2014 Fish Passage Plan

Section 1 – Overview

Table of Contents

1. FISH PASSAGE PLAN (FPP) OVERVIEW

1.1. Background

The Fish Passage Plan (FPP) is developed annually by the U.S. Army Corps of Engineers (Corps) in coordination with the region's Federal, State and Tribal fish agencies, the Bonneville Power Administration (BPA), and other regional partners through the Corps' Fish Passage Operations & Maintenance (FPOM) coordination team. The FPP describes year-round operations and maintenance (O&M) activities at Corps mainstem hydroelectric projects in the Federal Columbia River Power System (FCRPS; **Figure OVE-1**) that are coordinated through FPOM to protect and enhance anadromous and resident fish species listed as endangered or threatened under the Endangered Species Act (ESA), as well as non-listed species of concern (e.g., lamprey, sturgeon). The FPP guides Corps actions to provide fish protection and passage at eight Corps projects on the mainstem lower Columbia and lower Snake rivers, at Chief Joseph Dam on the upper Columbia River and at Dworshak Dam on the North Fork Clearwater River. Other Corps documents and agreements related to fish passage at these projects are consistent with the FPP.

Pursuant to the ESA Section 7, NOAA Fisheries issued a Biological Opinion (BiOp) on May 5, 2008, on the effects of FCRPS operations on ESA-listed anadromous fish species that included a Reasonable and Prudent Alternative (RPA) suite of recommended actions and strategies. The 2008 FCRPS BiOp was supplemented on May 20, 2010, with new information and an Adaptive Management Integration Plan (AMIP), and again on January 17, 2014, with review of new and updated scientific reports and data, additional project definitions, analyses and amended RPA actions. The U.S. Fish & Wildlife Service (USFWS) issued a BiOp on effects of the FCRPS on ESA-listed resident fish species (e.g., bull trout, white sturgeon) in 2000 and supplemented in 2006. In response to the FCRPS BiOps, the Corps prepared Records of Consultation and Statement of Decision (ROCASOD) to document Corps decisions to implement the actions and operate the FCRPS in a manner that enhances survival and recovery of ESA-listed fish species as well as other regionally important fish species. The BiOps, decision documents and other related information are available online at: http://www.salmonrecovery.gov.

The FPP is developed in accordance with the NOAA FCRPS BiOp RPA Action 32 as part of the hydropower strategy of operating and maintaining fish passage facilities to maintain biological performance. Key elements of the FPP include:

- **i.** Operate according to project-specific criteria and dates to operate and maintain fish facilities, turbine operating priorities, and spill patterns;
- **ii.** Operate according to fish transportation criteria;
- **iii.** Maintain turbine operations within ±1% of peak turbine efficiency (1% range);
- **iv.** Maintain spill rates and dates for fish passage;
- **v.** Implement TDG monitoring plans;
- **vi.** Operate according to protocols for fish trapping and handling;

vii. Take advantage of low river conditions, low reservoir elevations or periods outside juvenile migration season for repairs, maintenance, or inspections so there is minimal or no effect on juvenile fish;

viii. Coordinate routine and non-routine maintenance that affects fish operations or structures to eliminate and/or minimize fish operation impacts;

ix. Schedule routine maintenance during non-fish passage periods;

x. Conduct non-routine maintenance activities as needed; and

xi. Coordinate criteria changes and emergency operations with FPOM.

The FPP is revised as necessary to incorporate changes to project O&M as a result of new facilities or changes in operational procedures. Revisions will incorporate changes adopted through coordination with NOAA Fisheries and USFWS as part of the ESA Section 7 consultation, Recovery Plan, or Section 10 permit processes, and through consideration of other regional input and plans. When revising the FPP, the Corps also considers the amended Northwest Power and Conservation Council's Columbia River Basin Fish and Wildlife Program to the fullest extent practicable. If any revisions to the FPP are necessary, they will be made in accordance with the coordination process for revisions (**Section 3** below).

