

# 2023 Fish Passage Plan

## Appendix A

### Special Project Operations & Studies

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## 1. INTRODUCTION

### 1.1. Purpose

This Appendix to the annual *Fish Passage Plan* (FPP) describes special project operations and studies planned to occur during the current year that may affect fish passage at the four Lower Snake River and four Lower Columbia River projects. All special operations and studies will be coordinated with the project and appropriate regional agencies. The Corps RCC will issue a teletype to authorize all necessary operational changes and provide guidance to project operators.

### 1.2. Schedule

All dates defined for special operations and studies are approximate and could shift earlier or later due to a variety of factors, including river flow, contractor schedules, equipment failures, or other real-time conditions. Some studies in this Appendix may not be implemented. Therefore, a final description of studies and outages/operations being conducted will be regionally coordinated prior to April 1 as part of the Corps' Anadromous Fish Evaluation Program (AFEP) via the Fish Facilities Design Review Workgroup (FFDRWG) and/or the Studies Review Workgroup (SRWG). The Action Agencies will coordinate all significant operational requests and/or schedule changes with fish agencies and tribes through the appropriate regional forum to inform the final decision.

### 1.3. Spill for Juvenile Fish Passage

Spring and summer spill operations for juvenile fish passage will be implemented as defined in the *Fish Operations Plan* (FOP; included in the FPP as **Appendix E**), or as otherwise coordinated in-season through TMT.

### 1.4. Navigation Lock Maintenance

Annual navigation lock outages are scheduled for routine maintenance and inspections, as well as non-routine work (e.g., gate cleaning, structural inspections and repairs, and equipment/machinery repair and replacement). In 2023, the outage schedule is as follows:

Project	Lock Outage
BON	March 4 - 18
TDA	March 4 - 18
JDA	March 4 - 18
MCN	March 4 - 18

Project	Lock Outage
IHR	March 4 - 25
LMN	March 4 - 18
LGS	March 4 - 25
LWG	March 4 - 25

## 1.5. Doble Testing<sup>1</sup>

The current year’s transformer outage schedule for Doble testing at lower Snake projects and Dworshak Dam is in **Table A-1**.

### 1.5.1. Lower Snake River Projects:

At the Lower Snake projects, Doble testing of transformers is required every three years to ensure they are functioning correctly and to identify issues that need repair. The testing must be conducted during warm, dry conditions (July–August) and requires an outage of the transformer and associated units. Testing is performed during already scheduled outages to the extent possible and timed to avoid or minimize impacts to fish. In years that Doble testing isn’t required, the project may still require an outage during the same timeframe to perform necessary transformer maintenance and repairs that were identified in previous Doble tests and inspections. For more information, see project-specific **sections 6-9** below.

### 1.5.2. Dworshak Dam:

At Dworshak Dam, required transformer maintenance and Doble testing occurs every two out of three years starting September 21. For more information on Dworshak maintenance and testing, see **Appendix I**.

**Table A-1. Doble Testing Schedule in 2023.<sup>a</sup>**

Project	Dates	Outage (Transformer & Units)	Notes <sup>b</sup>
IHR	July 18–22	TW3 & TW4 (Units 3, 4) all hours	Remaining available units (2, 5, 6) operated per FPP priority order.
LMN	July 24 – August 3	T1 (Units 1–4) all hours T2 (Units 5, 6) first/last day	On first and last day, all units OOS 0530–1800 with Unit 5 at speed no load (8 kcfs) for station service. During all other hours, T2 (Units 5 & 6) available and operated per FPP priority order.
LGS	July 31 – August 12	T1 (Units 1–4) all hours T2 (Units 5, 6) 0500-1700	During the daily T2 outage, Unit 6 or 5 (if available) will be operated at Speed-no-Load for station service. T2 RTS nightly and Unit 6 and Unit 5 (if available) operated per FPP priority order.
LWG	N/A	N/A	No Doble testing in 2023
DWR	Sep 25-28	T2 (Unit 1) all hours	

**a.** The lower Columbia projects (BON, TDA, JDA, MCN) perform Doble testing concurrent with outages for maintenance and do not have specific outages for Doble tests.

**b.** OOS = Out of Service (unavailable to operate); RTS = Return to Service (available to operate).

<sup>1</sup> “Doble test” is a common term referring to a power factor test of transformers to measure performance of electrical insulation. Doble is the name of a manufacturer of the test equipment.

## 2. BONNEVILLE DAM

### 2.1. BON Special Operations

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage and navigation lock maintenance.

