

Out of Criteria – NWW Weekly Report #39 - November 24-30, 2023

**1. McNary**

Unit 11 OOS for overhaul until 12/21, Units 9&10 OOS for Control Upgrades until April 2024.

Yes	No	Sill	Location	Criteria	Measurements
	X		NFEW2 Weir Depth	≥ 8.0'	7.7' to 7.9'
	X		NFEW3 Weir Depth	≥ 8.0'	7.6' to 8.0'
	X		SFEW1 Weir Depth	≥ 8.0'	7.6' to 8.0'
	X		SFEW2 Weir Depth	≥ 8.0'	7.7' to 7.9'

Comments: Oregon entrances, NFEW2 and SFEW2, were out of criteria all week. Oregon entrances, NFEW3 and SFEW1, were out of criteria on November 24 and 26. These out of criteria points were due to fish pump 2 being out of service most of the week. However, after the pump returned to service, the biologist requested all Oregon entrances' set points be adjusted to hopefully return the weirs to criteria on November 28.

For line and bus switching, fish pump 3 was out of service on November 27, from 0604 to 0617 hours. After completion of the oil leak investigation, fish pump 2 returned to service on November 28, at 1215 hours.

The downstream dogging mechanisms for bays 4 and 5 remain out for rehabilitation and will be installed 12/1. See MOC 23MCN10.

**2. Ice Harbor**

Unit 1 OOS for turbine runner replacement and stator rewind. Unit 4 OOS for 6-year overhaul. Unit 5 OOS 11/13/23, RTS 11/30/23 for Annual Maintenance.

North shore AWS pump #1 has been out of service since March 1 because of a hydraulic cylinder leak on the butterfly valve. Repair is planned for the winter maintenance period.

**3. Lower Monumental**

Spillgate 5 and Spillgate 7 are out of service for gearbox replacement.

Unit 6 is OOS for T-2 repairs, ERTS 1/2/2024. Unit 1 OOS on 11/30/2023, ERTS 12/14/2024 for Annual Maintenance.

**4. Little Goose**

Unit 5 ERTS date to 12/1/2023, testing scheduled for winter maintenance period in December. Unit 2 OOS for Unit Annual until December 1. On 11/28/23 there was an emergency line outage, forcing unit 3 out of service. See MFR 23 LGS 13 for more details.

The fishway cooling pump has been out of operation since June 29, repairs and replacement pump(s) are in progress. On 11/28/23 an emergency line outage forced unit 3 out of service, spill gates were deployed to maintain river flow, and Auxiliary water pump #2 went down. This incident affected fish attraction flow at all 3 entrances (See MFR 23 LGS 13 for more details).

## 5. Lower Granite Dam

Unit 1 OOS for annual maintenance. Unit 2- 6 OOS for daily line outage 11/30/2023 thru 12/21/2023.

Collection Channels:

Yes	No	Sill	Location	Criteria	Comments
	X		North Powerhouse Entrance (NPE-1) Weir Depth	$\geq 8.0'$ or on sill	7.9'
	X		North Powerhouse Entrance (NPE-2) Weir Depth	$\geq 8.0'$ or on sill	7.9'
	X		North Shore Channel/Tailwater Differential	1.0'-2.0'	0.7', 0.6', 0.6'
	X		North Powerhouse Entrance Channel/Tailwater Differential	1.0'-2.0'	0.9', 0.9', 0.9'
	X		North Shore Entrance (NSE-1) Weir Depth	$\geq 7.0'$ or on sill	6.9', 6.9'
	X		North Shore Entrance (NSE-2) Weir Depth	$\geq 7.0'$ or on sill	6.9', 6.9'

AWS pumps 1 and 2 remain in service. AWS pump 2 continues to have issues with tripping offline due to bearing high temperature alarms believed to be caused by a faulty circuit board. Electrical crew continues to troubleshoot this issue. All three AWS pumps were removed from service from 1209-1216 hours November 28 to test the DC ground in the control panel. Electrical crew continues to troubleshoot this issue.