Comments on the FPP are welcome and may be sent to FPOM and/or the Corps' Northwestern Division, Reservoir Control Center (RCC) Fisheries Section in Portland, Oregon. Draft and final FPPs from 2000 through present, including all Change Forms, are available online at the *Fish Passage Plan Website*: http://www.nwd-wc.usace.army.mil/tmt/documents/fpp/

1.2. Emergency Deviations from Fish Passage Plan Criteria

River operations emergencies may occur that require projects to deviate temporarily from the FPP. To the extent practicable, these operations will be coordinated with fish agencies and tribes and conducted in a manner to avoid or minimize fish impacts. Normally, coordination occurs prior to an action; however, if an emergency situation requires immediate attention, coordination will be completed as soon as practicable afterwards (see **Section 3** below).

The phrase "when practicable" appears in the FPP to describe project actions for fish that may vary on a case-by-case basis and thus require the exercise of professional judgment by project staff. These situations may be due to factors such as real-time biological or other environmental conditions, project staffing or mechanical equipment availability, and fish facility or dam structural integrity. In these cases, the project biologist and other project personnel will consider all relevant factors and determine the best way to proceed and implement appropriate action. These actions will be coordinated with fish agencies and tribes when they deviate from the FPP.

1.3. Technical Management Team (TMT)

In-season decisions on river operations to achieve BiOp biological performance standards for spring and summer outmigrants will be made in coordination with the regional forum Technical Management Team (TMT). Special operations identified in the FPP will be coordinated through

TMT and identified in the annual *Water Management Plan*. These may include maintenance or research activities requiring unit outages that affect other river operations, operation of turbines outside of the ±1% of peak efficiency range, zero nighttime generation, and implementation of the *Juvenile Fish Transportation Plan* (JFTP; see **Appendix B**).

1.4. Spill for Juvenile Fish Passage

Planned yearly spring and summer spill operations for juvenile fish passage at the eight lower Snake and lower Columbia River projects are defined in the *Fish Operations Plan* (FOP), included in the FPP as **Appendix E**. Spill operations to improve juvenile fish passage are defined in the 2014 Supplemental FCRPS BiOp RPA Action 29 and Table 2.

1.5. Total Dissolved Gas (TDG) Monitoring

The Federal Clean Water Act establishes the total dissolved gas (TDG) aquatic life criteria of 110% that has been adopted by the states of Washington, Oregon, Idaho and Montana. During spill operations for fish passage, Oregon and Washington have authorized exceptions (waiver and rule adjustment, respectively) of 120% in the project tailwater. The Oregon waiver applies to spill for fish passage April 1–August 31. The Washington rule adjustment applies to spill for fish passage year-round and includes a standard of 115% in the next downstream forebay. As such, the Corps monitors TDG levels in the forebay and tailrace of each project to ensure that spill for fish passage is in accordance with State standards.

The annual *TDG Management Plan* (included in the *Water Management Plan* as Appendix 4) provides the most current information regarding State water quality standards and includes detailed explanations of types of spill (e.g., fish passage, lack of turbine, etc.), the process for coordinating and implementing a spill priority list to manage system-wide TDG, the process for setting spill caps, and TDG management policies and monitoring programs. The Corps will coordinate with TMT to develop the spill priority list and to provide ongoing TDG information and reports as necessary.

1.6. System Load Shaping

BPA coordinated development of *System Load Shaping Guidelines Regarding Turbine Operation & Peak Efficiency* (**Appendix C**) to avoid or minimize impacts of hydropower operations on fish. The guidelines define how BPA requests load April 1–October 31 so that the Corps can operate turbine units at fish passage projects within ±1% of peak turbine efficiency (1% range).

