U.S. ARMY CORPS OF ENGINEERS
WALLA WALLA DISTRICT
FISH FACILITIES WEEKLY REPORT
#06-2021
April 02-08, 2021

Project: McNary
Biologist: Bobby Johnson and Denise Griffith

Turbine Operation

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

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

	OOS		RTS		
Unit(s)	**Date**	**Time**	**Date**	**Time**	**Outage Description**
5	12/7	0643	5/30	N/A	Thrust bearing upgrades/Blade seals
1 & 2	4/5	0644	4/6	1504	Transformer T1 work/Unit 2 ESBS's
3	4/5	1128	4/5	1657	ESBS's installed
4	4/6	0630	4/6	1129	ESBS's installed
6	4/6	1133	4/6	1556	ESBS's installed
7	4/7	0630	4/7	1111	ESBS's installed
8	4/7	1115	4/7	1559	ESBS's installed
9	4/8	0630	4/8	1057	ESBS's installed
11	4/8	1059	4/8	1603	ESBS's installed

Comments: The soft one percent peak efficiency constraint continues per the 2021 Fish Passage Plan (FPP) page MCN-27. Also, unit priority is being followed per the FPP. RTS dates are subject to change.

Adult Fish Passage Facilities

McNary fisheries biologists performed measured inspections of the adult fishways on April 4, 6 and 8. Fish counting continues.

Fish Ladder Exits:

Yes	No	Location	Criteria	Measurements
X		Oregon Exit	Head over weir 1.0' to 1.3'	1.1' to 1.2'
X		Oregon Count Station Differential	0.0' to 0.5'	0.2'
X		Washington Exit	Head over weir 1.0' to 1.3'	1.1' to 1.2'
X		Washington Count Station Differential	0.0' to 0.5'	0.2' to 0.3'

Comments: Debris loads were minimal near both exits.

There are no problems to report.

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Oregon Entrance Head Differential	1.0' – 2.0'	1.5' to 1.6'
X			NFEW2 Weir Depth	≥ 8.0'	8.1' to 8.2'
X			NFEW3 Weir Depth	≥ 8.0'	8.1' to 8.3'
X			South Oregon Entrance Head Differential	1.0' – 2.0'	1.5' to 1.7'
X			SFEW1 Weir Depth	≥ 8.0'	8.1' to 8.2'
X			SFEW2 Weir Depth	≥ 8.0'	8.2' to 8.3'
X			Oregon Collection Channel Velocities	1.5 to 4.0 fps	Averaged 1.5 fps
X			Washington Entrance Head Differential	1.0' – 2.0'	1.3'
X			WFE2 Weir Depth	≥ 8.0'	10.0' to 10.2'
X			WFE3 Weir Depth	≥ 8.0'	10.1' to 10.3'

Comments: Though not during an inspection, Oregon entrance SEFW2 was found with slack cables and out of criterion again on April 5. The weir was jammed shallow and the roving operator reset it.

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			20° to 22°	Oregon Ladder Fish Pump 1
Yes			20° to 22°	Oregon Ladder Fish Pump 2
Yes			20° to 22°	Oregon Ladder Fish Pump 3
Yes				OR North Powerhouse Pool supply from juvenile fishway

Comments: To adjust SFEW2 as mentioned above, the operator had to briefly reduce all three fish pumps' blade angles to zero degrees on April 5.

Juvenile Fish Passage Facility

Normal sampling season, consisting of alternating days of primary and secondary bypass, began on April 2. The first sample examination occurred on April 3. There was no interruption in the sampling schedule this week.

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	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 moderate near the powerhouse and minimal beside the spillway. New debris loads were minimal. The debris consisted mostly of woody material.

The next round of trash rack cleaning is scheduled for late April.

A few large woody debris pieces were removed from the gatewell slots this week.

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 installed in units 2 through 4, 6 through 9 and 11 this week. ESBS will be installed in unit 12 on April 12, at which time all screens will be in place except unit 5, which is OOS. The next camera inspections will be in units 13 and 14 on April 13.

Unit 3's ESBS's currently cannot be controlled or communicated with from the control room. The electrical staff is working on the issue. The screens can be monitor in the powerhouse 8th floor gallery. The biologist noted the brushes on the screens in 3A and 3B slots were not fully cycling at times from April 6 to 8. However, enough brush cycles are being completed to keep the ESBS clean. Also, for the most part, the unit has been in standby.