#### 2.1.1. Powerhouse 2 Fish Guidance Efficiency (FGE) Program.

- a) Dates: Construction work is scheduled to occur December 2022 – November 2023.
- b) Description: The B2FGE Program PDT has contracted work to install concrete gatewell flow modification devices in place of the metal plates that were installed and then removed due to structural failure. Installation was completed in Unit 15 during 2021 and hydraulically tested in 2022. The remaining units are scheduled for construction with unit outages occurring one at a time in sequence while being efficient with Bonneville Dam’s regularly scheduled work such as annual overhauls and thrust collar bearing inspections. The goal is to keep unit outages in the spring to one at a time. Schedule updates will be provided to FPOM.
- c) Impacts to FPP Criteria: A MOC will be provided to FPOM in the event FPP violations are identified as result of scheduling and require coordination.

### 2.2. BON Studies

There are no studies planned at Bonneville Dam in 2023.

## 3. THE DALLES DAM

### 3.1. TDA Special Operations

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage and navigation lock maintenance.

### 3.2. TDA Studies

There are no studies planned at The Dalles Dam in 2023.

## 4. JOHN DAY DAM

### 4.1. JDA Special Operations

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage and navigation lock maintenance.

#### 4.1.1. Blalock Islands Operation

- a) Dates: April 10 – June 1 (or as feasible based on river flows).
- b) Description: As described in the 2020 CRS BA (page 2-57), the John Day reservoir will be held between elevation 264.5 feet and 266.5 feet (an average of 265.5 feet) from April 10 through June 1 (or as feasible based on river flows) to deter Caspian terns from nesting in the Blalock Islands Complex. The Action Agencies intend to begin increasing the forebay elevation prior to initiation of nesting by Caspian terns to avoid take of tern eggs; operations may begin earlier than April 10 (when the reservoir is typically operated between 262.0 to 266.5 feet). The operation may be adaptively managed due to changing run timing; however, the intent of the operation is to begin returning to reservoir elevations of 262.5–264.5 feet on June 1, but no later than June 15, which generally captures 95% of the annual juvenile steelhead migration. The results of this action will be monitored and communicated with USFWS and NMFS. During the operation, safety-related restrictions will continue, including but not limited to maintaining ramp rates for minimizing project erosion and maintaining power grid reliability. Following this operation, the John Day reservoir elevation will return to MIP through August 31.
- c) Impacts to FPP Criteria: None planned.

### 4.2. JDA Studies

There are no studies planned at John Day Dam in 2023.

## 5. McNARY DAM

### 5.1. MCN Special Operations

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage and navigation lock maintenance.

#### 5.1.1. Fish Ladder Exit, Entrance, Regulating/Tilting Weir Maintenance

- a) Dates: Monthly (Long-Term).
- b) Description: The *Oil Accountability Program* PMs maintenance efforts require the project to operate all equipment monthly and semi-annually to assess oil/grease requirements and to ensure seals do not dry out or stick to shafts. The motors for each weir can be operated during the winter outage to exercise seals.
- c) Impacts to FPP Criteria: None planned. Minimal impact due to coordination of outages and use of non-peak adult fish passage times. Any modification or deviation from FPP criteria will be coordinated with FPOM.

#### 5.1.2. Spillway Safety Restrictions

- a) Dates: Long Term (year-round).
- b) Description: Spillway Hoist and Spillway Crane maintenance requires HECP safety boundaries to include the hoist being worked upon and the adjacent hoists on both sides of the affected hoist and the Spillway Cranes are both being set to step 4 and dogged in position to limit excessive actuation of the crane's electrical equipment. Also, due to the overloaded condition of the spillway hoists, it has been determined that any preventative or corrective maintenance will require spillway hoists to be lowered on seal and tagged out prior to any access onto hoists or gates. This ensures the safety of personnel and equipment.
- c) Impacts to FPP Criteria: None planned. Minimal impact due to spill pattern changes to support spillway cranes and potential intermittent spill pattern changes due to unforeseen hoist maintenance. Any modification or deviation from FPP criteria will be coordinated with FPOM.

