

**2024 Fish Passage Plan  
Appendix A  
Special Project Operations & Studies**

**Table of Contents**

**1. INTRODUCTION ..... 1**

    1.1. Purpose ..... 1

    1.2. Schedule ..... 1

    1.3. Spill for Juvenile Fish Passage ..... 1

    1.4. Navigation Lock Maintenance ..... 1

    1.5. Doble Testing ..... 2

**2. BONNEVILLE DAM ..... 3**

    2.1. BON Special Operations ..... 3

    2.2. BON Studies ..... 3

**3. THE DALLES DAM ..... 4**

    3.1. TDA Special Operations ..... 4

    3.2. TDA Studies ..... 4

**4. JOHN DAY DAM ..... 5**

    4.1. JDA Special Operations ..... 5

    4.2. JDA Studies ..... 5

**5. McNARY DAM ..... 7**

    5.1. MCN Special Operations ..... 7

    5.2. MCN Studies ..... 8

**6. ICE HARBOR DAM ..... 10**

    6.1. IHR Special Operations ..... 10

    6.2. IHR Studies ..... 10

**7. LOWER MONUMENTAL DAM ..... 11**

    7.1. LMN Special Operations ..... 11

    7.2. LMN Studies ..... 11

**8. LITTLE GOOSE DAM ..... 12**

    8.1. LGS Special Operations ..... 12

    8.2. LGS Studies ..... 12

**9. LOWER GRANITE DAM ..... 13**

    9.1. LWG Special Operations ..... 13

    9.2. LWG Studies ..... 14

## 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, equipment/machinery repair and replacement). In 2024, the outage at NWW projects is scheduled for an extended period to allow completion of multiple projects, including electrical upgrades, structural improvements, repair of damaged concrete, and replacement of timber wall armor with more fish-friendly materials. The 2024 schedule is as follows:

Project	Lock Outage
BON	March 3 - 16
TDA	March 3 - 16
JDA	March 3 - 16
MCN	January 14 – March 29

Project	Lock Outage
IHR	February 26 – March 22
LMN	January 14 – March 29
LGS	January 14 – March 29
LWG	January 14 – March 29

## 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 2024.<sup>a</sup>**

Project	Dates	Outage (Transformer & Units)	Notes <sup>b</sup>
IHR	July 15-19	TW5 & TW6 (Units 5, 6) all hours	Remaining available units (2, 3, 4) operated per FPP priority order.
LMN	N/A		No Doble Testing in 2024.
LGS	July 15 – August 11	T1 (Units 1–4) first / last day T2 (Units 5, 6) continuous	All units OOS 0500-1700 first and last day. Units 5 & 6 will remain OOS during the continuous T2 outage with Units 1 – 4 operating per FPP priority order.
LWG	12-16 August	T1 (Units 1-4) All hours T2 (Units 5, 6) OOS daytime, RTS nightly	All units OOS 0600-1800. Unit 5 @ ~8 kcfs for station service. Units 5 & 6 will RTS nightly.
DWR	N/A		No Doble testing in 2024

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.

### 2.2. BON Studies

#### 2.2.1. Powerhouse 2 Fish Guidance Efficiency (FGE) Gatewell Improvement Post-Construction Evaluation (AFEP Study Code: SPE-P-24-1).

a) Dates:

Spring/Summer 2024 (final dates pending coordination and finalization of study design).

b) Description:

*The description below is current as of February 6, 2024. Study details are still being refined and subject to change.*

The concrete gatewell modifications to the A & B slots of Main Units 11-18 at Bonneville Dam Powerhouse 2 were completed in November 2023. The goal of this study is to evaluate whether these structural modifications have resulted in acceptable fish passage conditions during turbine unit operation throughout the middle and upper 1% peak efficiency range. This study will use biological fish condition monitoring at the Juvenile Monitoring Facility (JMF) to compare the distributions of descaling and mortality of JMF samples at the middle and upper 1% peak efficiency range for spring and summer in 2024.

The study consists of a randomized block-treatment study design for 2024 spring and summer. The spring study period will have eight treatment blocks between April and May. The summer period will have eight treatment blocks that are between June and July. The block-treatment study design will result in eight, 24-hour JMF samples during mid 1% peak efficiency range operations and eight, 24-hour JMF samples during upper 1% peak efficiency range operations which will be used to test for differences in descaling and mortality rates between operations. Each block will be less than a week in duration, covering two operational treatments (mid 1% peak efficiency range and upper 1%) that are randomized within the block timeframe. Note that there is additional operation time surrounding test treatments within each block expanding beyond the 24-hour JMF sample period in which the turbines will be operating at the specified 1% test treatment range to ensure ample time between each flow treatment condition for fish to exit the gatewells.