Daily VBS differential monitoring revealed no issues.

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: Orifice operators were repaired as needed.

All systems operated satisfactorily. The screen cleaning brushes cycle sequence was increased to every six hours on April 2.

It was noted the hoist system trolley had an oil leak this week. The trolly will be repaired as soon as parts arrive on project.

Bypass Facility:

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

Comments: With the start of the sampling season, all bypass facility systems returned to service on April 2 at 0700 hours. Area and walkway lighting bulbs were replaced.

There was difficulty lowering the gates between the sample tanks and anesthesia chambers on April 3. Two smolts were inadvertently crushed under the gates. An alternative crowding technic was developed, and the gate issue was resolved on April 5. One juvenile lamprey mortality occurred under the primary/secondary bypass gate.

This week, 64 juvenile lamprey and 5,093 smolts were bypassed during secondary bypass. The smolt monitoring staff reports fish data in a separate report.

Top Spillway Weir (TSW) Operations: The TSW in bay 19 remains closed until April 10 at 0001 hours. Crane 7 will be attached to the TSW in bay 19. This set up was tested on April 6. The TSW in bay 20 is being used for the adult steelhead TSW passage efficiency study and as required by the Biological Opinion until the morning of April 9. The TSW will be opened per the study plan until spill season begins. The TSW in bay 20 is attached to a hoist.

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
135.2	116.7	1.4	0.0	47.8	46.3	6.0	6.0

Comments: The above data is provided by the smolt monitoring staff except water clarity, which comes from the control room. The data day runs from 0700 to 0700 hours. The spill recorded is due to the TSW study. Repairs to cranes 6 are scheduled to be completed in late May or early June. The spring spill program begins on April 10 at 0001 hours. The spillway program was upgraded this week. Since crane 6 is not available, crane 7 will be used to open bay 2, which will be dogged at four feet, on April 10.

Other

Inline Cooling Water Strainers: The cooling water strainer inspections revealed a total of five juvenile lamprey mortalities on April 6.

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

Table 3. McNary Project's Daily Avian Count.

Date	Zone	Gull	Cormorant	Tern	Pelican	Grebe
April 2	Spill	0	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	1	16	0	0	0
	Forebay	0	0	0	0	0
April 3	Spill	1	0	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	1	28	0	0	0
	Forebay	1	0	0	0	0
April 4	Spill	1	0	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	1	41	0	0	0
	Forebay	0	0	0	0	0
April 5	Spill	3	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	4	31	0	0	0
	Forebay	0	0	0	0	0
April 6	Spill	0	0	0	0	0
	Powerhouse	0	0	0	0	0
	Outfall	3	29	0	0	0
	Forebay	0	0	0	0	0
April 7	Spill	4	0	0	1	0
	Powerhouse	0	0	0	0	0
	Outfall	7	20	0	0	0
	Forebay	0	0	0	0	0
April 8	Spill	5	1	0	2	0
	Powerhouse	3	0	0	0	0
	Outfall	5	36	0	0	0
	Forebay	0	0	0	0	0

The laser on the outfall pipe remains out of service due to a faulty emergency stop button. The button is scheduled to be replaced next week. The navigation lock wing wall laser's program include at downstream pattern unknown to the fisheries staff. This pattern flashed a tugboat captain on April 4. The laser was removed from service the morning of April 5. After this pattern was removed, the laser returned to service on April 8. However, the biologist still has concern about how well the laser is patterning.

Two large bird distress calls remain installed on the navigation lock wing wall.

In the spillway zone, gulls, pelicans, and a cormorant were occasionally observed. Gulls were noted near the TSW flow when it was open. It is assumed the pelicans and cormorant were feeding. One bald eagle, which appeared to disturb the other birds, was observed.

In the powerhouse zone, the gulls appeared to be just passing through.

In the bypass outfall zone, a small number of gulls were observed. They were mostly roosting except feeding did occur when the wing wall laser was off. Cormorants were noted roosting on the juvenile bypass outfall pipe as they had done all winter. However, as the week past and with the wing wall laser outage, more cormorants were feeding.

In the forebay zone, one gull was observed. However, outside the zone, gulls appeared to begin to be staging as numbers slowly increased during the week. A loon, one tern, a cormorant, two pelicans and four ospreys were also noted at the edges of the zone. No grebes were observed on project.

Invasive Species: The next mussel station examinations will occur in late April.

