U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#37-2022

Project: McNary
Biologist: Bobby Johnson and Paul Bertschinger
Dates: November 11 – November 17, 2022

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).

	OOS		RTS		
Unit(s)	**Date**	**Time**	**Date**	**Time**	**Outage Description**
9	10/11	1008	2/3/23	NA	9-year overhaul
10 to 12	11/15	1000	11/15	1130	ESBS camera inspections, rotated units

Comments: The one percent peak efficiency constraint and unit priority are being followed per the 2022 Fish Passage Plan (FPP). RTS dates are subject to change.

Adult Fish Passage Facilities

The McNary fisheries staff performed measured inspections of the adult fishways on November 11, 13 and 16. Video review of adult passage continues and will extend to February 28, 2023. Picketed leads will remain down through this time frame.

Fish Ladder Exits:

Yes	No	Location	Criteria	Measurements
	X	Oregon Exit	Head over weir 1.0’ to 1.3’	1.1’ to 1.4’
	X	Oregon Count Station Differential	0.0’ to 0.5’	0.2’ to 1.1’
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’	0.2’ to 0.3’

Comments: Debris loads were minimal to moderate near the Oregon exit and minimal to very light near the Washington exit. Most of the debris was residual and circulated from the powerhouse to the Oregon shore depending on the wind direction. The general maintenance staff cleaned both exits’ picketed leads as needed, including the weekend.

The two out of criteria points listed above at the Oregon exit was due to debris blockage of the picketed leads on November 11. The general maintenance staff was called in to clean the leads and the roving operator made set point adjustments as required.

At the Washington shore exit, debris blockage of the picketed leads was noted on November 17. The general maintenance staff was notified, and they immediately cleaned the leads.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Oregon Entrance Head Differential	1.0' – 2.0'	1.2' to 1.4'
X			NFEW2 Weir Depth	≥ 8.0'	8.3' to 8.5'
X			NFEW3 Weir Depth	≥ 8.0'	8.3' to 8.6'
X			South Oregon Entrance Head Differential	1.0' – 2.0'	1.2' to1.4'
X			SFEW1 Weir Depth	≥ 8.0'	8.0'
X			SFEW2 Weir Depth	≥ 8.0'	8.0'
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 2.1 fps.
X			Washington Entrance Head Differential	1.0' – 2.0'	1.5' to 1.6'
X			WFE2 Weir Depth	≥ 8.0'	9.8' to 9.9'
X			WFE3 Weir Depth	≥ 8.0'	9.0' to 9.1'

Comments: WFE3 still requires calibration, however, this will wait for the winter outage unless tailwater elevation drops and causes the weir to operate out of criteria. Currently, the weirs depth is being estimated and appears to be in criterion. Calibrating the weir would require it to be removed from service.

There are four floating orifice gate (FOG) slots that still require future gate replacement. Slots W37 and W 41 remain closed. Ten of 12 slots are open. Eight gates are new or rehabilitated. Two gates are old.

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			23°	Oregon Ladder Fish Pump 1
		Yes		Oregon Ladder Fish Pump 2 RTS date is Jan. 31, 2023
Yes			23°	Oregon Ladder Fish Pump 3
Yes				OR North Powerhouse Pool supply from juvenile fishway

Comments: Fish pump 2 remains out of service and stator repairs continued. The current return to service date is January 31, 2023.

Juvenile Fish Passage Facility

The fall primary bypass season and maintenance continues. The separator and facility remain dewatered.

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: Debris loads were minimal to moderate near the powerhouse. Wind direction changes moved the residual debris across the forebay from the powerhouse to the Oregon shore and back. Debris loads beside the spillway and new debris loads were minimal. Much of the debris was woody material and aquatic vegetation.

No trash racks were cleaned. A very minimal amount of oil was removed from 9B slot with absorbent pads on November 14.

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 are installed in all units. ESBS camera inspections occurred in units 10, 11 and 12 on November 15. No issues were found.

Daily VBS differential monitoring revealed no high differentials this week and no screens were cleaned.

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: There was a small amount of moisture in the temporary and permanent air supply lines this week. The permanent line was returned to service on November 14. With unit 9 out of service, those orifices remain closed in order ensure the facility remains dewatered for further winter maintenance.

Area lighting was repaired, and one electrical outlet was replaced this week. Due to low debris loads, the brush cycle sequence was increased to every six hours on November 14.

Bypass Facility:

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

Comments: Winter maintenance continues. The facility is fully dewatered.