#### 5.1.3. Outages for Digital Excitation/Governor Upgrades.

- a) Dates: FY22 – FY26
- b) Description: Replacing Exciters and Governors with digital systems to upgrade generators to current electrical standards, Mechanical Governor Upgrades, Power House Control Systems Upgrades, Isophase, HV Bus and XJ Switch upgrades.
- c) Impacts to FPP Criteria: Unit priority will be affected and commissioning requirements will require exceeding 1% generation during testing of Over Speed Protection, Upper and Lower Excitation Limits, Mechanical Governor Response Times, and other reliability tests necessary. Some specific testing will require raising ESBSs during testing periods,

especially when determining new Generator Capability Curve data. Due to the extended period of these contracts, raising ESBSs and exceeding 1% may occur at any unknown time of the year.

#### **5.1.4. Waterfowl Nesting**

- a) Dates: April through July (annually).
- b) Description: Since 1982, McNary pool is operated for waterfowl nesting on Lake Wallula annually from late April through early July. During this operation, the McNary pool may be restricted to an operating range of 337'–340' elevation. Pool elevations are also operated in the range of 338.5'–339.5' for 4-6 hours during daylight hours at least once every 4 days.
- c) Impacts to FPP Criteria: None. Provided for informational purposes only.

#### **5.1.5. Transformer Gasket Replacement, Capitol Project.**

- a) Dates: April to October.
- b) Description: Transformer gasket replacement will occur with associated unit outages.
- c) Impacts to FPP Criteria: When a unit is out of service for transformer gasket replacement, the next available unit in the priority order will be operated.

## **5.2. MCN Studies**

There are no studies planned at McNary Dam in 2023.

## **6. ICE HARBOR DAM**

### **6.1. IHR Special Operations**

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage, navigation lock maintenance, and Doble testing.

#### **6.1.1. Unit 1 Turbine Runner Replacement**

- a) Dates: 2023 through 2025.
- b) Description: Unit 1 will be out of service through 2025 to replace the runner. After the unit is returned to service, commissioning will require full load rejection testing (10 days), which needs to be completed with no submerged traveling screens (STS) installed.
- c) Impacts to FPP Criteria: While Unit 1 is out of service and unavailable for operation, the project will operate the next available unit in the FPP priority order. Full load rejection testing will be coordinated with FPOM via a separate MOC.

#### **6.1.2. LSP-1 Switchgear Testing**

- a) Dates: March 17 and 18, 2023
- b) Description: LSP-1 switchgear will be out of service each workday for electrical testing. There will be no power to the entire north shore of the dam, including the north fish ladder entrance weir gates, the north fish count station, upper diffuser valve, and AWS pumps, and spill gates. Spill gate 2 will be powered by the emergency diesel generator to open and close the RSW. A portable generator will power the video camera system and lights at the fish count station. The upper diffuser valve will be set at the percent open that should provide the proper amount of water. The north shore entrance weir will be set at a level that should provide the proper entrance weir depth.
- c) Impacts to FPP Criteria: With the AWS pumps out of service, the channel/tailwater head will be well under criteria. This will be coordinated via a separate MOC.

#### **6.1.3. Lines 1 and 2 Maintenance**

- a) Dates: April 14, 2023
- b) Description: BPA will be conducting maintenance on 115 kv lines 1 and 2. Units 1, 2, 3, and 4 will be out of service as a result of the line outage. Unit 2 will be run at speed-no-load to provide station service to power the plant.
- c) Impacts to FPP Criteria: Units 6 will be first in unit operating priority, followed by unit 5. This will be coordinated with FPOM via a separate MOC.

#### **6.1.4. Doble Testing (see section 1.5 above for more information)**

- a) Dates: Summer (annually). In 2023, the outage is scheduled for July 17-21.
- b) Description: The outage in 2023 is required to perform Doble testing of TW3 and TW4, which will take Units 3 and 4 out of service continuously during testing. Doble testing



conducted in conjunction with the scheduled 6-year overhaul on Unit 4. Remaining available units (2, 5, 6) will be operated per FPP priority order.

- c) Impacts to FPP Criteria: None. Since Ice Harbor has multiple transformer banks and transmission lines and redundant switching capability, remaining available units will be available and operated pursuant to FPP priority order.

## 6.2. IHR Studies

### 6.2.1. IHR Unit 3 Direct Injury and Sensor Fish Characterization.

- a) Dates: September–October 2023
- b) Description: Juvenile spring Chinook and Sensor Fish will be directly released into unit 3 to evaluate the new Kaplan runner. The study is expected to require approximately four weeks of total study time. Direct release pipes will be installed in all three intakes of Unit 3 for direct fish and Sensor Fish releases. Release pipes will be installed on the STS frames. Three specific turbine operations will be tested. Project support will be provided for equipment install, removal, and turbine operations. A one-day Unit 3 outage is expected for release pipe install and removal. Another consideration will be river flow and unit priority during the study period. Specific dates for Project support, outages, and operations will be scheduled appropriately with the Project and through FPOM closer to study implementation.
- c) Impacts to FPP Criteria: Any modification to unit priority order or other FPP criteria will be coordinated through FPOM.