1.7. Juvenile Fish Transportation Plan (JFTP)

Juvenile fish will be transported in accordance with the FOP, FPP, and ESA Section 10 permit. Criteria for collection, holding, and transport of juvenile fish are defined in the *Juvenile Fish Transportation Plan* (JFTP), included in the FPP as **Appendix B**. Other operating criteria for juvenile fish bypass facilities are contained in the project-specific **FPP Sections 2–9**. Additional criteria may be developed as part of the ESA Section 10 permit process and/or in coordination with the TMT. Implementation of the JFTP, including deviation from the plan described in **Appendix B**, will be coordinated through TMT and NOAA Fisheries.

1.8. Turbine Dewatering Fish Protection Protocols at Chief Joseph & Dworshak Dams

The Corps has coordinated and adopted procedures to protect fish during dewatering of turbine units for maintenance at Chief Joseph Dam (**Appendix H**) and Dworshak Dam (**Appendix I**). While these projects do not have fish passage capabilities, ESA-listed salmon and steelhead are present in the tailrace and may become trapped in the turbine unit draft tube during dewatering. The procedures and criteria defined in the Appendices provide fish-protection measures to avoid or minimize impacts on ESA-listed salmonids during turbine dewaterings at these projects.

1.9. Lamprey Passage

The Fish Accords were signed in May 2008 and address actions to protect Pacific lamprey and to improve both juvenile and adult lamprey passage through the FCRPS. Guidance for project operations to improve passage conditions for adult and juvenile lamprey are addressed in FPOM and specific operations for juvenile and adult lamprey are defined in **Appendix D** and in the appropriate project-specific **FPP Sections 2-9**. In-season conflicts between operations for ESA-listed species and Pacific lamprey that are not addressed in the FPP may be reviewed by FPOM and/or TMT.

2. FISH PASSAGE FACILITIES – INSPECTION & REPORTING CRITERIA

Project-specific **FPP Sections 2–9** include detailed inspection and reporting criteria for fish passage facilities at Corps projects. An example of a typical fish passage system is illustrated in **Figure OVE-2**. The Corps provides weekly written inspection reports to NOAA Fisheries Hydropower Program in Portland, Oregon, describing out-of-criteria situations, adjustments made to resolve problems, and a detailed account of impacts on project fish passage and survival. The weekly inspection reports also include summaries of equipment calibrations, adult fish collection channel velocity monitoring, and water temperature monitoring. Equipment which does not require calibration will not routinely be included in the weekly report. The Corps also provides an annual report to NOAA Fisheries that summarizes project O&M, fish passage facility inspections and monitoring, severity of out-of-criteria conditions, and avian predation abatement actions. In addition, the Corps is developing methods to report hourly individual spillbay and turbine unit operations at mainstem projects as called for in the UPA. An acceptable procedure will be coordinated with NOAA Fisheries and other FPOM participants.

2.1. Annual Reporting

Excursions outside of ±1% of peak efficiency turbine operating range are tracked by BPA for each project during the fish passage season. The Corps determines the cause of each excursion and compiles this information approximately bi-weekly. After the fish passage season, the Corps submits an annual report to NOAA Fisheries which describes instances where turbines at lower Columbia and lower Snake River projects operated outside of ±1% of peak efficiency range for significant periods, as defined under the guidelines in **Appendix C**. The intent of excursion reporting is to provide a means for quality assurance for project operations.

2.2. Reporting of Excursions Not Covered by Appendix C

The Corps and BPA will take all reasonable and practicable steps to provide advance notification through the existing interagency coordinating mechanisms prior to departure from the fish-protection measures set out in the 2008 BiOp. If unforeseen circumstances arise that preclude BPA or the Corps from notifying the TMT prior to a variation from required 1% operating criteria and those circumstances are not covered by **Appendix C**, those variations will be reported to the TMT as soon as practicable.

2.3. FPP Implementation & Coordination

Implementation of the FPP requires information exchange and coordination with NOAA Fisheries, BPA, other Federal and state fish agencies, and tribes. The RCC coordinates operations of Corps projects through the TMT that have system-wide effects, such as water management, spill volume, and unit availability. District biologists coordinate through the FPOM on spill patterns, unit priority, adult and juvenile fish facilities, and other project-specific operations that do not have system-wide impacts.

