

**U.S. ARMY CORPS OF ENGINEERS  
WALLA WALLA DISTRICT  
FISH FACILITIES WEEKLY REPORT  
#39-2021**

**Project: McNary**

Biologist: Bobby Johnson and Denise Griffith

Dates: November 19-25, 2021

**Turbine Operation**

Yes	No	Turbine Unit Status
	X	All 14 turbine units available for service? (See table & comments below for details.)

\*All available turbine units are operated in accordance with App. C of the Fish Passage Plan.

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

Unit(s)	OOS		RTS		Outage Description
	Date	Time	Date	Time	
4	8/2	1018	2/ 28/22	N/A	Blade seals
7	10/4	0730	12/28	N/A	Nine-year overhaul/Blade seals
3	11/15	0731	12/23	N/A	Line 2 outage for BPA relays
13 & 14	11/23	1000	11/23	1100	ESBS camera inspections

Comments: The one percent peak efficiency constraint and unit priority are being followed per the 2021 Fish Passage Plan (FPP). RTS dates are subject to change.

**Adult Fish Passage Facilities**

The fisheries biologist and technician performed a measured inspection of the adult fishways on November 19, 21, and 23.

Fish Ladder Exits:

Yes	No	Location	Criteria	Measurements
X		Oregon Exit	Head over weir 1.0' to 1.3'	1.2' to 1.3'
X		Oregon Count Station Differential	0.0' to 0.5'	0.0' to 0.1'
X		Washington Exit	Head over weir 1.0' to 1.3'	1.2'
X		Washington Count Station Differential	0.0' to 0.5'	0.0' to 0.1'

Comments: Debris loads near the Oregon shore exit were very light. Debris loads near the Washington shore exit were minimal.

At the Oregon exit, one traveling screen alarm came in and was reset on November 21.

There are no other problems to report.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Oregon Entrance Head Differential	1.0' – 2.0'	1.2' to 1.3'
	X		NFEW2 Weir Depth	≥ 8.0'	7.3' to 7.7'
	X		NFEW3 Weir Depth	≥ 8.0'	7.3' to 7.8'
X			South Oregon Entrance Head Differential	1.0' – 2.0'	1.3' to 1.4'
	X		SFEW1 Weir Depth	≥ 8.0'	7.8' to 8.2'
	X		SFEW2 Weir Depth	≥ 8.0'	7.8' to 8.2'
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 1.7 fps
X			Washington Entrance Head Differential	1.0' – 2.0'	1.4'
X			WFE2 Weir Depth	≥ 8.0'	9.9' to 10.1'
X			WFE3 Weir Depth	≥ 8.0'	10.0' to 10.1'

Comments: NFEW2 and NFEW3 were out of criteria all week. This was mostly due to the lack of flow from the juvenile system, which remained in emergency bypass. SFEW1 and SFEW2 were out of criteria on November 23. These out of criteria points could be due to calibration drifts, set point adjustments, hydraulics and/or the general condition of the Oregon shore ladder system.

Fabrication of the six remaining FOG's is on hold until fish pump 3 repairs are completed.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Fish Pump Blade Angle	Auxiliary Water Supply System (AWS)
Yes				WA shore Wasco County PUD Turbine Unit
	Yes			WA shore Wasco PUD Bypass
Yes			26° to 27°	Oregon Ladder Fish Pump 1
Yes			23°	Oregon Ladder Fish Pump 2
		Yes		Oregon Ladder Fish Pump 3, RTS date is May 31, 2023
		Yes		OR North Powerhouse Pool supply from juvenile fishway

Comments: Fish pump 3 remained out of service. The estimated return to service date is subject to change. The Oregon north powerhouse entrance remained without the juvenile flow, with the system in emergency bypass until late February 2022.

**Juvenile Fish Passage Facility**

The system remained in emergency bypass for winter maintenance.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Minimal to moderate
X			Gatewell drawdown measured this week?	Daily
X			Gatewell drawdown acceptable?	
	X		Any debris seen in gatewells? (% coverage)	
	X		Any oil seen in gatewells?	

Comments: Current debris loads were minimal to moderate near the powerhouse and minimal beside the spillway. Incoming debris was minimal. Most of the debris appeared to be moving back and forth from the powerhouse to the Oregon shoreline.

No trash racks were cleaned this week.

There are no problems to report. A few pieces of woody and man-made material were removed from the slots.

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: All ESBS's are in place. Camera inspections in units 13 and 14 revealed no issues on November 23.

Daily VBS differential monitoring revealed no differentials out of criteria. One screen was cleaned on November 24. Only juvenile shad mortalities were observed.

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

Yes	No	NA	Item	Number of orifices in service
X			Did orifices operate satisfactory?	42
		X	Dewatering and cleaning systems operating satisfactory?	