## 7. LOWER MONUMENTAL DAM

### 7.1. LMN Special Operations

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage, navigation lock maintenance, and Doble testing.

#### 7.1.1. Lower Monumental Head Gate Rehab

- a) Dates: Ongoing through 2029.
- b) Description: Under the BPA Large Cap Program, parts and materials have been acquired to rehabilitate the Lower Monumental head gates. The work started in December 2012. To facilitate the process, units will be scheduled out of service to remove or replace head gates. The head gates will be serviced in the repair pit and then placed back into service.
- c) Impacts to FPP Criteria: Deviation from unit priority will be necessary to swap head gates from the unit to the pit. The duration of the outage is expected to be one day.

#### 7.1.2. Model Validation Testing

- a) Dates: September through March (annually).
- b) Description: Western Electricity Coordinating Council (WECC) requires steady state model validation testing periodically to ensure generating equipment will meet real and reactive power ratings. All units are tested on a one to two-year cycle. Tests are also required when equipment is replaced or upgraded. Tests will require running the unit out of FPP priority and outside the 1% range. Testing can occur any time from September 1–March 31 and will not occur during peak juvenile fish passage (April 1–August 31). Tests will preferably be conducted just after annual maintenance but may happen at other times. Test durations will be minimized to the extent possible and will only be run for the purpose of completing required model validation testing.
- c) Impacts to FPP Criteria: May require running a unit out of FPP priority and outside 1%.

#### 7.1.3. Doble Testing (see section 1.5 above for more information)

- a) Dates: Summer (annually). In 2023, the outage is scheduled for July 24–August 3.
- b) Description: During the 2023 outage, the project will upgrade the T1 iso-phase bus, which will consist of replacing the doghouse covers, replacing gaskets with upgraded materials, cleaning, and inspections. The outage will require T1 and T2 (all units) out of service for up to 11.5 hours (0530-1800) on the first and last day of the outage to hang clearances. During these hours, all project outflow will be spilled except 8 kcfs through Unit 5 for station service power. During all other hours, T2 (Units 5 and 6) will be available and operated per FPP priority order.
- c) Impacts to FPP Criteria: All units will be out of service for up to 11.5 hours (0530-1800) and all project outflow will be spilled except approximately 8 kcfs through Unit 5 for station service.

#### 7.1.4. **T-2 Rehabilitation**

- d) Dates: August 3 - October 5, 2023
- e) Description: Units 1-4 will be out of service from 0700-1700 on August 3 and from 0700-1700 on September 28 to support opening of T-2 modification. Units 5-6 will be out of service during the duration of the outage for refurbishment, Doble testing, XJ5 breaker annual for Unit 5 and the Unit 6 annual.
- f) Impacts to FPP Criteria: Units 1-4 will be out of service for up to ten hours on August 3 and October 5. Units 5-6 will be out of service during the length of the outage.

#### 7.1.5. **MU1 Maintenance**

- g) Dates: November 27 - December 14, 2023.
- h) Description: Unit 1 will be out of service from November 27 to December 14, 2023, to complete unit annual maintenance.
- i) Impacts to FPP Criteria: From November 27-30, deviation from FPP unit priority order will be necessary in order to complete the maintenance. The priority order for fish passage starts with Unit 1, then proceeds in order from north to south. Removing unit 1 from service will change the attraction flow to the north adult fish ladder. Starting December 1, there is no FPP priority order (units may be operated in any order).

### 7.2. **LMN Studies**

#### 7.2.1. **Lower Monumental Dam Juvenile Lamprey Survival**

- a) Dates: March through Sept 2023
- b) Description: From March through September 2023, juvenile lamprey will be tagged and released upstream of the Lower Monumental Dam. The removable spillway weir (RSW) may need to be taken out of service for a few hours for one day in March or April to test the acoustic arrays in the forebay with a remote operated boat. This study will help inform juvenile Pacific Lamprey passage conditions, migration behavior, and fate. The objectives of this are to:
  - Determine distribution and approach routes (including vertical, horizontal, and temporal) of juvenile lamprey in the forebay of Lower Monumental Dam.
  - Determine passage and proportions through all fish passage routes to include the RSW, conventional spill bays, juvenile bypass systems (JBS), and turbines by juvenile lamprey throughout fish passage season.
  - Calculate whole project survival of juvenile lamprey (from forebay to tailrace)
  - Relate project operations (including hydrograph) to passage and route selection
  - Determine reach survival of juvenile lamprey and reservoir residence time through the lower Snake River.
- c) Impacts to FPP Criteria: To be determined. Any modification to or deviation from FPP criteria will be coordinated with FPOM.