Siberian Prawn: No Siberian prawns were removed or euthanized this week.

Fish Rescue/Salvage: There is nothing to report.

Research: The spring phase of the Pacific Northwest National Laboratory (PNNL) adult steelhead TSW passage efficiency study will conclude the morning of April 9. That afternoon, the cameras near the TSW in bay 20 will be removed.

The first gas bubble trauma examinations will occur on April 12.

Project: Ice Harbor
Fisheries Tech: Tim DeKoster
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).	**Hard**	**Soft**
x		Available turbines operated within 1% peak efficiency? Constraint in effect.	x	

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

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
3	5/3/19	0641	---	---	Turbine runner replacement and stator rewind
2	4/7/21	0722	4/7/21	1500	Index testing

Comments: Unit 2 was operated under various loads, including below the 1% operating efficiency range, for index testing on April 7. See MOC 21 IHR 04 for more information about the testing.

Adult Fish Passage Facility

Ice Harbor fish facility staff inspected the adult fishways on April 5, 6, 7.

Fish Ladders:

Yes	No	Location	Criteria	Measurements
x		North Ladder Exit Differential	Head ≤ 0.3’	
x		North Ladder Picketed Lead Differential	Head ≤ 0.3’	
x		North Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	
x		South Ladder Exit Differential	Head ≤ 0.3’	
x		South Ladder Picketed Lead Differential	Head ≤ 0.3’	
x		South Ladder Depth over Weirs	Head over weir 1.0’ to 1.3’	

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
x			South Shore Entrance (SFE-1) Weir Depth	≥ 8.0’ or on sill	
x			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	
	x		South Shore Channel Velocity	1.5 – 4.0 fps	1.4
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	6.6
x			North Shore Channel/Tailwater Differential	1.0’ – 2.0’	

Comments: The north shore entrance weir depth was below criteria on April 5 when the weir was slightly off sill. The powerhouse operator was informed, and he lowered NEW-1 weir down to sill.

The south shore channel velocity was slightly below criteria on April 6. On April 6, a sixth south shore auxiliary water supply pump was turned on to increase the velocity.

Auxiliary Water Supply (AWS) System:

Operating Satisfactory	Standby	Out of Service	Auxiliary Water Supply System (AWS)
5-6 pumps	1-3 pumps	0-1 pump	Status of the 8 south shore AWS pumps
2 pumps	1 pump		Status of the 3 north shore AWS pumps

Comments: South shore AWS pump #8 has been out of service since March 1 to replace worn seals in the lower gearbox. The pump was returned to service on April 5 at 1000 hours. South shore AWS pump #7 was taken out of service on April 7 at 1505 hours to replace the lower gearbox shaft seal.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

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

Comments: None.

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

Yes	No	NA	Item
x			STSs deployed in all slots that are in service?
x	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: STSs were switched to continuous-run mode on April 1 due to the presence of small juvenile sockeye in the fish sample. The sockeye were later classified as kokanee by the Fish Passage Center, so the STSs were switched back to cycle-run on April 5.

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: Orifices are being backflushed three times per day. There were no debris obstructions observed at the orifices, as indicated by reduced flow through the orifices. There was no significant debris that came into the separator when the orifices were being backflushed.

The actuator for the water regulating weirs was found to be without power on April 1. Electricians determined that the actuator is failing and is tripping the disconnect. A spare actuator was installed in its place on April 7. Unfortunately, the replacement actuator cannot be operated automatically because it does not have an analog controller input. A determination will be made whether this feature can be added to the actuator. In the meantime,

the water level in the collection channel is being visually monitored three times per day and the actuator will be operated electronically in "local" control to adjust the weirs as needed.

Juvenile Fish Facility: The Juvenile Fish Facility is operating in primary bypass mode except when collecting sample fish.

Fish Sampling: Fish condition sampling is occurring on Mondays and Thursdays each week. See the table below for a summary of the sampling results. The one mortality in the April 5 sample appeared to have already been dead for at least a day before coming into the facility.