**U.S. ARMY CORPS OF ENGINEERS  
WALLA WALLA DISTRICT  
FISH FACILITIES WEEKLY REPORT  
#38-2023**

**Project: McNary**

Biologist: Bobby Johnson and Paul Bertschinger

Dates: November 24-30, 2023

**Turbine Operation**

Yes	No	Turbine Unit Status	Hard	Soft
	X	All 14 turbine units available for service? (See table & comments below for details.)		
	X	Available turbines operated within 1% peak efficiency? Constraint in effect.		X

Table 1. McNary Unit Outages (OOS) and Return to Service (RTS)

Unit(s)	OOS		RTS		Outage Description
	Date	Time	Date	Time	
11	10/10	0719	12/21	NA	9-year overhaul
14	11/23	0211	11/27	0907	Exciter issue
9 & 10	11/27	0631	4/26/24	NA	Control system upgrades
12	11/27	0631	11/30	1607	Control system upgrades
1, 2 & 3	11/28	0912	11/28	1011	ESBS camera inspections, rotated through units

Comments: RTS dates are subject to change. Units ran outside the soft one percent criteria at BPA's request as needed during the week.

**Adult Fish Passage Facilities**

Measured inspections of the adult fishways occurred on November 24, 26 and 28.

Fish Ladder Exits:

Yes	No	Location	Criteria	Measurements
X		Oregon Exit	Head over weir 1.0' to 1.3'	1.0' to 1.1'
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'	1.0' to 1.1'
X		Washington Count Station Differential	0.0' to 0.5'	0.0'

Comments: Debris loads were minimal near both exits.

One of the Oregon shore visitors' center window brushes was found stuck down on November 27. The issue was immediately resolved.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Oregon Entrance Head Differential	1.0' – 2.0'	1.4' to 1.9'
	X		NFEW2 Weir Depth	≥ 8.0'	7.7' to 7.9'
	X		NFEW3 Weir Depth	≥ 8.0'	7.6' to 8.0'
X			South Oregon Entrance Head Differential	1.0' – 2.0'	1.4' to 1.6'
	X		SFEW1 Weir Depth	≥ 8.0'	7.6' to 8.0'
	X		SFEW2 Weir Depth	≥ 8.0'	7.7' to 7.9'
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 2.0 fps
X			Washington Entrance Head Differential	1.0' – 2.0'	1.5' to 1.6'
X			WFE2 Weir Depth	≥ 8.0'	9.3' to 9.6'
X			WFE3 Weir Depth	≥ 8.0'	9.3' to 9.5'

Comments: Oregon entrances, NFEW2 and SFEW2, were out of criteria all week. Oregon entrances, NFEW3 and SFEW1, were out of criteria on November 24 and 26. These out of criteria points were due to fish pump 2 being out of service most of the week. However, after the pump returned to service, the biologist requested all Oregon entrances' set points be adjusted to hopefully return the weirs to criteria on November 28. Also, that day, NFEW3 was found in manual mode and was returned to automatic mode.

Three floating orifice gates (FOG's) slots, W32, W37 and W 41 remain closed. Nine of 12 slots are open.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Blade angle	Auxiliary Water Supply System (AWS)
Yes				WA shore Wasco County PUD Turbine Unit
	Yes			WA shore Wasco PUD Bypass
Yes			28° & 22°	Oregon Ladder Fish Pump 1
Yes*		Yes*	NA & 22°	Oregon Ladder Fish Pump 2
Yes*			30° & 23°	Oregon Ladder Fish Pump 3
Yes				OR North Powerhouse Pool supply from juvenile fishway

\*Comments: For line and bus switching, fish pump 3 was out of service on November 27, from 0604 to 0617 hours. After completion of the oil leak investigation, fish pump 2 returned to service on November 28, at 1215 hours.

**Juvenile Fish Passage Facility**

Fall primary bypass season continues with facility maintenance, cleaning, and repairs occurring. To enhance maintenance, the facility remains dewatered.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Light
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: Debris loads were light near the powerhouse. Residual debris loads beside the spillway and new incoming debris loads were minimal. Weather changes move the debris from the powerhouse to the Oregon shore and back. Most of the debris was woody material and aquatic vegetation. No trash rack cleaning was scheduled.