Top Spillway Weir (TSW) Operations: Spillbay 19 currently has a standard spillgate installed. The TSW is installed in bay 20 and was being opened per the fall season adult fallback schedule, which concluded on November 15.

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
138.5	115.5	1.8	0.0	53.0	50.0	6.0	6.0

Comments: The above data is provided by the control room. The data day runs from 0000 to 0000 hours. The above spill is due to TSW use.

Crane 7 remains in service. Electrical work on crane 6 continues. With limited crane use and hoist issues, a crane is required in order to move the gates in bays 2, 6, 16 and 21. The hoist for bay 6 is still out of service until February 2023 at the earliest. Only portion of the parts have arrived on project. The hoist with the broken coupler is scheduled to be repaired by January 3, 2023.

Other

Inline Cooling Water Strainers: The next cooling water strainer inspections will occur on December 6.

Avian Activity: Casual avian observations while doing other work continue.

For the outfall, the LRAD has been in place. More sounds were programmed and installed on November 12. However, the hazing effect was short lived. Parts for the laser have been ordered.

There are no other forms of hazing occurring at this time.

In the spillway zone, gulls and cormorants were roosting on structure or on the water unless the TSW was open, which encouraged the gulls to feed. Bird numbers fluctuated with the juvenile shad outmigration, though gull and cormorant numbers (300 and 150, respectively) were high at times in the tailwater area. A few mergansers and one great blue heron were also observed.

In the powerhouse zone, gull numbers fluctuated, with the birds roosting and/or feeding fairly regularly. A few cormorants were noted feeding too.

In the bypass outfall zone, gull numbers fluctuated, and cormorant numbers were stable at a fairly high number. Most of the birds were roosting but feeding at the outfall occurred fairly regularly.

In the forebay zone, a few gulls, or a gull flock were observed along with grebes (100 was the highest count). Also, nine loons and a few cormorants were noted. Outside the zone, large gull flocks, a few cormorants, and one great blue heron were noted. Most birds were roosting.

Invasive Species: The next mussel station examinations will occur on November 20.

Siberian Prawn: No Siberian prawns were observed this year.

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

Research: The Oregon Department of Fish and Wildlife continued their TSW adult fallback study up to the TSW closure date, November 15. They will resume their project on March 1, 2023.

Project: Ice Harbor
Fisheries Biologist: Ken Fone

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)

	OOS		RTS		
Unit	Date	Time	Date	Time	Outage Description
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind

Comments: Units 6, 5, 2, and 1 were taken out of service one at a time for submersible traveling screen (STS)/vertical barrier screen (VBS) inspections on November 14 and 15.

Adult Fish Passage Facility

Ice Harbor staff inspected the adult fishways on November 14, 16, and 17.

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’	2.1’
x			South Shore Channel Velocity	1.5 – 4.0 fps	
x			North Powerhouse Entrance (NFE-2) Weir Depth	≥ 8.0’ or on sill	
x			North Powerhouse Entrance Channel/Tailwater Differential	1.0’ – 2.0’	
		x	North Shore Entrance (NEW-1) Weir Depth	≥ 8.0’ or on sill	
x			North Shore Channel/Tailwater Differential	1.0’ – 2.0’	

Comments: The south shore entrance channel/tailwater differential was slightly above criteria on November 14 because of lower tailwater levels. Five south shore auxiliary water supply (AWS) pumps have been operating, which are the minimum number of pumps needed to maintain at least 1.0’ of channel/tailwater differential at the north powerhouse entrance as well as maintain at least 1.0’ of depth over the stationary weirs that are just above tailwater level.

Auxiliary Water Supply System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply (AWS) 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: None.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
x			Forebay debris load acceptable? (amount)	Average of 13 square yards
x			Gatewell drawdown measured this week?	
x			Gatewell drawdown acceptable	
x			Any debris seen in gatewells (% coverage)	0-16% coverage
x			Any oil seen in gatewells?	5B slot

Comments: A light oil sheen was observed in gatewell slot 5B on November 14. The source of the oil was not definitively determined, but the sheen was most likely produced from a small quantity of hydraulic oil. Oil socks were already in 5B gatewell and head gate slots. An oil skimmer was re-deployed into the head gate slot. The appropriate state and federal agencies were notified of the oil spill.

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	VBS differentials checked this week?
		x	VBS differentials acceptable?