Fish condition sampling results at Ice Harbor Dam:

Date: April 5

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	86	0	1	0
Chinook yearling unclipped	9	0	0	0
Chinook subyearling clipped	0	---	---	---
Chinook subyearling unclipped	0	---	---	---
Steelhead clipped	1	0	0	0
Steelhead unclipped	1	0	0	0
Sockeye clipped	0	---	---	---
Sockeye unclipped	0	---	---	---
Coho clipped	0	---	---	---
Coho unclipped	0	---	---	---
Total	97	0	1	0

Date: April 8

Species, Run, Rear type	Sampled	#Descaled	Morts	Avian Marks
Chinook yearling clipped	103	0	0	0
Chinook yearling unclipped	3	0	0	0
Chinook subyearling clipped	0	---	---	---
Chinook subyearling unclipped	0	---	---	---
Steelhead clipped	5	0	0	1
Steelhead unclipped	0	---	---	---
Sockeye clipped	0	---	---	---
Sockeye unclipped	0	---	---	---
Coho clipped	0	---	---	---
Coho unclipped	0	---	---	---
Total	111	0	0	1

Removable Spillway Weir (RSW): Voluntary spring spill for fish passage began on April 3 at 0001 hours.

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
60.9	52.2	39.4	0.3	46	46	6.0	6.0

*Unit 1 scroll case temperature.

Other

Inline Cooling Water Strainers: Turbine cooling water strainer inspections occurred on April 8 for units 1, 2, 4, 5, and 6. A total of 1 juvenile clipped chinook and 5 juvenile lamprey (all mortalities) were found.

Avian Activity: There were low numbers of piscivorous birds observed around the project (see table below). Land-based hazing of piscivorous birds for 8 hours per day began on April 1 and changed to 16 hours per day on April 4. Boat-based hazing for 8 hours per day, 3 days per week, began on April 4. Bird hazing has been effective at dispersing birds away from the dam.

Daily maximum piscivorous bird counts at Ice Harbor Dam.

Date	Gulls	Cormorants	Caspian Terns	Grebes	Pelicans
April 2	0	0	0	0	2
April 3	0	5	0	0	5
April 4	0	0	0	0	6
April 5	17	1	0	0	0
April 6	0	1	0	0	1
April 7	0	0	0	0	0
April 8	1	3	0	0	0

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. Daily and total Siberian prawn counts at Ice Harbor Dam for this reporting period are shown below.

Number of Siberian prawns in the sample at Ice Harbor Dam.

Date	Sample (euthanized)	Collection*
April 5	2	2
April 8	1	1
Totals	3	3

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

Fish Rescue/Salvage: Unwatering activities that involved fish rescue did not occur this week.

Research: No on-site research is occurring at this time.

Project: Little Goose
Biologists: Scott St. John

Turbine Operation

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

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

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
5	04/14/17	14:11	03/31/2022	17:00	Spider and upper guide bearing repair.
6	03/18/21	14:17	03/31/2022	17:00	T2 ground
1	11/30/20	08:00	04/16/2021	17:00	6-year overhaul
All	04/06/21	11:54	04/06/21	17:25	Line outage for T2

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 conducted. A line outage was conducted to hang grounds on T2 to facilitate inspections and begin replacement (MOC 21 LGS 03).

Adult Fish Passage Facility

Little Goose fish facility and Environmental Assessment Services (EAS) staff inspected the adult fishway on April 4, 7, and April 8.

Fish Ladder:

Yes	No	NA	Location	Criteria	Measurements
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 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	≥ 8.0’	6.4
	X		South Shore Entrance (SSE-2) Weir Depth	≥ 8.0’	6.4
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	
		X	North Powerhouse Entrance (NPE-1) Weir Depth	≥ 7.0’ or on sill	
		X	North Powerhouse Entrance (NPE-2) Weir Depth	≥ 7.0’ or on sill	
X			North Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
	X		North Shore Entrance (NSE-1) Weir Depth	≥ 6.0’ or on sill	3.4, 4.7, 5.5
	X		North Shore Entrance (NSE-2) Weir Depth	≥ 6.0’ or on sill	3.4 ,4.7, 5.5
	X		North Shore Channel/Tailwater Differential	1.0’–2.0’	2.3
	X		Collection Channel Surface Velocity	1.5 – 4.0 fps	1.3

Comments: The adult fishway continues to operate in manual mode. Project staff have struggled to maintain entrance criteria during spring spill. The fish control system still has a faulty hydroranger for the NSE1 weir and is currently awaiting parts. The adult fishway AWS pump 3 returned to service on April 07. The SSE weir depth were found out of criteria on April 4, NSE weir depth was found out of criteria April 4, 7, and 8. The NSE channel to

tailwater differential was found out of criteria on the April 4 inspection. Subsurface water velocity was measured on March 17 at NPE and averaged 1.8 fps.