The RCC participates in TMT meetings throughout the year to consider recommendations for river operations to implement the FOP, BiOps, and other recommendations from fish interests. As part of this process, TMT may evaluate research data and advice on whether existing operations are consistent with current study results. These meetings are held in the Corps' Northwestern Division office in Portland, Oregon, and are open to the public. Corps representatives are available at these meetings to discuss the latest weather and runoff forecasts, as well as fish, hydrologic, water quality, and power generation information to assist in planning upcoming operations for fish passage. The Corps evaluates fish operation recommendations to determine impact on overall system operations. See section below regarding TMT coordination.

Corps District and RCC biologists attend monthly FPOM meetings dealing with project-specific issues below (see section below regarding FPOM coordination):

i. Consider recommendations from affected interests;

ii. Provide updates on construction, O&M, research, and other topics;

iii. Develop criteria for the annual FPP;

iv. Coordinate fish passage issues that may require deviation from FPP criteria.

2.4. Agency Responsibilities

2.4.1. U.S. Army Corps of Engineers

i. Coordinate with NOAA Fisheries and USFWS on operations that may impact ESA-listed threatened, endangered, or candidate species;

ii. Prepare annual *Water Management Plan* and seasonal updates in coordination with TMT.

iii. In cooperation with the fish agencies and tribes, provide fish passage monitoring, surveillance, and reporting at Corps projects throughout the migration period;

iv. Provide timely information on all proposed and/or scheduled studies or special operations that may negatively impact or otherwise constrain fish passage or energy production. Discuss unforeseen changes in fish passage operation with fish agencies and tribes;

v. Carry out routine and emergency fish passage operations and maintenance procedures in accordance with criteria in **FPP Sections 2-9** and **Appendix A**;

vi. Conduct the TDG Monitoring Program.

2.4.2. Federal, State and Tribal Fishery Agencies

i. Request spill for fish through TMT to protect ESA-listed species or other species in accordance with the TMT Guidelines;

ii. Through TMT, provide RCC with a spill priority list and recommendations for modifications;

iii. Provide biological monitoring and surveillance reports throughout the migration period from predetermined locations, such as Smolt Monitoring Program sample sites;

iv. Provide status reports on the timing of the downstream migration, including pertinent marked fish release and recovery data, with weekly written reports estimating percentage of runs past key projects;

v. Where biologically and logistically feasible, coordinate hatchery releases to ensure they are protected by regulated fish flows and spills while minimizing impacts on ESA-listed species. Provide and update hatchery release schedules weekly;

vi. Provide recommendations to the operating agencies for maintaining acceptable fish passage conditions. This information can be used to maximize other project uses, including power generation;

vii. Provide information on all proposed and scheduled studies or special operations designed to improve fish passage operations that may affect energy production or project operation. Discuss unforeseen changes with the Corps;

viii. Recommend viable methods and procedures to reduce mortality to migratory and resident fish. This may include such operations as collection and transport of migrants, use of alternate bypass strategies, or other methods to minimize fish mortality;

2.4.3. Bonneville Power Administration

i. Report to RCC on updated load-resource studies during the April-to-September period to supplement the National Weather Service River Forecast Center's runoff volume forecast for fish passage planning assistance.

ii. Provide to RCC, NOAA Fisheries, other fish agencies, and tribes, the BPA estimate of power market impacts of requested spill operations.

iii. Utilize available flexibility of the Federal Columbia River Power System to shape flow requirements, spill priorities, and plant generation consistent with BPA policies and statutory requirements related to fish protection.

iv. Adjust system generation to provide adequate water for fish operation requirements in accordance with the FOP and relevant FCRPS BiOps.

v. Provide project load requests on a real-time/hourly basis that enable the Corps to implement spill priorities.

vi. Provide information on unit operations outside ±1% peak efficiency, as defined in **Appendix C**.