Comments: With low debris loads and a temporary air supply line, orifice cycling remains at once a day. Water in the air line continues to be an issue. This problem and the temporary air supply line from the north end of the powerhouse will continue to be monitored. The south orifice in 8A slot appeared to have a blockage on November 21. The blockage could not be removed at the time, so the south orifice was closed, and the north orifice was opened immediately. A camera inspection of the south orifice will be scheduled in the near future.

All systems remain out for service for winter maintenance.

The contractor who is reinforcing the intake deck crane's east rail will also continue to be monitored.

Bypass Facility:

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

Comments: All bypass facility systems are down for water winter maintenance.

There are no problems to report.

Top Spillway Weir (TSW) Operations:

The TSW's are currently not in service.

**River Conditions**

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
157.4	118.6	9.8	0.0	53.0	49.0	6.0	6.0

Comments: The above data is provided by the control room. The data day runs from 0000 to 0000 hours. The recorded spill was spill for flow in excess of powerhouse capacity, which occurred on November 19.

Crane 6 is in service. Crane 7 is out of service. The crane 7's motor starter still needs to be replaced. A contract is required. The current target date for replacement will be in January. Both cranes' load limit indicators continue to be an issue.

### **Other**

Inline Cooling Water Strainers: The next cooling water strainer inspections will occur on December 7.

Avian Activity: During the fall, only casual avian observations are made.

In the spillway zone, gulls and cormorants were observed. The birds were mostly roosting around the basin. Cormorant numbers were moderate and stable. Gull numbers appeared to fluctuate greatly with the out migration of juvenile shad. When the spill was open, gulls feed but in moderate numbers.

In the powerhouse zone, some gulls were occasionally observed feeding.

In the bypass outfall zone, occasionally, few gulls were noted roosting on the bypass pipe. Cormorant numbers remained high with the birds roosting on the pipe. At the emergency bypass outfall, it is difficult to determine if the gulls are feeding in the outfall or powerhouse flow.

In the forebay zone, grebe and gull numbers fluctuated. The birds were mostly roosting on the water. Outside the zone, a few cormorants and gull flocks were noted roosting along the shorelines or on the water.

No hazing is occurring.

Invasive Species: The mussel station examinations on November 23 revealed no issues.

Siberian Prawn: There is nothing to report.

Fish Rescue/Salvage: There in nothing to report.

Research: There in nothing to report.

**Project: Ice Harbor**  
 Fisheries Biologist: Ken Fone

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**Turbine Operation**

Yes	No	Turbine Unit Status
	x	All 6 turbine units available for service (see table & comments below for details).

\*All available turbine units are operated in accordance with App. C of the Fish Passage Plan.

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

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind
2	11/1/21	0630	---	---	Annual maintenance

Comments: None.

**Adult Fish Passage Facility**

Ice Harbor Fish Facility staff inspected the adult fishways on November 22, 23 and 24.

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	
		x	North Powerhouse Entrance (NFE-2) 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: None.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply (AWS) System
5-6 pumps	2-3 pumps		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 2 square yards
x			Gatewell drawdown measured this week?	
x			Gatewell drawdown acceptable	
x			Any debris seen in gatewells (% coverage)	STSS partially blocking view into gatewells
	x		Any oil seen in gatewells?	

Comments: None.

Submersible Traveling Screens (STSS) / Vertical Barrier Screens (VBSs):

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

Comments: STSS are raised out of the water and stored in the gatewell slots for winter maintenance.

Orifices, Collection Channel, Dewatering Structure, and Flume:

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

Comments: The juvenile fish collection channel and bypass pipe are unwatered for winter maintenance.

Juvenile Fish Facility: The Juvenile Fish Facility is unwatered for winter maintenance.

Fish Sampling: Sampling at Ice Harbor Dam is concluded for the season.

Removable Spillway Weir (RSW): Voluntary spill for fish is done 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
21.7	16.7	0.0	0.0	53	50	9.9	9.0

\*Unit 1 scroll case temperature.

## Other

Inline Cooling Water Strainers: Unit 1, 2, 4, 5, and/or 6 turbine cooling water strainers were cleaned of a total of approximately 3,935 juvenile shad on November 20, 23, and 24.

Avian Activity: There were high numbers of mergansers, gulls, and pelicans that were resting or foraging at Eagle Island and along the south shore downstream of the dam. These birds were also occasionally observed foraging in the tailrace closer to the dam.

Invasive Species: No exotic species that are new to the area have been found.

Siberian Prawn: Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by the fish sampling contractor, frozen and properly disposed of in a landfill.

Fish Rescue/Salvage: None.

Research: No on-site research is currently going on.