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 07.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comment
X			Forebay debris load acceptable? (amount)	
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	5%
X			Any oil seen in gatewells?	

Comments: There is approximately 60,000 square feet of floating woody debris currently inside the trash shear boom in the forebay. Little Goose continues efforts to conduct spill operations to remove forebay debris through the ASW (MOC 21 LGS 01), with some success. Oil was observed leaking from the ESBS screen cleaning gearbox into gatewell 5B on April 6. The orifices were closed, and cleanup and reporting efforts initiated immediately. Gatewell drawdowns were conducted on April 7 for Unit 2 and were in criteria.

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. VBS differentials were conducted on April 7 for Unit 2 and were in criteria.

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 on March 22 and is currently alternating between primary bypass and secondary bypass to facilitate collection for condition monitoring.

Collection Facility: Collection for condition monitoring in conjunction with secondary bypass commenced on April 1 with the first sample being conducted on April 2. The juvenile fish facility is alternating to primary bypass on non-collection days. The collection and transport facility operated within criteria this report period. A total of 1,500

fish were collected, of which 1,499 were bypassed back to the river. The descaling and mortality rates were 1.4% and 0.05%, respectively. No adult lamprey were removed from the separator this report period.

Transport Summary: Fish transportation is scheduled to begin on April 24.

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 through March 30, with an additional makeup day on April 1 (MFR 21 LGS 04). Spring spill operations began April 3.

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
53.8	49.2	33.3	0.0	47.7	46.0	4.1	3.8

*Ladder temperature.

Other

Inline Cooling Water Strainers: Inline cooling strainer inspections commenced on January 13. Inspections will continue in accordance to the Fish Passage Plan (FPP) and results will be submitted to the District.

Avian Activity: Daily piscivorous bird counts at Little Goose Dam began on April 1. USDA hazing actives began on March 29.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
4-2	8:30	1	2	0	0
4-3	13:00	0	9	0	0
4-4	10:30	0	10	0	0
4-5	8:00	0	5	0	6
4-6	8:25	0	0	0	0
4-7	9:50	2	2	0	2
4-8	9:00	0	0	0	0

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 for this reporting period are reported below.

Date	Sample	Collection*
4-2	3	6
4-3	N/A	N/A
4-4	29	58
4-5	N/A	N/A
4-6	22	44
4-7	N/A	N/A
4-8	1	10
Totals	55	118

Gas Bubble Trauma (GBT): GBT monitoring was performed on April 5. Of the 12 fish examined, no signs of GBT were observed.

Fish Rescue/Salvage: No fish rescues occurred during this report period.

Research: No research activities occurred during this report period.

Project: Lower Monumental
Biologists: Chuck Barnes and Raymond Addis

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	

Comment: Hard constraint for turbine operating within 1% peak efficiency began on April 3.

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

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
Unit 2	7/15/2019	0720	9/02/2021	ERTS	Annual, Draft Tube Liner

Comments:

Adult Fish Passage Facility

The adult fishways were inspected by Corps and EAS/Anchor QEA biologists on April 2, 3, 4 and 7.

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:

Fishway Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Measurements
X			North Shore Entrance (NSE-1) Weir Depth	≥ 8.0’ or on sill	
X			North Shore Entrance (NSE-2) Weir Depth	≥ 8.0’ or on sill	
X			North Shore Channel/Tailwater Differential	1.0’–2.0’	
		X	South Powerhouse Entrance (SPE-1) Weir Depth	≥ 8.0’ or on sill	
		X	South Powerhouse Entrance (SPE-2) Weir Depth	≥ 8.0’ or on sill	
X			South Powerhouse Entrance Channel/Tailwater Differential	1.0’–2.0’	
X		X	South Shore Entrance (SSE-1) Weir Depth	≥ 8.0’	
X			South Shore Entrance (SSE-2) Weir Depth	≥ 6.0’	
X			South Shore Channel/Tailwater Differential	1.0’ – 2.0’	

Comments:
South Powerhouse Entrance (SPE-1) Weir was on sill during all inspections with readings of 7.4, 6.5, 6.6 and 6.4 feet respectively.
South Powerhouse Entrance (SPE-2) Weir was on sill during all inspections with readings of 7.4, 6.5, 6.6 and 6.4 feet respectively.
South Shore Entrance (SSE-1) Weir was on sill during the April 3, 4 and 7 inspections with readings of 6.5, 6.5 and 6.7 feet respectively.