## 8. LITTLE GOOSE DAM

### 8.1. LGS Special Operations

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage, navigation lock maintenance, and Doble testing.

#### 8.1.1. Doble Testing & T1 Isophase Bus Upgrades (see section 1.5 above for more information)

- a) Dates: Summer (annually). In 2023, the outage is scheduled for July 31–August 12.
- b) Description: During the 2023 outage, the project will upgrade T1 iso-phase bus, which will consist of replacing doghouse covers and replace thru-bushing bus ducting. The upgrades will reduce risk of water intrusion and increase efficiency in future outages. While some of the Doble and maintenance are conducted concurrently, portions of both will need to be conducted at the beginning and end of the required outage. Access to these areas requires significant transformer outages, thus combining maintenance and Doble efforts reduces future impacts. T1 will be Doble tested and Units 1-4 will be out of service continuously from July 31 through August 12. T2 (Units 5, 6) will also be out of service daily from 0500-1700, with Unit 5 (or Unit 6 if Unit 5 is unavailable) at 8 kcfs for station service power. T2 will return to service nightly from 1700-0500 and Units 5, 6 operated as available per FPP priority order.
- c) Impacts to FPP Criteria: Daily from 0500-1700, all units will be out of service and all project outflow spilled except 8 kcfs for station service through Unit 5 (or Unit 6 if Unit 5 is unavailable).

### 8.2. LGS Studies

#### 8.2.1. Kelt Collection & Reconditioning

- a) Dates: April to July
- b) Description: The Nez Perce Tribe (NPT) Department of Fisheries Resources Management will collect wild/natural post-spawned, emigrating steelhead from the separator at Little Goose Juvenile Fish Facility. These fish will be transported to the Nez Perce Tribal Hatchery (NPTH) or Dworshak National Fish Hatchery (DNFH) to be utilized in the kelt reconditioning program.
- c) Impacts to FPP Criteria: None.

## 9. LOWER GRANITE DAM

### 9.1. LWG Special Operations

Special project operations that may require deviations from FPP criteria will be coordinated with FPOM either by inclusion in this Appendix or in-season via a Memo of Coordination (MOC), pursuant to **FPP Chapter 1 (Overview)**. See **section 1** above for special operations related to spill for juvenile fish passage, navigation lock maintenance, and Doble testing.

#### 9.1.1. Head Gate Repair

- a) Dates: Bi-Monthly (long-term).
- b) Description: This is a long-term program to return head gates to a safe operating condition by adding new roller chain, seals, anodes, and other miscellaneous components. The plan will require brief unit outages throughout the year while transporting rebuilt gates from the turbine units to the repair pit and back. Each swap will take 4–6 hours to complete and occur approximately every 2 months.
- c) Impacts to FPP Criteria: None anticipated. Head gate movements are expected to take place concurrently with other outages. As the program progresses and fewer head gates need repair, it may require an occasional outage on a priority unit. Available units will be operated pursuant to FPP priority order within  $\pm 1\%$  of peak turbine efficiency.

#### 9.1.2. ESBS Repair

- a) Dates: Bi-Monthly (long-term).
- b) Description: This is a long-term program to return ESBSs to a safe operating condition by tearing down, repainting, and rebuilding the screens. The plan will require brief unit outages throughout the year while transporting rebuilt ESBSs from the turbine units to the repair pit and back. Each swap will take 4–6 hours to complete and occur approximately every 2 months.
- c) Impacts to FPP Criteria: None anticipated. ESBS movements are expected to take place concurrently with other outages. As the program progresses and fewer screens need repair, it may require an occasional outage on a priority unit. Available units will be operated pursuant to FPP priority order within  $\pm 1\%$  of peak turbine efficiency.

#### 9.1.3. Replace Powerhouse 480 Volt and 125 Volt DC Control Voltage Switchgear

- a) Dates: 2020–2023 (dates to be determined).
- b) Description: Replace all PH 480 Volt and 125 Volt DC control voltage switchgear. This work will involve multiple outages on various units and systems over the next 3 years. Outage times and dates have not been determined and will be dependent on the contractor's schedule. Available units will be operated in FPP unit priority order during outages.
- c) Impacts to FPP Criteria: None. When a unit is out of service, the next unit in the FPP priority order will be operated.