Comments: Unit 6, 2, and 1 STSs and unit 5 VBSs were inspected on November 14 and 15. There were no significant 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: 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.

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

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

Removable Spillway Weir (RSW): The RSW is periodically opened from September 1 to November 15 for the downstream passage of adult steelhead that may have strayed into the Snake River. The RSW is scheduled to be operated from 0500 hours to 0900 hours on Sundays, Wednesdays, and Fridays for that purpose.

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
22.2	14.9	1.7	0	55	52	10.0	7.0

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Unit 1, 2, and 6 cooling water strainers were cleaned of juvenile shad on November 14 and 17. A total of approximately 1,500 dead shad were removed.

Avian Activity: There were high numbers of mergansers, gulls, cormorants, and pelicans observed around the project. Most of the birds were observed foraging along the south shore downstream of the powerhouse, near the upstream tip of Eagle Island, in the tailrace of spillbay 2 when the RSW was open, and in the tailrace adjacent to the navigation lock when the lock was drained.

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

Fish Rescue/Salvage: None.

Research: A redd survey of the downstream approach to the navigation lock occurred on November 17. A repeat survey will occur in mid-December. The surveys are in preparation for maintenance dredging of the navigation lock approach, which is scheduled to occur in early 2023.

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)

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
Unit 1	10/25/2022	0707	1/26/2023	TBD	Annual

Comments: None.

Adult Fish Passage Facility

The adult fishways were inspected by Army Corps biologists November 14, 15 and 16.

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: The north side picketed leads were cleaned on November 12.

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	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: The south powerhouse entrance weir (SPE-1) and (SPE-2) was on sill during all inspections with readings of 6.9, 7.6 and 6.8 feet, respectively. The south shore entrance weir (SSE-1) was on sill during all inspections with readings of 8.0, 8.0 and 7.9 feet, respectively. The project has received the new staff gauges and the JFF is working with powerhouse staff to arrange the installation.

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)	133 yds^2
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0 – 4%
	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: Installed STSs were running in Cycle-Run mode throughout this reporting period.

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 brush in the PDS is no longer in automatic mode due to the small amount of debris coming into the channel. The brush is now run manually Monday and Thursday in the afternoon.

Collection Facility: The collection season ended on October 1. Winter maintenance of the facility continues. The holes in the wet lab floor were filled in this week with cement. Weeds and brush were removed from inside the outfall pipe fence.

Transport Summary: No transport is occurring currently due to winter maintenance.

Spillway: Fall spill for steelhead 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
21.0	14.0	1.6	0.0	53.0	51.5	5.9	5.5

* Scrollcase temperatures are used for water temperatures. Due to Unit 1 being OOS, temperatures are currently being read from Unit 2.

Other

Cooling Water Strainers: Cooling water strainers inspections will occur again in December. Monitoring is performed from December to June.

Avian Activity: Only general observations occurred this week with ladder inspections. Gulls and cormorants were observed roosting around the forebay and on the navigation lock guidewall. Approximately 50 Western Grebes were observed roosting and foraging in the tailwater area on November 17.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on November 15.

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

Research: No research is occurring currently.

Project: Little Goose
Biologists: 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)

	OOS		RTS		
Unit	Date	Time	Date	Time	Outage Description
1	10/17/2022	1530	11/18/2022	ERTS	Turbine oil leak, unit annual
2	11/07/2022	0900	11/11/2022	1340	BPA substation work outage
3	11/07/2022	0900	11/11/2022	1340	BPA substation work outage
4	11/07/2022	0900	11/11/2022	1340	BPA substation work outage – station service
5	4/14/2017	14:11	12/31/2022	ERTS	Spider and upper guide bearing repair.
6	4/18/2022	5:10	12/31/2022	ERTS	Rooftop/BUS work replacement; 6-year overhaul

Comments: Previously reported Unit 6 RTS date of 4/21/2022 pertained to station service only, the anticipated RTS for regular service is 12/31/2022. Unit 1 was forced out of service for a turbine oil leak. Repairs will be combined with the unit annual maintenance. Unit 4 operating for station service only during the BPA work (MOC 22 LGS 08).

Adult Fish Passage Facility

USACE staff inspected the adult Fishway on November 14, 15, and November 16.