Additionally, a separate study (*still under development and subject to change*) to evaluate potential fish impingement on the Vertical Barrier Screens (VBSs) of a single unit will occur on selected dates throughout the spring and summer test periods. This study involves deployment of underwater monitoring equipment in gatewells 15A (modified) and 15C (unmodified) during specified operations in the mid and upper 1% of the peak efficiency range. The impingement will be evaluated by estimating VBS contact rates

during five 24-hour periods of each of the spring and summer juvenile migration periods. If U15 is OOS during an impingement test day, the adjacent main unit gatewells A&C will be used in its place following the revised testing unit priority.

**Test objectives include:**

1. Run as many PH 2 units as feasible to correspond to test treatment band within the specified 1% peak efficiency range. The general treatment bands include:
  - a. FPP middle 1% peak efficiency
  - b. Upper 1%\* peak efficiency

\*A detailed operation schedule with upper 1% flow ranges defined will be provided to Bonneville Dam Operations and a teletype will be issued\*

**\*\*Do not operate above the 1% upper limit during testing \*\***

2. Conduct a VBS impingement study. For up to 10 impingement test days between April and July, monitoring equipment will be deployed in gatewells 15A & 15C for a 24-hour period per impingement test day. This study will require operating Unit 15 in the upper 1% peak efficiency range for up to 6 out of 10 impingement test days between April and July.
- c) Impact to FPP Criteria:

Unit outages and test operations may result in PH2 units being operated out of unit priority order defined in FPP Table BON-13 to move Units 15, 16, and 14 higher in the order:

FPP Table BON-13 Priority Order: 11, 18, 12, 17, 13, 14, 15, 16

Testing Priority Order: 11, 18, **15, 16, 14**, 12, 17, 13

PH2 Units under test operations during the upper 1% peak efficiency treatment may be out of criteria defined in FPP BON 4.2.1.2.b. The test schedule may be priority over FPP Section 4.2.1.2.b.ii.3-4.

To allow PH2 units to operate within the upper 1% test flow range during periods of higher operational head, the forebay may be restricted to the lower end of the normal operating range.

### 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 2024.

## 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. Any modification to FPP criteria will be coordinated through FPOM.

### 4.2. JDA Studies

#### 4.2.1. Juvenile lamprey telemetry passage studies.

- a) Dates: March – June 2024
- b) Description: A combination of JSATS cabled dam-face arrays (fixed locations on the upstream side of the dam) and autonomous receiver arrays will be utilized in this study for estimating overall MCN and JDA passage survival and MCN-to-JDA reach survival. Juvenile (and larval) lamprey collected from JDA, MCN, and LMN will be tagged and released at locations 30km upstream of McNary Dam and 40km upstream of John Day Dam. Collection of juvenile Pacific lamprey at dams on the Columbia and Snake rivers is dependent on the operation of the JBS at these facilities. If an adequate number of lamprey are not available from the daily sample collection at the JFFs, lamprey may be collected from alternative sources including the Yakama Nation (e.g., Satus Creek, Toppenish Creek [upper and lower traps], Ahtanum Creek, Chandler Dam), Confederated Tribes of the Umatilla Indian Reservation (CTUIR) (e.g., 3-Mile Dam smolt trap, Upper Umatilla River trap), Oregon Department of Fish and Wildlife (ODFW) screw traps (Birch Creek and Fifteenmile Creek), and artificially propagated

lamprey (from Yakama Nation, CTUIR, and/or Abernathy Fish Technology Center). In addition, alternative methods of collection may be used to trap lamprey from locations within the raceways (e.g., tailscreens, headboxes) and within the sample holding tanks at MCN, JDA, and/or LMN.

- c) Impacts to FPP Criteria: None anticipated. Any modification to unit priority order, JFF operation, or other FPP criteria will be coordinated through FPOM.