**Project: Lower Monumental**

Biologists: Denise Griffith and Raymond Addis

**Turbine Operation**

Yes	No	Turbine Unit Status
	X	All 6 turbine units available for service (see table & comments below for details).

\* All available turbine units are operated in accordance with App. C of the Fish Passage Plan.

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

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
Unit 2	07/15/2019	0720	12/16/2021	ERTS	Annual, Draft Tube Liner

Comments: None

**Adult Fish Passage Facility**

The adult fishways were inspected by Corps biologists on November 22, 23 and 24.

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		X	South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0' or on sill	
X			South Shore Entrance (SSE-2) Weir Depth	$\geq$ 6.0'	
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	

Comments: The south powerhouse entrance weir (SPE-1) was on sill during all inspections with readings of 7.3, 7.0 and 7.1 feet, respectively. The south powerhouse entrance weir (SPE-2) was on sill during all inspections with readings of 7.3, 7.0 and 7.1 feet, respectively. The south shore entrance weir (SSE-1) was on sill during the November 22 and 23 inspections with both readings of 7.9 feet.



Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
Yes			AWS Fish Pump 1
Yes			AWS Fish Pump 2
Yes			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)	0 yds <sup>2</sup>
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 - 10%
	X		Any oil seen in gatewells?	

Comments: None

STSs/VBSs:

Yes	No	NA	Item
X			STSs deployed and in service in operating and available units?
	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 on cycle mode during the reporting period due to average sub-yearling Chinook salmon and sockeye salmon 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?	18
X			Dewaterer and cleaning systems operating satisfactory?	

Comments: None

Collection Facility: The fish collection facility out of service for winter maintenance.

Transport Summary: Transport at Lower Monumental ended June 20.

Spillway Weir: Fall spill ended on November 15.

## 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
21.3	15.3	0	0.0	50.5	49.6	5.9	5.4

\*Scrollcase temperatures.

## Other

Inline Cooling Water Strainers: Cooling water strainer inspections will resume in December.

Avian Activity: Highest counts of foraging piscivorous birds in tailrace (SWT1+PH1+PH2) at Lower Monumental Dam are reported in the table below.

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
11/22/2021	1315	35	19	0	8	0
11/23/2021	1300	10	21	0	0	0
11/24/2021	1300	18	15	0	0	0

Comments: Bird hazing efforts by USDA personnel ended June 2.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on November 8.

Siberian Prawn: Siberian prawn collection ended on October 1.

Fish Rescue/Salvage: No fish rescue or salvage occurred.

Research: No research is occurring currently.

**Project: Little Goose**

Biologists: Chuck Barnes and Deborah Snyder

**Turbine Operation**

Yes	No	Turbine Unit Status
	X	All 6 turbine units available for service (see table & comments below for details).

\*All available turbine units are operated in accordance with App. C of the Fish Passage Plan.

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

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
5	04/14/17	14:11	12/31/2022	17:00	Spider and upper guide bearing repair.
6	03/18/21	14:17	N/A	17:00	T2 C phase ground fault

Comments: Little Goose experienced a T2 transformer ground on March 18 at 14:17. T2 transformer and Units 5 and 6 will be out of service until repairs/replacement can be performed.

**Adult Fish Passage Facility**

Little Goose fish facility staff inspected the adult fishway on November 22, November 23, and November 24.

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		

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
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		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. The fish control system still has a faulty hydromechanical for the NSE1 weir and is currently awaiting repair. Subsequent faulty NSE fish control system channel and tailwater readings were encountered and remedied with physical staff gauge and water level depth indicator measurements.

Ladder exit cooling pumps were placed into service at 2052 hrs on 12 June when 0.5m forebay temperatures exceeded 64°F. At 16:00 on September 19 the 0.5m forebay temperature met the qualifying criteria to shut down the ladder exit cooling pump for the season.

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: Fish pumps 1 and 2 were returned to service on February 23. Fish pump 3 returned to service April 7.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comment
X			Forebay debris load acceptable? (amount)	100ft <sup>2</sup> minimum – 295ft <sup>2</sup> maximum
	X		Gatewell drawdown measured this week?	
		X	Gatewell drawdown acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: There is currently fluctuating minimal floating woody debris inside the trash shear boom. Gatewell drawdowns were not performed for this reporting period.

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?
	X		VBSs inspected this week?

Comments: ESBS's were installed in Units 2, 3 and 4 on March 22 and 23. ESBS/VBS camera inspections for all units took place June 8-10. No camera inspections took place during this report period. Unit 6 has 1 remaining ESBS currently raised and stored within the Unit 5-B slot position. Unit 6 bulkheads are in place; both Units 5 and 6 are out of service.

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 juvenile bypass system was watered up on March 22 and began daily collection for transportation on April 23.