2.4.4. Mid-Columbia Public Utility Districts

i. Operate projects for spill transfer in accordance with provisions of the FPP with at least 1.5 hours notification to start or stop spill.

2.5. FPOM Coordination

Pursuant to the 2008 RPA Action 32, project O&M activities included in the annual FPP are regionally coordinated through FPOM, which includes representatives from the Corps, NOAA Fisheries, USFWS, BPA, state fish agencies (OR, WA, ID), tribes, and other interested parties. The printed FPP is published annually on or about March 1 and is effective year-round, though revisions may be approved through FPOM at any time. Proposed revisions are presented to the relevant project's District Operations biologist for consideration by the Corps in an FPP Change Form[1] that includes a description and justification for the change. The Corps will submit Change Forms to FPOM for a minimum of two weeks to review and provide feedback to the Corps POC. Approved Change Forms will be finalized with comments received and a record of the final action, then amended to the current year's online FPP (if finalized after mid-February) or published in the next printed FPP (if finalized before mid-February). The Corps will provide FPP changes to TMT as necessary for use as part of the overall river operation plan. Sections dealing with special operational requirements will also be included in the Action Agency's annual *Water Management Plan*.

[1] Change Form template is available on the FPP website at: http://www.nwd-wc.usace.army.mil/tmt/documents/fpp/

Project-specific activities under the purview of FPOM that may require deviations from FPP criteria will be fully coordinated in a timely manner. Issues discussed and resolved at FPOM meetings will be considered regionally coordinated upon documentation in the final meeting minutes. Outside of the meeting forum, the coordination procedures below should be followed.

For O&M activities within the District's Operations Division, project personnel will communicate their needs to a District biologist (or other appropriate personnel) who will compile relevant information into a *Memorandum of Coordination*[2] (MOC) that includes a summary of the activity, location, date, time, analyses of potential impacts to ESA-listed species, and potential alternative actions. The District biologist will submit the MOC to FPOM at the next monthly meeting and/or via email, and then if necessary, follow up with appropriate FPOM members via phone or email. For planned O&M, an MOC should be provided to FPOM for review at least two weeks in advance. For unplanned O&M that is not considered an emergency (e.g., equipment failure) the MOC should be provided to FPOM at least three workdays in advance. Emergency O&M may be performed immediately and the MOC submitted to FPOM as soon as possible either prior to or subsequent to the required activity (see section 1.2 above). FPOM members may submit responses to an MOC by the requested due date via email, phone or in person, and all responses will be documented in the final MOC for distribution to FPOM and posting to the FPOM website. The District biologist will forward the final coordinated operation to project personnel, and if necessary, RCC will issue a teletype.

For research and construction activities involving both the Planning and Operations divisions within a District, the Planning Division biologists will typically lead the coordination effort while keeping Operations Division biologists informed and apprised of the proceedings. Research coordination is largely carried out and documented through the Corps' Anadromous Fish Evaluation Program (AFEP). Coordination of new construction or modification of fish facilities is typically carried out and documented through the Fish Facility Design Review Work Group (FFDRWG).

If implementation requires assistance from Project personnel, temporary equipment installation, temporary facility modification, and/or operational changes, then both Planning and Operations biologists will work closely together and with Project personnel and any others necessary to ensure all personnel are continually informed and updated throughout the process.

Following are some of the individuals involved with the FPOM coordination process, as of February 2014 *(*FPOM chair / ** FPOM co-chair*):

i. Corps Portland District, Operations – Bernard Klatte*, Tammy Mackey, Bob Stansell

ii. Corps Portland District, Planning, Programs & Project Mgmt – Mike Langeslay

iii. Corps Walla Walla District, Operations – Ann Setter**, Greg Moody, Ken Fone, John Bailey

iv. Corps Walla Walla District, Planning, Programs & Project Mgmt – Marvin Shutters

[2] *Memorandum of Coordination* (MOC) template is included at the end of this section.