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			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 was returned to service on February 8 with AWS pumps returning to service on February 24. The NSE channel/tailwater differential and NSE weir depths were manually measured, adjusted, and monitored into criteria from February 24 through March 1. The fishway Fish System Control (FSC) was recommissioned on May 5 with NSE weir reading anomalies. NSE weirs 1 and 2 are being monitored with manual measurements as both weir targets enabling the FSC system to accurately read and automatically adjust weir heights were compromised during emergency flood control measures in June, repairs are pending. The Fish Ladder Exit Cooling Water Pump was replaced, installed, and readied for service on April 23. Criteria requiring the activation of the Fish Ladder Exit Cooling Pump was met during the night hours of June 26, and the system was started at 0800 hours on June 27. The Fish Ladder Exit Cooling Pump met criteria and was turned off at 1700 hours on September 30. The Collection Channel Surface Velocity is measured at NPE.

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, 2, and 3 were returned to service February 24.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comment
X			Forebay debris load acceptable? (amount)	High 76 ft² - Low 5 ft²
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	1 % in 1B, 2C, 3C on 11/14
	X		Any oil seen in gatewells?	

Comments: The forebay had minimal floating debris inside the trash shear boom with the highest measurement occurring on November 15. Draw down differential measurements were completed November 15 on units 2 and 3.

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 ESBS's began March 21 with most units completed on March 22. Units 6 and 1 ESBS and VBS undergoing work during scheduled maintenance periods.

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 watered up March 23.

Collection Facility: The juvenile collection facility completed water up activities on March 29. Every other day collection for condition monitoring in conjunction with secondary bypass commenced on April 1 with the first sample being conducted on April 2. Everyday collection began April 23 coinciding with every other day barge transportation. Collection ended for the season with the final sample of November 1.

Transport Summary: Collection for fish transportation began April 23 with the first barge departure on April 24. Every other day barging transitioned to everyday barging on May 16 due to an increase in fish numbers. Every other day barging resumed on May 24. Barge transportation for the season ended with the final barge departure of June 19. Collection for truck transport operations began on August 1 with the first truck departure on August 3 and concluded with the final truck departure of November 1.

Spillway Weir: Little Goose began operation of the adjustable spillway weir (ASW) on March 2 to facilitate passage of adult steelhead overshoots. Operation occurred three days each week on non-consecutive days for four hours in the morning on Tuesday, Thursday, and Sunday each week through March 31. Spring spill operations began as scheduled on April 3 with the ASW in high crest. The ASW was positioned in low crest on May 28. Summer spill operations began as scheduled on June 21, and the ASW was repositioned into high crest on June 28. The ASW was closed for the spill season at 10:00 on August 1. Summer spill concluded for the season at 2357 hours on August 31. Surface spill to facilitate downstream passage of pre-spawn adult steelhead as natal stream overshoots commenced at 0500 hours on September 1. The ASW was positioned at an elevation of 639 feet and is scheduled to spill from 0500 hours through 0900 hours every Tuesday, Thursday, and Sunday through the month of October, with an anticipated slight schedule change to occur early November. Final ASW steelhead natal stream overshoot spill ended at 0900 on November 15.

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
23.8	13.7	6.0	0.0	52.1	51.3	6.0	5.7

*Ladder temperature.

Other

Inline Cooling Water Strainers: Inline cooling strainer inspections commenced on December 9, 2021. 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 began April 1 with hazing beginning on March 29 and ended June 18. Daily bird counts ended for the season with the November 1 count as reported in the previous reporting period.

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 were 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): The last GBT monitoring event occurred August 24.

Fish Rescue/Salvage: Neither fish rescue nor salvage activities took place during this report period.

Research: The Nez Perce Tribe (NPT) began adult steelhead kelt collection efforts on April 1 and concluded June 29.

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)

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
1-6	11/14	0801			500 KV Line 1 Outage
2	10/31	0714			Annual Maintenance

Comments: ESBSs in Units 1-4 and 6 were removed November 14-17. Unit 5 ESBSs will be removed November 23. The powerhouse 500kV line work was completed November 14-17 (MOC 22 LWG 08). Unit 5 was operated for station service poser during the lineout age.

Adult Fish Passage Facility

Lower Granite Biologists and Anchor QEA staff inspected the adult fishway on November 12, 14, 15, and 16.

Fish Ladder:

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

Comments: Ladder temperature data can be found at https://www.nwd-wc.usace.army.mil/dd/common/dataquery/www/.