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: ESBS's were deployed in all units. The ESBS brush cycle for on the screen in 14A slot tripped multiple alarms on November 28. The electrical staff immediately resolved the issue. Camera inspections in units 1, 2 and 3 revealed no issues on November 28. A new ESBS control system is currently being tested and will be installed before next season.

Daily VBS differential monitoring continued. No high differentials were recorded. A total of six VBS's were cleaned on November 27 and 28. The VBS's in unit 11 were inspected, which includes cleaning, on November 28. No fish were observed during cleaning and inspection.

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

Yes	No	NA	Item	Number of orifices in service
X			Did orifices operate satisfactory?	39
X*			Dewatering and cleaning systems operating satisfactory?	

\*Comments: The system remains in primary bypass. Orifices were adjusted for VBS cleaning and inspection as required. Orifice operators and attraction lighting were repaired as needed.

The light fixture for 12B slot south orifice remains removed. The north orifice, with the attraction light on, has been in use.

Seven water elevation alarms (a mix of high and low) came in on November 24, from 0543 hours to 2133 hours. A series of alarms came in on November 28, at 0737 hours and these alarms cleaned at 0923 hours. It appears the PLC lost power during this time span, but more investigation is required. There was no indication of an issue in the channel itself. These alarms were only recorded in the control room. Two high water elevation alarms came in on November 29, at 1903 hours and 2012 hours. Four high and one low water elevation alarms came in on November 30, from 0413 hours to 1516 hours. The alarms did clear quickly but were still coming in more frequently than normal. These fluctuations do not adversely affect the flow down the full flow flume and bypass pipe during primary bypass. However, the issue still needs more attention.

Bypass Facility:

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

Comments: All system are out of service for winter maintenance, which is occurring. The facility remains dewatered.

TSW Operations: The TSW in bay 19 remains out of service with a standard gate in place. The TSW in bay 20 remains closed until the spring fallback season.

## 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
144.2	113.9	0.0	0.0	51.0	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.

Cranes 6 and 7 can perform their next overloaded lift on April 18, 2024. Scheduled maintenance on crane 7 continues.

All hoists are functional with maintenance occurring. Due to their overload issues, the hoists are now under restrictions similar to the cranes. As a result, the spillway hoists are limited to split leaf operations, with limited full gate operations with the seven hoists within the 100 to 125 percent of capacity until capacity issues are resolved. Options for future spill are currently being considered.

The downstream dogging mechanisms for bays 4 and 5 will be installed December 1.

Spillgate maintenance is also occurring.

### Other

Inline Cooling Water Strainers: The next cooling water strainer inspections will occur on December 5.

Avian Activity: With fall primary bypass season, casual bird observations continue.

For the report week, no terns, or pelicans were observed.

In the spillway zone, gulls and cormorants were noted roosting. Gull numbers began to decrease, with approximately 50 birds in the tailwater area.

At the bypass outfall zone, a few gulls and a large number of overwintering cormorants were noted roosting. Cormorants numbered 75 birds in the tailwater area. On most days, the birds did not feed at the outfall. The juvenile shad out migration has begun to decrease.

In the powerhouse zone, gulls in fluctuating numbers were infrequently noted roosting and feeding. Gulls moved freely between the three tailwater zones.

In the forebay zone, grebes (maybe as many as 200 at the high point), and few fly-by gulls were observed along with one great blue heron. Outside the zone, a few cormorants and gulls along with one kingfisher were noted.

No hazing is occurring currently.

Invasive Species: The mussel station examinations revealed no issues on November 26.

Siberian Prawn: With sample season concluded, prawns have not been observed.

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

Research: There is nothing more to report.

**.Project: Ice Harbor**

Biologist: Ken Fone

Biological Science Technician: Ben McArthur

Dates: November 24 – November 30, 2023

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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).
x		All available turbine units are operated in accordance with Appendix 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	
1	6/27/23	0708	---	---	Turbine runner replacement and stator rewind
4	10/02/23	0930	---	---	6-year overhaul
5	11/13/23	0700	11/30/23	1447	Annual maintenance

Comments: None.

**Adult Fish Passage Facility**

Ice Harbor Fish Facility staff inspected the adult fishways on November 27, 28, and 29.