v. Corps Northwestern Division, Reservoir Control Center – Doug Baus, Lisa Wright

vi. Bonneville Power Administration (BPA) – Scott Bettin, Agnes Lut

vii. NOAA Fisheries – Gary Fredricks, Trevor Conder, Bill Hevlin, Ed Meyer

viii. US Fish & Wildlife Service (USFWS) – David Wills

ix. Columbia River Inter-Tribal Fish Commission (CRITFC) – Tom Lorz

x. Oregon Dept. of Fish & Wildlife (ODFW) – Erick Van Dyke, Kathryn Kostow

xi. Washington Dept. of Fish & Wildlife (WDFW) – vacant

xii. Idaho Dept. of Fish & Game (IDFG) – Russ Kiefer

xiii. Fish Passage Center (FPC) – Dave Benner

2.6. TMT Coordination

Actions that may impact fish system-wide will be coordinated and documented through TMT. Actions that may impact fish at a specific project which are a result of actual operations, implementation of FOP/BiOp actions, incidental take, terms and conditions contained in the BiOps, or research projects will be coordinated through the process outlined below. TMT Guidelines are posted as an Appendix to the annual Water Management Plan, available online at: http://www.nwd-wc.usace.army.mil/tmt/documents/wmp/

2.7. Day-to-Day Coordination of FCRPS

Procedures described in the annual Water Management Plan will be used for fish operations. Coordination for system and project operations for flow augmentation and recommended reservoir operations will occur through TMT. This will include operation of turbine units outside of the ±1% peak efficiency range, zero nighttime flow in the Snake River, reservoir operation at minimum operating pool (MOP) or some other specific level, and special operations for implementation of approved research projects as identified in *Special Project Operations & Studies* (**Appendix A**). When reservoirs are not being operated to provide special protection for fish passage, projects may be operated within the full normal operating range.

2.7.1. Fish Spill Management

The Corps will implement fish spill provisions as described in the *FOP* (**Appendix E**), including special TDG conditions for juvenile fish passage. During spill for fish passage season, TDG levels will be monitored and fish will be evaluated for signs of gas bubble trauma by the Corps, NOAA Fisheries, other fish agencies, Tribes, and/or State water quality agencies. Project spill levels will be adjusted as needed based on daily physical and biological monitoring results, and coordinated with TMT and other relevant agencies and tribes.

2.7.2. Special Operations – Fish-Related Requests/Recommendations

Recommendations for special fish operations outside the *Water Management Plan* may be made to RCC. Coordination of these recommendations will be made through the TMT. Recommendations related to project O&M activities requiring special operations will be evaluated for impacts on fish migration and survival. Sufficient lead time will be given for a planned operation, whenever practical, to allow ESA coordination with TMT, NOAA Fisheries, and USFWS. Preferably, as much lead time as possible will be provided for activities requiring immediate action. After-action coordination will occur when advance notice is not possible, such as in emergency actions.

2.7.3. Special Operations – Other Requests

As with Corps O&M requests, all other operational recommendations will be evaluated for impacts on fish migration and survival and effects on other project O&M requirements. Coordination of special operations with NOAA Fisheries, USFWS, other fish agencies, and tribes will occur through TMT. Except as necessary for emergency actions, adequate time will be allowed for evaluation of all project and fish impacts prior to implementation. Coordination of emergencies, as identified in the Emergency Protocols adopted by TMT (Water Management Plan, Appendix 2), will be followed.

2.7.4. Non-Corps Activities

All non-Corps personnel intending to conduct any activity at a Corps facility (e.g., fish handling or minor facility modifications) must have prior written approval from the Corps. This approval must be requested in writing to the Chief, Operations Division, at the appropriate Corps District office that oversees the project. If the activity may affect ESA-listed fish, proof of consultation with NOAA Fisheries or USFWS (Section 10 permit) must be provided. Appropriate State permits must be provided as well for activities that may impact ESA-listed or non-listed fish.