## 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: Due to the overloaded condition of the spillway hoists and cranes, most gates will be operated in a split leaf configuration, which splits the upper gate section from the lower gate section. If a gate is operating in the full gate configuration, where the upper gate section is pinned to the lower gate section, the gate must be set down on seal and tagged out before being approached by personal for work. If hoists adjacent to the hoist being worked on are also operating in a full gate configuration, those gates must also be set down on seal and tagged out. This ensures the safety of personnel and equipment.
- c) Impacts to FPP Criteria: 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% 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, 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 time of 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**

#### **5.2.1. Juvenile lamprey telemetry passage studies.**

- a) Dates: March – June 2024
- b) Description: A combination of JSATS cabled dam-face arrays (fixed locations on the upstream side of the dam) and autonomous receiver arrays will be utilized in this study for estimating overall MCN and JDA passage survival and MCN-to-JDA reach survival. Juvenile (and larval) lamprey collected from JDA, MCN, and LMN will be tagged and released at locations 30km upstream of McNary Dam and 40km upstream of John Day Dam. Collection of juvenile Pacific lamprey at dams on the Columbia and Snake rivers is dependent on the operation of the JBS at these facilities. If an adequate number of lamprey are not available from the daily sample collection at the JFFs, lamprey may be collected from alternative sources including the Yakama Nation (e.g., Satus Creek, Toppenish Creek [upper and lower traps], Ahtanum Creek, Chandler Dam), Confederated Tribes of the Umatilla Indian Reservation (CTUIR) (e.g., 3-Mile Dam smolt trap, Upper Umatilla River trap), Oregon Department of Fish and Wildlife (ODFW) screw traps (Birch Creek and Fifteenmile Creek), and artificially propagated lamprey (from Yakama Nation, CTUIR, and/or Abernathy Fish Technology Center). In addition, alternative methods of collection may be used to trap lamprey from locations within the raceways (e.g., tailscreens, headboxes) and within the sample holding tanks at MCN, JDA, and/or LMN.
- c) Impacts to FPP Criteria: None anticipated. Any modification to unit priority order, JFF operation, or other FPP criteria will be coordinated through FPOM.

**5.2.2. MCN Spillway Direct Injury Evaluation.**

- a) Dates: March 1-31, 2024.
- b) Description: Juvenile spring Chinook will be directly released into a spillbay in the split-leaf orientation and the TSW. The study is expected to require approximately four weeks of total study time. Direct release pipes will be installed in spillbay and TSW for direct fish releases. Split-leaf spill operation will be compared to the TSW for direct fish injuries. Project support will be provided for equipment install and removal. 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.

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

- a) Dates: July 15-19.
- b) Description: The outage in 2024 is required to perform Doble testing of TW5 and TW6, which will take Units 5 and 6 out of service continuously during testing. Remaining available units (2, 3, 4) 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

There are no studies planned at Ice Harbor Dam in 2024.

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

- a) Dates: N/A (no outage in 2024)
- b) Description: N/A
- c) Impacts to FPP Criteria: N/A

### 7.2. LMN Studies

There are no studies planned at Lower Monumental Dam in 2024.

## 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 & T2 Transformer Monitoring Equipment Upgrades** (see section 1.5 above for more information)

- a) Dates: Summer (annually). In 2024, the outage is scheduled for July 15–August 11.
- b) Description: The 2024 outage is required to perform doble testing and T2 monitor equipment installation. T1 will be Doble tested and Units 1-4 will be out of service July 15 (first day) and August 11 (last day) from 0500 - 1700. During all other hours, Units 1–4 will be operated per FPP priority order T2 (Units 5, 6) will be Doble tested and out of service continuously for transformer monitoring equipment installation due to elevated maintenance needs of aging equipment. More monitoring is required to avoid catastrophic failures to avoid excessive loss of life and equipment. Installation of a total transformer monitoring system will include new sensors for winding and oil temperatures, high-capacity pressure relief devices, LTC monitoring, and real-time busing monitoring.
- c) Impacts to FPP Criteria: Daily from 0500-1700 on July 15 and August 11, all units will be out of service and all project outflow spilled.

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

- a) Dates: August 12-16
- b) Description: The outage in 2024 is required to perform Doble testing and routine maintenance on T1. Some of the work needs to be done from the top of the transformer on T1, which will require the powerhouse line (all units) to be out of service daily from August 12 at 0600 through August 16 at 1800. T1 (Units 1-4) will remain OOS continuously through the entire outage period, however T2 (Units 5 and 6) will RTS nightly, Unit 5 will be operated for station service power (approximately 8 kcf) while the PH line is OOS (daily, Aug 12-16).

- c) Impacts to FPP Criteria: All units will be out of service for up to 12 hours/day (0600-1800) daily from August 12 through August 16. During these hours, all project outflow will be spilled except approximately 8 kcfs through Unit 5 for station service power.

## 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 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. **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.

**9.2.5. 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.

**9.2.6. 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.

**9.2.7. 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.