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: Fish pumps returned to service at 1200 hours on February 25 after winter maintenance was completed.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	73 yds^2
X			Gatewell drawdown measured this week?	
X			Gatewell drawdown acceptable	
X			Any debris seen in gatewells (% coverage)	0-15%
	X		Any oil seen in gatewells?	

Comments:

STSs/VBSs:

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

Comments: The STS's are running in Cycle-run mode due to average sub-yearling Chinook and sockeye lengths being greater than 120 mm.

Orifices, Collection Channel, Dewatering Structure, and Flume:

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

Comments:

Collection Facility: Collection for condition sampling occurred from 0700 to 0700 on April 1 - 2, 4 – 5 and 7 - 8. A total of 11,545 fish were collected with 11,543 fish being bypassed back to the river.

Transport Summary: No transport currently.

Spillway Weir: RSW went into service at 0001 on April 3 with the start of spring spill.

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
59.5	52.3	41.6	0.0	46.0	45.1	4.6	3.0

*Scrollcase temperatures.

Other

Inline Cooling Water Strainers: Cooling water strainers were inspected on April 8. No living fish were found. Mortalities included 6 juvenile lamprey, 1 Chinook salmon smolt and 1 steelhead smolt.

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

Date	Time	Gulls	Cormorants	Terns	Grebes	Pelicans
4/2/2020	1300	0	0	0	0	0
4/3/2020	1230	0	0	0	0	0
4/4/2020	1230	6	0	0	0	0
4/5/2020	1130	2	0	0	0	1
4/6/2020	1300	3	0	0	0	0
4/7/2020	1230	8	0	0	0	0
4/8/2020	1300	3	0	0	0	0

Comments: Bird hazing efforts by USDA personnel began on April 1.
Daily tailrace observations began on April 1.

Invasive Species: No zebra or quagga mussels were observed during monitoring station inspections on March 4.

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

Research: No research is occurring currently.

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).	**Hard**	**Soft**
X		Available turbines operated within 1% peak efficiency? Constraint in effect.	X	

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

	OOS		RTS		
Unit	**Date**	**Time**	**Date**	**Time**	**Outage Description**
6	03/01	0700	04/08	1332	DC and low voltage switchgear
5	04/01	0713	04/01	1339	Replace ESBS/VBS
3	04/07	1901	04/08	1036	Failed to build voltage

Comments: Unit 3 was forced out of service due to a failure to build voltage when brought online. Operations worked with the Electrical System Control expert and were able to return unit 3 to service. Event data from several different configurations was collected and will be sent out for further analysis to determine what triggered the problem.

Adult Fish Passage Facility

Lower Granite Biologists and Anchor QEA staff inspected the adult fishway April 2, 3, 5, and 8.

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: Operation of diffuser 14 will remain in manual for the season due to an issue with the elevation sensor.

Fish Ladder Entrances and Collection Channel:

Yes	No	Sill	Location	Criteria	Comments
X			South Shore Entrance (SSE-1) Weir Depth	≥ 8.0’	7.9, 7.9
X			South Shore Entrance (SSE-2) Weir Depth	≥ 8.0’	7.8, 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’	0.8, 0.5, 0.9
	X		North Shore Entrance (NSE-1) Weir Depth	≥ 7.0’ or on sill	6.9’
	X		North Shore Entrance (NSE-2) Weir Depth	≥ 7.0’ or on sill	6.8’
	X		North Shore Channel/Tailwater Differential	1.0’–2.0’	0.6’, 0.7’
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 differentials are

unable to be maintained withing the criteria range under current operation. The Project is working with hydraulic engineers to improve collection channel conditions and find a permanent solution to the ongoing channel/tailwater criteria discrepancies.

Auxiliary Water Supply System:

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

Comments: AWS pump 1 tripped offline at 0206 hours April 7 due to high thrust bearing temperatures. The mechanical crew determined AWS pump 1 thrust bearing failed and needed to be replaced. Repairs will take 2-3 weeks of direct work time to complete. AWS pump 1 was swapped with pump 3 and the ladder was returned to normal operation at 1600 hours April 7.

Juvenile Fish Passage Facility

Forebay Debris/Gatewell Debris/Oil:

Yes	No	NA	Item	Comments
X			Forebay debris load acceptable? (amount)	Weekly average 80 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:

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: The VBS in gatewell slot 6A has been replaced.