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 (AWS) System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System
5 pumps	3 pumps		Status of the 8 south shore AWS pumps
2 pumps		1 pump	Status of the 3 north shore AWS pumps

Comments: North shore AWS pump #1 has been out of service since March 1 because of a hydraulic cylinder leak on the butterfly valve. The repair is planned for the winter maintenance period.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
x			Forebay debris load acceptable? (amount)	Average of 18 square yards
x			Gatewell drawdown measured this week?	
x			Gatewell drawdown acceptable	
x			Any debris seen in gatewells (% coverage)	0-3%
	x		Any oil seen in gatewells?	

Comments: None.

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	STS/VBS inspection results acceptable?
		x	VBSs differentials checked this week?
		x	VBSs differentials acceptable?

Comments: Unit 3 STSs will not be inspected this month because of the risk of getting the underwater video camera tangled in the fish release pipes and hoses that are installed on those STSs. Unit 3 screens will be temporarily pulled out of the water to detach the pipes and hoses on December 1, and will be inspected while they are out of the water.

Orifices, Collection Channel, Dewatering Structure, and Flume:

Yes	No	NA	Item	Number open and in service
x			Orifices operating satisfactory?	21
	x		Dewaterer and cleaning systems operating satisfactory?	

Comments: The actuator for the water regulating weirs in the collection channel is in local control due to a problem with the automatic control function. The weirs are being operated at the actuator to adjust the water level as needed until the problem can be fixed.

The light on orifice 1BN was found to be out on November 11. Orifice 1BS was open in place of 1BN until the ballast was replaced on November 28. These types of ballasts are no longer manufactured, so a good ballast was taken from one of the south orifices on unit 1.

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



Fish Sampling: Juvenile fish sampling is done for the season.

Removable Spillway Weir (RSW): Seasonal spill for fish passage 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
21.6	13.4	0	0	52	51	9.3	8.2

\*Unit 1 scroll case temperature.

### Other

Inline Cooling Water Strainers: Turbine unit cooling water strainers were last cleaned of juvenile shad on November 22. Pressure differentials across the strainers are being monitored as an indication of strainer clogging from the buildup of juvenile shad.

Avian Activity: There was moderate piscivorous bird activity observed around the project.

Invasive Species: None

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: None.

**Project: Lower Monumental**

Biologists: Denise Griffith and Raymond Addis

Dates: November 24 - 30, 2023

**Turbine Operation**

Yes	No	Turbine Unit Status		
X		All 6 turbine units available for service (see table & comments below for details).	Hard	Soft
X		Available turbines operated within 1% peak efficiency? Constraint in effect.	X	

Comments: 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 1	11/30/23	0700	12/14/23	ERTS	Annual maintenance
Unit 6	08/03/23	22:00	01/02/24	ERTS	T-2 Repairs

Comments: Unit 6 is out of service awaiting total load testing of T-2 which will take place after the end Fish Passage Plan of unit priority.

**Adult Fish Passage Facility**

Lower Monumental fish facility staff inspected the adult fishways on November 27, 28 and 29.

Fish Ladder:

Yes	No	Location	Criteria	Measurements
X		North Ladder Exit Differential	Head $\leq$ 0.5'	
X		North Ladder Picketed Lead Differential	Head $\leq$ 0.4'	
X		North Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	
X		South Ladder Exit Differential	Head $\leq$ 0.5'	
X		South Ladder Picketed Lead Differential	Head $\leq$ 0.3'	
X		South Ladder Depth over Weirs	Head over weir 1.0' to 1.3'	

Comments: None.

Fishway Entrances/Exits 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'	
X			South Shore Entrance (SSE-2) Weir Depth	$\geq$ 6.0'	
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	

Comments: South Powerhouse Entrance SPE-1 weir was at sill during all inspections with readings 6.8, 7.4 and 7.2 feet respectively. South Powerhouse Entrance SPE-2 weir was at sill during all inspections with readings 6.8, 7.4 and 7.2 feet respectively. South Shore Entrance SSE-1 weir was at sill during the November 27 inspections with a reading of 7.7 feet.

