit annual.

Adult Fish Passage Facility

Little Goose fish facility, Anchor QEA and/or Oregon Department of Fish and Wildlife staff inspected the adult fishway on September 22 and 26.

Fish Ladder:

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

Comments: Cooling water pumps were shut off for the season on September 23.

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 spill. The equipment used to measure NSE weir depth was found out of service on the August 11 inspection. NSE weirs are at a depth greater than 7 foot. Subsurface water velocity was measured near NPE on September 21 using a Rickly velocity meter and averaged 2.5 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 differential for Units 1 and 2 was measured on September 19 and was in criteria. There is approximately 2,000 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 differential for Unit 1 and 2 was measured on September 19 and was in criteria.

Orifices, Collection Channel, Dewatering Structure, and Flume:

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

Comments: None.

Collection Facility: The juvenile bypass system is currently operating in criteria. Daily collection for condition sampling began on April 23 at 07:00. The last every other day barge departed on July 30 and every other day truck transport commenced on August 01.

Transport Summary: The collection and transportation facility operated within criteria this report period. A total of 130 fish were collected, of which 172 transported via truck (transport numbers include fish collected on Sept. 19th). The descaling and mortality rates were 0% and 2.8% respectively. There were 0 adult lamprey removed from the separator, raceways, and sample and released one mile above the Dam at Little Goose Landing.

Spillway Weir: The adjustable spillway weir (ASW) was closed on July 23 at 15:17 per the guidance outlined in the Columbia Basin Teletype (CBT). The ASW will remain closed for the season.

River Conditions

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
28.8	25.4	0	0	67.5	66.3	6.0	6.0

*Ladder temperature.

Other

Inline Cooling Water Strainers: Cooling water strainers were last inspected on July 3 with no lamprey being observed. Inspections will resume in December per the Fish Passage Plan.

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

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
9-20	1230	5	13	0	0
9-21	0900	12	6	0	0
9-22	1200	15	15	0	0
9-23	0915	23	6	0	0
9-24	1145	2	3	0	0
9-25	0850	16	8	0	0
9-26	1200	2	8	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 Oregon Department of Fish and Wildlife 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*
9-20	183	183
9-21	216	216
9-22	175	175
9-23	310	310
9-24	123	123
9-25	157	157
9-26	122	122
Totals	1,286	1,286

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

Gas Bubble Trauma (GBT): The last gas bubble monitoring occurred on July 15.

Fish Rescue/Salvage: None.

Research: N/A

Project: Lower Granite
Biologists: Elizabeth Holdren and Steve Lee
Dates: September 20 to September 26, 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
6	Sep 9	0700	Sep 26	1210	Annual Maintenance

Comments: None.

Adult Fish Passage Facility

Lower Granite Corps biologist's and Anchor Environmental biologist's inspected the adult fish ladder September 20, 21, 22 and 25.

Fish Ladder:

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

Comments: Fish ladder temperature control pumps were removed from service at 1700 September 25 in response to FPP adult ladder operation criteria.

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
	X		South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0'	7.8'
	X		South Shore Entrance (SSE-2) Weir Depth	$\geq$ 8.0'	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'	0.9'
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	1.4, 1.1

Comments: Since May 4 the fish ladder control system screen and local reading for the south shore channel/tailwater and depth over the SSEs have been inconsistent. SSE gates remain in local operation until Operation and District engineering can resolve the control system issues. LWG biologists are working with control operators to improve

gate depth and channel differential at NSE. September 25 NPE1, NPE2 were on sill and SSE1, SSE2 were out of criteria. On September 20 NSE1 differential was out of criteria.

NPE channel velocity sensor readings have consistently read below 1.5 fps for several weeks. Surface velocity is being verified using tape measure and stopwatch and found to be in criteria. Surface velocities and/or NSE velocities will be used until the fish ladder control system NPE velocity issues are resolved. Velocities have been reading below 1.5 fps at both north powerhouse and north shore sensors. Biologists and operators are working to resolve velocity issues. Velocities were out of criteria on September 20 and 25.

Since 0800 September 21 fish pump #1 has been operated in fast mode in response to fish ladder criteria issues.

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 began operation in fast mode at 0800 September 21.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
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: 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 twelve 14" orifices and six 10" orifices open to maintain optimal flume flow at current forebay elevation. The north makeup water valve remains in local control due to an automatic control motor hardware failure. Intermittent issues with local and remote operation of orifices for back flushing continue to be observed. Problems are reported to operations when they are identified.

Hours Collection Facility: The facility is in collection for transport mode at a 100% sample rate.

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

Spillway Weir: No spill

River Conditions

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
27.6	24.0	0.30	0	65.5	62.0	5.0	5.0

*Cooling water intake temperature.

Other

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

Invasive Species: There were 637 Siberian prawns collected in the sample this week. Of these, 502 were live collected and euthanized and 135 were mortalities when sampled. No signs of Zebra/Quagga mussels were found on submerged substrates.

Avian Activity: Bird wires were removed from the spillway tailrace area August 29 for crane barge access to spillway 1 for PIT tag detection array install. Biologist daily piscivorous bird counts at Lower Granite Dam are listed below.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
09/20	1400	1	20	0	0
09/21	1400	6	11	0	0
09/22	1005	24	37	0	0
09/23	1055	19	39	0	0
09/24	1321	14	32	0	0
09/25	1145	10	38	0	0
09/26	1739	0	9	0	0

Gas Bubble Trauma (GBT) Monitoring: GBT sampling is done for the season.

Adult Fish Trap Operations: Adult operation was changed to 24 hours 7 day a week operation for brood stock collection for transport to LFH and NPT hatcheries. Sample rate remains 20%.

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

Research:

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 incidentally collected as part of the normal adult trap daily sample as well as the recaptured previously PIT tagged using adult SbyC system. 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.