Collection Facility: Collection for condition monitoring in conjunction with secondary bypass commenced on April 1 with the first sample being conducted on April 2. Every other day collection and sampling occurred through April 22. Daily collection for transportation began on April 23 with the first daily barge departing on April 24. Collection ceased on November 1 and the collection facility was dewatered for cleaning and winter maintenance.

Transport Summary: Daily fish transportation via barge began on April 24. Every other day barge transportation began May 18 and ended June 21. Collection for transport resumed at 0700 hrs July 5 and every other day truck transportation began July 6. Collection ceased November 1 at 0700 with conversion to primary bypass mode and final truck departure to end the season.

Spillway Weir: Spring spill operations began on April 3 with the ASW in high crest. ASW day surface spill emergency procedure began July 3 at 0900 hours and ceased July 9 at 1600 hours. Final Off-season surface spill activity for adult steelhead downstream passage as outlined in the 2020 NOAA Fisheries CRS Biological Opinion took place November 14.

### 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
20.1	15.6	0.0	0.0	51.1	50.5	5.3	4.9

\*Ladder temperature.

### Other

Inline Cooling Water Strainers: Inline cooling strainer inspections commenced on January 13. Inspections continued in accordance with the Fish Passage Plan (FPP) through July and results were submitted to the District.

Avian Activity: Daily piscivorous bird counts at Little Goose Dam began on April 1. USDA hazing activities began on March 29 and ended June 19. Daily bird counts ended for the season with the October 31 count.

Invasive Species: No invasive species have been observed on the mussel station.

Siberian Prawn: Juvenile fish collection began on April 1. 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 concluded for the season with the November 1 counts.

Gas Bubble Trauma (GBT): GBT monitoring for the 2021 season concluded July 26.

Fish Rescue/Salvage: No fish rescue / salvage activities were performed this period.

Research: The Nez Perce Tribe (NPT) began adult steelhead kelt collection on May 3 and ended June 30.

**Project: Lower Granite**

Biologists: Elizabeth Holdren and David Miller

**Turbine Operation**

Yes	No	Turbine Unit Status
	X	All 6 turbine units available for service (see table & comments below for details).

\*All available turbine units are operated in accordance with App. C of the Fish Passage Plan.

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

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
2	11/01	0717			Annual Maintenance
3	11/22	1315	11/22	1602	SQ1 Switchgear Change Out
4	11/22	1047	11/22	1238	SQ1 Switchgear Change Out

Comments: None.

**Adult Fish Passage Facility**

Lower Granite Biologists and Anchor QEA staff inspected the adult fishway November 22, 23, and 24.

**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'	
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	$\geq$ 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	
X			North Shore Entrance (NSE-2) Weir Depth	$\geq$ 7.0' or on sill	
	X		North Shore Channel/Tailwater Differential	1.0'–2.0'	0.8', 0.8', 0.9'
X			Collection Channel Surface Velocity	1.5 – 4.0 fps	

Comments: Ladder collection channel operation and configuration are being evaluated to resolve ongoing issues. FOGs 1, 4, 7, and 10 are in operation. North shore and north powerhouse channel/tailrace head differential's ability to maintain criteria range is dependent of tailrace conditions. Lower Granite electrical crew continue to work on the ladder control system issues.

Auxiliary Water Supply System:

Operating Satisfactorily	Standby	Out of Service	Auxiliary Water Supply (AWS)
		Yes	AWS Fish Pump 1
Yes			AWS Fish Pump 2
Yes			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)	Weekly average 24.0 yds <sup>2</sup>
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: None.

Collection Facility: N/A

Transport Summary: N/A

Spillway Weir: A total of 250,456 PIT tagged smolts have been detected over the RSW this season compared to a total of 23,630 smolts detected in the juvenile system. A total of 732 adult PIT tagged steelhead, 97 Chinook salmon and 2 Sockeye salmon have been detected at the RSW this season compared to 107 adult steelhead, 62 Chinook salmon and 1 Coho salmon detected at the juvenile bypass system. Since October 1, 29 of the 46 PIT tagged fallback steelhead have been tagged at the Lower Granite Adult Trap.

The RSW operation for overshoot steelhead concluded November 14 and will remain closed for the duration of the winter.

## 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
21.8	18.3	0.0	0.0	48.0	47.0	5.0	5.0

\*Cooling water intake temperature.

## Other

Inline Cooling Water Strainers: N/A

Invasive Species: No zebra/quagga mussels were detected on the trap substrate.

Avian Activity: N/A

Gas Bubble Trauma (GBT) Monitoring: N/A

Adult Fish Trap Operations: The adult ladder turnpool gate was closed at 1430 hours November 18 ending the adult trapping season. The adult trap was dewatered and winterized November 22.

Fish Rescue/Salvage: N/A

Research: N/A