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)	440 yd <sup>2</sup>
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
	X		Any debris seen in gatewells (% coverage)	0 – 6%
	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: None.

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 facility is dewatered for winter maintenance.

Transport Summary: Collection for transport ended for the season.

Spillway Weir: There was no spill during this reporting period. Spillgate 5 seal replacement has been completed. Spillgate 5 and Spillgate 7 are out of service for gearbox replacement, estimated return to service on September 30, 2024.

## 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
20.5	13.2	0.0	0.0	48.2	48.0	7.2	6.2

\*Scrollcase temperatures.

### Other

Cooling Water Strainers: The cooling water strainers will not be examined again until December.

Avian Activity: Bird counts of foraging piscivorous birds at Lower Monumental Dam ended on September 30. Bird hazing by USDA personnel is over for the season.

Invasive Species: Mussel traps will be inspected for zebra or quagga mussels in December.

Siberian Prawn: Siberian prawn collection ended for the season.

Fish Rescue/Salvage: No fish salvage took place this week.

Research: A PNNL study on behavior and survival of juvenile Pacific lamprey at Lower Monumental Dam started on April 1. PNNL has yet to remove the hydrophone in the primary dewaterer currently.

**Project: Little Goose Dam**

Biologist: Deb Snyder, Brooke Gerard, Cole Reeves

Dates: November 24 – November 30, 2023

**Turbine Operation**

Yes	No	Turbine Unit Status
	X	All 6 turbine units available for service? (See table and comments below for details)

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

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
5	4/14/2017	1411	12/01/2023	ERTS	Spider and upper guide bearing repair.
2	10/11/2023	0500	12/01/2023	1310	Unit Annual, Cavitation Repair
3	11/28/2023	0353	11/28/2023	1003	Emergency line outage

Comments: Contractual obligations and performance issues realigned the Unit 5 ERTS date into 2023, testing scheduled for winter maintenance period. On 11/28/23 there was an emergency line outage, forcing unit 3 out of service. See MFR 23 LGS 13 for more details.

**Adult Fish Passage Facility**

USACE staff inspected the adult Fishway on November 27, 28, 29, and 30.

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	X		South Shore Entrance (SSE-1) Weir Depth	$\geq$ 8.0'	7.2, 11/28
X	X		South Shore Entrance (SSE-2) Weir Depth	$\geq$ 8.0'	7.2, 11/28
X			South Shore Channel/Tailwater Differential	1.0' – 2.0'	
X	X	X	North Powerhouse Entrance (NPE-1) Weir Depth	$\geq$ 7.0' or on sill	5.4, 11/28
X	X	X	North Powerhouse Entrance (NPE-2) Weir Depth	$\geq$ 7.0' or on sill	5.4, 11/28
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	
X	X		North Shore Entrance (NSE-1) Weir Depth	$\geq$ 6.0' or on sill	5.3, 11/28
X	X		North Shore Entrance (NSE-2) Weir Depth	$\geq$ 6.0' or on sill	5.3, 11/28
X			North Shore Channel/Tailwater Differential	1.0'–2.0'	
X			Collection Channel Surface Velocity	1.5 – 4.0 fps	

Comments: The adult fishway was initially returned to service on February 14, dewatered February 16 due to discovery of a second fish viewing window leak, then subsequently watered back up and commissioned for the season on February 23. The AWS pumps returned to service on February 23. The Fish Ladder Exit Cooling Water Pump was pulled, inspected, and readied for modest repairs on February 21. The Collection Channel Surface Velocity is measured at NPE. Rickly channel velocity measurements were completed and met criteria on November

2. Transponder readings documenting the Fish Ladder Depth over Weirs began displaying data inconsistent with physical staff gauge measurements beginning March 30. The North Shore fish entrance weirs continue to experience discrepancy readings between the Fish System Control (FSC) board and physical weir height measurements. We are working with SMP contracted personnel to standardize reporting to default to physical staff gauge measurements when FSC board discrepancies are detected. Criteria for activation of Fish Ladder Exit Cooling Pump was met, and the system was started at 2030 hours on June 7. The Fish Ladder Exit Cooling Pump failed during the 0900 hour on June 29<sup>th</sup> initially from two ground fault alarms, details outlined in 23 LGS 09 MFR. On 11/28/23 an emergency line outage forced unit 3 out of service, spill gates were deployed to maintain river flow, and Auxiliary water pump #2 went down. This incident affected fish attraction flow at all 3 entrance (See MFR 23 LGS 13 for more details).