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:

Collection Facility: Sockeye/Kokanee continue to be considered incidental species and will not be included as part of the SMP sample until NOAA guidance changes. IDFG began sampling O. Nerka for genetic stock assessment to better understand their origin. LWG bio techs began collection for NOAA In River Survival Study April 6.

Transport Summary: No transport.

Spillway Weir: Overshoot spill ended March 30. Spring flex spill started at 0003 hours April 3. There were a total of 2242 PIT tagged juvenile fish detected over the RSW including 767 Chinook and 1475 steelhead compared to 635 detected in the juvenile system. A total of 68 adult PIT tagged steelhead have been detected at the RSW this season compared to 40 PIT tagged adult steelhead detected at the juvenile facility.

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
60.1	47.4	39.0	0.0	47.0	45.0	4.8	3.4

*Cooling water intake temperature.

Other

Inline Cooling Water Strainers: N/A

Invasive Species: No zebra/quagga muscles were detected on the trap substrate. There were no Siberian prawns collected in the condition sample.

Avian Activity: Biologist began daily piscivorous bird counts at Lower Granite Dam March 1. Bird hazing began April 1. Up to 14 American White Pelicans have been counted loafing on the island downstream of the dam.

Date	Time	Gulls	Cormorants	Caspian Terns	Pelicans
April 2	1226	5	5	0	0
April 3	1230	0	0	0	0
April 4	0824	4	3	0	0
April 5	1318	1	0	0	1
April 6	0945	1	0	0	0
April 7	1300	0	2	0	0
April 8	1020	4	10	0	0

Gas Bubble Trauma (GBT) Monitoring: GBT sampling started April 8 with 44 smotls sample and one showing rank 1 (1-5%) symptoms of GBT.

Adult Fish Trap Operations: The adult trap is in operation Monday through Friday at a 25% (18% /week) sample rate.

Fish Rescue/Salvage: N/A

Research:

Idaho Fish and Game (IDFG) Genetic Stock Identification

Fish collected as part of the Lower Granite juvenile condition sample are used to enumerate and characterize age composition and genetic stock profiles of naturally producing yearling chinook and juvenile steelhead. IDFG will sample Monday through Friday through mid-June with a goal of collecting 2,000-5,000 yearling chinook and juvenile steelhead genetic samples.

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

The goal of this project is to PIT tag up to 4000 unclipped adult Chinook and 4000 unclipped adult steelhead collected in the adult trap daily sample for dispersal monitoring.

Sampling of Steelhead, Chinook salmon, and Sockeye salmon by the Idaho Department of Fish and Game (IDFG) and NOAA Fisheries for Biological data collection.

Upriver migrating steelhead, spring/summer Chinook salmon, and sockeye salmon are collected from the adult trap beginning April 4 through December 15. The goal is to collect 5-20% of adult steelhead, spring/summer Chinook salmon, and sockeye salmon ascending the ladder April 4-December 15. Data collection includes fish scales, genetics tissue, sex and length, wild/hatchery composition, and non-adipose clipped hatchery fish assessment. All natural origin adult steelhead and spring/summer Chinook salmon trapped will be PIT tagged to estimate headwater tributary escapement. Sockeye salmon may be PIT tagged in the future to estimate metrics regarding conversion rates. Some steelhead and spring/summer Chinook salmon may be radio-tagged or spaghetti-tagged. This information on adult fish forms the basis for status information used in several forums including BiOp-RPA identified needs.

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

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

National Marine Fisheries Service (NMFS) In-River Survival:

NMFS PIT-tag Chinook and steelhead smolts for their Survival Study April through early June to compare smolt to adult returns of in-river migrating smolts to the smolt to adult returns of transported smolts. PIT-tagged fish are held for 24 hours before being bypassed to the LWG tailrace. Collection for this study occurred April 6 and 7. Fish tagged were released to the river the following day.

Idaho Fish and Game (IDFG) *O. nerka* Genetic Stock Identification

Substantial numbers of *Oncorhynchus nerka* were collected at the Lower Granite Dam juvenile fish facility (JFF) during March 2021. These fish are likely kokanee released from Dworshak Reservoir during drawdown spill. IDFG began collecting genetic samples from *O. nerka* collected at the LWG juvenile facility April 1 to determine if some of these fish may be the progeny of Columbia River sockeye that passed Lower Granite Dam over the past few years. Samples are taken from 10-15 individuals per day until a total of 100 samples are collected.