**9.1.4. Doble Testing (see section 1.5 above for more information)**

- a) Dates: N/A (no Doble testing scheduled in 2023).
- b) Description: N/A
- c) Impacts to FPP Criteria: N/A

**9.2. LWG Studies****9.2.1. Genetic Stock Identification (Idaho Department of Fish & Game)**

- a) Dates: March 1 – June 28
- b) Description: 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.
- c) Impacts to FPP Criteria: None.

**9.2.2. Kelt Study (Nez Perce Tribe, University of of Idaho, CRITFC)**

- a) Dates: March 1 – June 29
- b) Description: This research investigates steelhead kelt physiology and endocrinology to evaluate the feasibility and success of rehabilitating strategies. Selected kelts collected at Lower Granite are transported by NPT to Dworshak National Fish Hatchery for reconditioning and later release as part of this study.
- c) Impacts to FPP Criteria: None.

**9.2.3. PIT-Tag Adult Wild Chinook and Adult Steelhead for ISEMP-Related Dispersal Monitoring (NOAA Fisheries)**

- a) Dates: TBD
- b) Description: The goal of this project is to PIT-tag up to 4,000 unclipped adult Chinook and 4,000 unclipped adult steelhead collected in the adult trap daily sample for dispersal monitoring.
- c) Impacts to FPP Criteria: None.

**9.2.4. Lower Granite Dam Juvenile Lamprey Survival**

- a) Dates: March through Sept 2023
- b) Description: From March through September of 2023, juvenile lamprey will be tagged and released upstream of the Lower Granite Dam. The removable spillway weir (RSW) may need be taken out of service for a few hours for one day in March or April to test the acoustic arrays in the forebay, with a remote operated boat. This study will help inform juvenile Pacific Lamprey passage conditions, migration behavior, and fate. The objectives of this Juvenile Lamprey passage and survival study at Lower Granite are to:

- Determine distribution and approach routes (including vertical, horizontal, and temporal) of juvenile lamprey in the forebay of Lower Granite Dam.
  - Determine passage and proportions through all fish passage routes to include the RSW, conventional spill bays, juvenile bypass systems (JBS), and turbines by juvenile lamprey throughout fish passage season.
  - Calculate whole project survival of juvenile lamprey (from forebay to tailrace)
  - Relate project operations (including hydrograph) to passage and route selection
  - Determine reach survival of juvenile lamprey and reservoir residence time through the lower Snake River.
- c) Impacts to FPP Criteria: To be determined. Any modification to or deviation from FPP criteria will be coordinated with FPOM.

#### **9.2.5. Sampling of Adult Steelhead, Chinook, and Sockeye for Biological Data Collection (IDFG and NOAA Fisheries)**

- a) Dates: April 4 – December 15
- b) Description: Upriver migrating adult steelhead, spring/summer Chinook salmon, and sockeye salmon are collected from the adult trap from 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.
- c) Impacts to FPP Criteria: None.

#### **9.2.6. Bull Trout PIT-Tagging and Genetic Sample Collection for USFWS**

- a) Dates: April 4 – December 15
- b) Description: Bull trout will be collected as part of the normal adult trap daily sample and using the adult sort-by-code (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.
- c) Impacts to FPP Criteria: None.

#### **9.2.7. Subyearling Chinook Parentage-Based Tagging (USGS)**

- a) Dates: June 1–15 and July 1–15
- b) Description: The goal of this project is to determine the abundance of unmarked, untagged, natural- and hatchery-origin subyearling Chinook salmon in Lower Granite

sample collection. Fin clips will be taken from 30 unclipped, untagged subyearling Chinook each day from June 1-15 and for another two weeks in July depending in fish passage numbers.

- c) Impacts to FPP Criteria: None.

**9.2.8. Collection of Adult Fall Chinook and Coho for Hatchery Broodstock – (WDFW and Nez Perce Tribe)**

- a) Dates: August 18 until broodstock requirements are met
- b) Description: Adult fish are collected in the adult trap. Fall Chinook are transported by WDFW employees to Lyons Ferry hatchery and by NPT employees to Dworshak hatchery. Coho are transported by NPT and transported to Dworshak hatchery.
- c) Impacts to FPP Criteria: None.