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
X			AWS Fish Pump 1
X		11/28, 0130 to 1400	AWS Fish Pump 2
X			AWS Fish Pump 3

Comments: Fish pumps 1, 2, and 3 were returned to service February 23. On November 28 AWS #2 temporarily went down concurrent to the emergency line outage. AWS #1 and #3 ran at higher RPMs to compensate.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comment
X			Forebay debris load acceptable? (amount)	High 30 ft <sup>2</sup> – Low 0 ft <sup>2</sup>
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: The forebay maintained minimal floating debris inside the trash shear boom with the highest measurement occurring on November 27 at 5 ft<sup>2</sup>. The overall total forebay debris high occurred on November 30 at 30 ft<sup>2</sup>.

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: Installation of Unit 4-6 ESBS's were completed on March 13 and installation of units 1-3 took place March 14. Underwater camera inspections of all unit gatewell VBS screens occurred June 12, 13, and 14. No deficiencies were found; detailed notes were taken and forwarded to mechanical crew personnel in preparation for upcoming scheduled unit annual maintenance activities. During unit 6 annual, VBS screens in slot A were pulled and the few remaining stainless-steel fasteners were refurbished with nylon replacements.

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: The juvenile bypass system was initially watered up March 6, was halted to fix pinhole leaks discovered in the 42" primary emergency fish bypass pipe, resumed and was fully commissioned on March 7.

Collection Facility: The juvenile collection facility watered up on March 21. Every other day collection for condition monitoring in conjunction with secondary bypass began March 25 with the first sample being conducted on March 26. Everyday collection began April 23 coinciding with every other day barge transportation. Barging transportation concluded with the final barge departure of June 19 returning to a combination of everyday condition sampling and secondary bypass operations. Every-other day primary by-pass was initiated on July 11 due to water temperatures above 68°F. Every day collection resumed at 0700 on August 1<sup>st</sup> corresponding with the start of every other day trucking operations as per the FPP. Collection ended for the season with the final sample on November 1.

Transport Summary: Collection for fish transportation began April 23 with the first barge departure on April 24. Every other day barging is scheduled thereafter pending situational transition to everyday barging due to any unforeseen increase in fish numbers. Barge transportation for the season ended with the final barge departure on June 19. Collection for truck transport operations began August 1 with the first truck departure on August 2, and the last truck departed on November 1.

Spillway Weir: Little Goose began operation of the adjustable spillway weir (ASW) on March 1 to facilitate passage of adult steelhead overshoots. Operation occurred three days each week every other day for four hours in the morning. Spring spill operations began as scheduled on April 3. On June 12 the ASW was adjusted to high crest at 0840 hours per teletype instructions reducing ASW outflow from 11 to 7.4 kcfs due to decreased reservoir inflows. Summer spill operations began as scheduled on June 21. On August 1 at 14:02 hours the ASW was closed per RCC teletype in conjunction with FPP Chapter 8 section 2.3.2.7.e, diminished outflows below the 35 kcfs threshold.

**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
20.10	15.20	2.6	0	49.3	46.3	6.0	6.0

\*Ladder temperature.

**Other**

Inline Cooling Water Strainers: Inline cooling strainer inspections commenced on December 1, 2022. Inspections will continue in accordance with the Fish Passage Plan (FPP) and results will be submitted to the District.

Avian Activity: Daily piscivorous bird counts at Little Goose Dam are scheduled to begin April 1, while USDA-APHIS bird abatement contract services are in place. Daily bird counts ended for the season on November 1.

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

Siberian Prawn: Juvenile fish collection began March 25. Siberian prawns collected in the sample at the Juvenile Fish Facility are humanely euthanized by Oregon Department of Fish and Wildlife and EAS Bio personnel, 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): Oregon Department of Fish and Wildlife began GBT monitoring services starting on April 4, 2023. Final season GBT monitoring occurred on July 26 and 27th. Of the 46 fish examined, 0 fish exhibited signs of GBT.