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
	X		South Shore Entrance (SSE-1) Weir Depth	≥ 8.0’	7.9’
	X		South Shore Entrance (SSE-2) Weir Depth	≥ 8.0’	7.9’
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	≥ 8.0’ or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	≥ 8.0’ or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
X			North Shore Entrance (NSE-1) Weir Depth	≥ 7.0’ or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	≥ 7.0’ or on sill	
	X		North Shore Channel/Tailwater Differential	1.0’–2.0’	0.9’, 0.6’, 0.9’, 0.8’
X			Collection Channel Surface Velocity	1.5 – 4.0 fps	

Comments: The fish ladder control system continues to be evaluated to resolve ongoing issues. FOGs 1, 4, 7, and 10 are in operation. Although both NSEs and all four FOGs are in operation, the north shore has not consistently met channel/tailwater head differential criteria this season.

Auxiliary Water Supply System:

Operating Satisfactorily	Standby	Out of Service	Auxiliary Water Supply (AWS)
	X		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)	33.7 yds^2
X			Trash rack differentials measured this week?	
X			Trash rack differentials acceptable	
	X		Any debris seen in gatewells (% coverage)	
	X		Any oil seen in gatewells?	

Comments: None.

ESBSs/VBSs:

Yes	No	NA	Item
		X	ESBSs deployed in all slots and in service?
		X	ESBSs inspected this week?
		X	ESBSs inspection results acceptable?
X			VBSs differentials checked this week?
X			VBSs differentials acceptable?

Comments: None.

Orifices, Collection Channel, Dewatering Structure, Bypass Pipe:

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

Comments: None.

Collection Facility: Dewatered for winter maintenance.

Transport Summary: No transport.

Spillway Weir: There were 16 wild PIT-tagged steelhead fallbacks at LWG this report week with 11 detected at the RSW and 5 detected in the JBS full flow array. Fourteen of the 16 wild steelhead fallbacks were tagged and released from the LWG adult trap August 18-November 15.

There were 106,714 juvenile and 262 PIT-tagged adult Chinook salmon, 72,884 juvenile and 644 adult PIT-tagged steelhead, 10,826 juvenile and 4 adult sockeye salmon, and 4,064 juvenile and 9 adult coho salmon detected over the RSW spillway since March 1. There have been 39,631 juvenile and 55 adult Chinook salmon, 28,754 juvenile and 180 adult steelhead, 2,124 juvenile and 1 adult sockeye salmon, and 951 juvenile and 4 adult coho salmon detected at the JBS full flow PIT tag detection array since March 14 (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
19.9	16.6	9.5	0.0	49.5	46.0	5.0	5.0

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: N/A

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

Avian Activity: N/A

Gas Bubble Trauma (GBT) Monitoring: N/A

Adult Fish Trap Operations: Trap operations ended with the last fish sample at 1400 hours November 15. The sample gates were turned off, the attraction pool supply valve was closed, and the turnpool gate was positioned to ladder passage position after the sample. The adult trap was dewatered and winterized November 17.

Fish Rescue/Salvage: Adult trap return ladder and attraction pool were cleared of fish on November 17. Fish rescued from the attraction pool were returned to the adult ladder and the fish from the return ladder were flushed to the tailrace through the drain.

Research:

National Marine Fisheries Service (NMFS) PIT tagging of Adult Wild Chinook salmon and Adult Steelhead for ISEMP-Related Dispersal Monitoring:

The goal of this project is to PIT tag up to 4,000 unclipped adult Chinook salmon and 4,000 unclipped adult steelhead collected in the adult trap daily sample for dispersal monitoring.

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. Data collection includes fish scales, genetics tissue, sex and length, wild/hatchery composition, and non-adipose clipped hatchery fish assessment. All natural origin adult steelhead and spring/summer Chinook salmon trapped will be PIT tagged to estimate headwater tributary escapement. Sockeye Salmon may be PIT tagged in the future to estimate metrics regarding conversion rates. Some steelhead and spring/summer Chinook salmon may be radio-tagged or spaghetti-tagged. This information on adult fish forms the basis for status information used in several forums including BiOp-RPA identified needs.

PIT Tagging and Genetic Sample Collection from Bull Trout for USFWS:

Bull trout will be collected as part of the normal adult trap daily sample and using the adult SbyC system to recapture previously PIT tagged fish. Untagged bull trout will be PIT tagged, fin clipped for genetic analysis, and have morphometric data collected including weight and length etc. Fin clips will be sent to USFWS to determine the fish's origin. Previously PIT tagged bull trout will only have morphometric data collected. All fish will be released back into the adult fish ladder.