Fish Rescue/Salvage: Fish rescue operations for gatewell 1A occurred on November 20. All results were submitted to district.

Research: The Nez Perce Tribe (NPT) began adult steelhead kelt collection efforts on March 26 and concluded collection on July 1.



**Project: Lower Granite**

Biologists: David Miller/Steve Lee

Dates: November 24-30, 2023

**Turbine Operation**

Yes	No	Turbine Unit Status	Hard	Soft
	X	All 6 turbine units available for service (see table & comments below for details).		
X		Available turbines operated within 1% peak efficiency? Constraint in effect.		X

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

Unit	OOS		RTS		Outage Description
	Date	Time	Date	Time	
1	11/20/23	0701			Annual Maintenance
1-6	11/30/23	0600	12/21/23	1800	Daily Line Outages for T1 Rehab

Comments:

**Adult Fish Passage Facility**

Lower Granite biologists inspected the adult fishway on November 27, 28, 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:

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	7.9'
	X		North Powerhouse Entrance (NPE-2) Weir Depth	$\geq$ 8.0' or on sill	7.9'
	X		North Powerhouse Entrance Channel/Tailwater Differential	1.0'–2.0'	0.9', 0.9', 0.9'
	X		North Shore Entrance (NSE-1) Weir Depth	$\geq$ 7.0' or on sill	6.9'
	X		North Shore Entrance (NSE-2) Weir Depth	$\geq$ 7.0' or on sill	6.9'
	X		North Shore Channel/Tailwater Differential	1.0'–2.0'	0.7', 0.6', 0.6'
X			Collection Channel Surface Velocity	1.5 – 4.0 fps	

Comments: Ladder collection channel operation and configuration will continue to be evaluated this season to resolve ongoing issues. FOGs 1, 4, 7, and 10 are in operation. Electrical crew continues to calibrate the ladder when issues are reported. SSE weir gates were placed into manual/local operation 11/20/2023 to reduce the frequency of OOC operations at this entrance.

Auxiliary Water Supply System:

Operating Satisfactorily	Standby	Out of Service	Auxiliary Water Supply (AWS)
No			AWS Fish Pump 1
No			AWS Fish Pump 2
	Yes		AWS Fish Pump 3

Comments: AWS pumps 1 and 2 remain in service. AWS pump 2 continues to have issues with tripping offline due to bearing high temperature alarms believed to be caused by a faulty circuit board. All three AWS pumps were removed from service from 1209-1216 hours November 28 to test the DC ground in the control panel. Electrical crew continues to troubleshoot this issue.

**Juvenile Fish Passage Facility**

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	60.3 sq yd
	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:

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: ESBS's were removed November 13-15.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

Yes	No	NA	Item	Number open and in service
X			Orifices operating satisfactory?	18
X			Dewatering and cleaning systems operating satisfactory?	

Collection Facility: The juvenile bypass system is in Primary Bypass.

Transport Summary: Transport concluded November 1. For the season, 20,083 fish were transported by truck and 3,041,835 were transported by barge from Lower Granite.

Spillway Weir PIT OBS: Late summer spill started August 15. There have been 250 adult and 84,774 juvenile Chinook salmon; 797 adult and 54,967 juvenile steelhead; 35 adult and 2,981 juvenile Coho salmon; and 12,162 juvenile Sockeye salmon detected at the RSW since March 1 (DART). Overshoot spill ended November 15.

Juvenile Bypass System PIT OBS: There have been 47 adult and 45,356 juvenile Chinook salmon; 227 adult 38,038 juvenile steelhead; 38 adult and 1,209 juvenile Coho salmon; and 1,141 juvenile Sockeye salmon detected through the JBS since March 15 (DART).

### 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
20.8	14.1	1.6	0.0	46.7	45.0	5.0	4.9

\*Cooling water intake temperature.

Comments:

### Other

Inline Cooling Water Strainers: N/A

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

Adult Fish Trap Operations: N/A

Fish Rescue/Salvage: Unit 1 Draft tube; November 28.