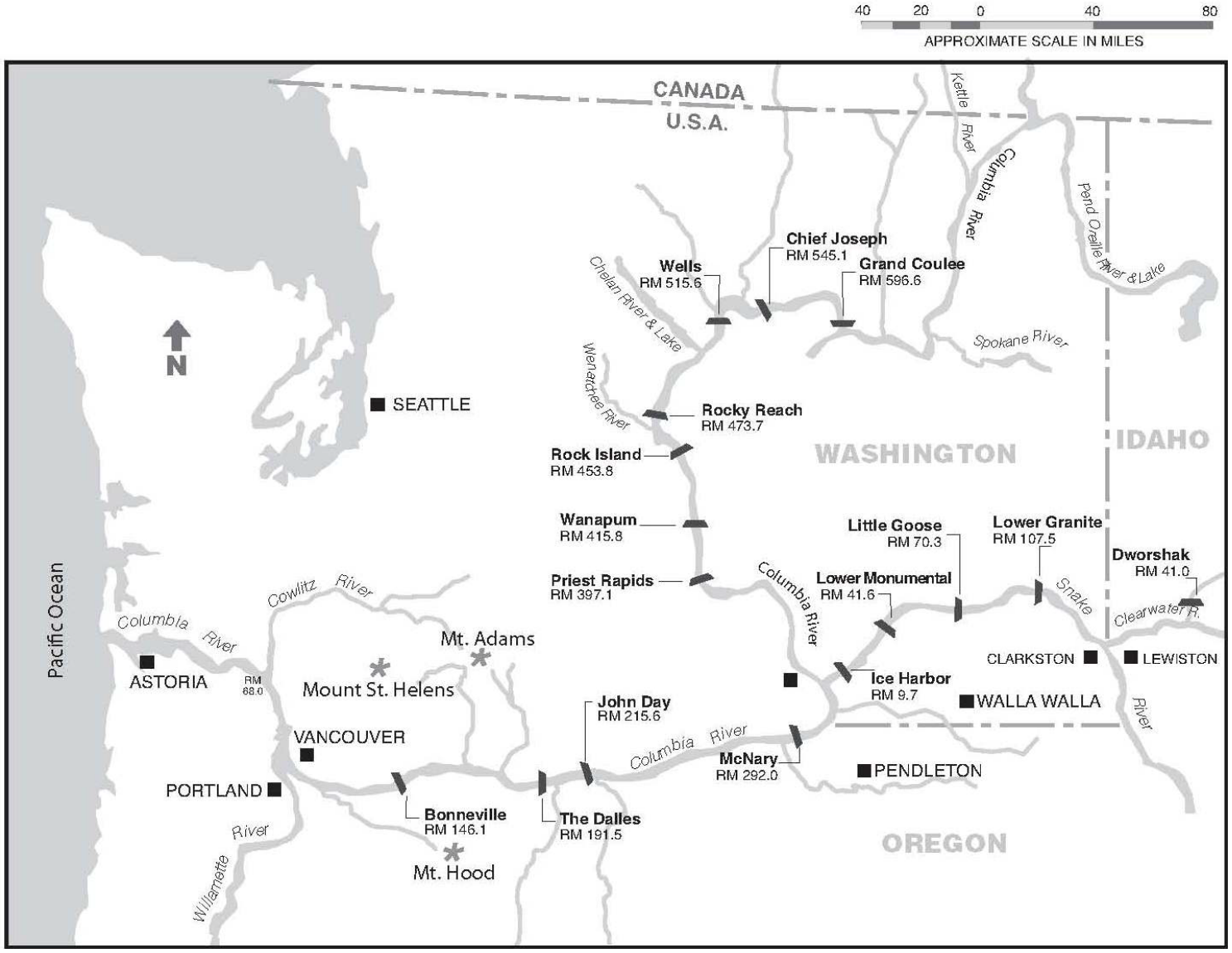

Figure OVE-1. Map of the Federal Columbia River Power System (FCRPS).

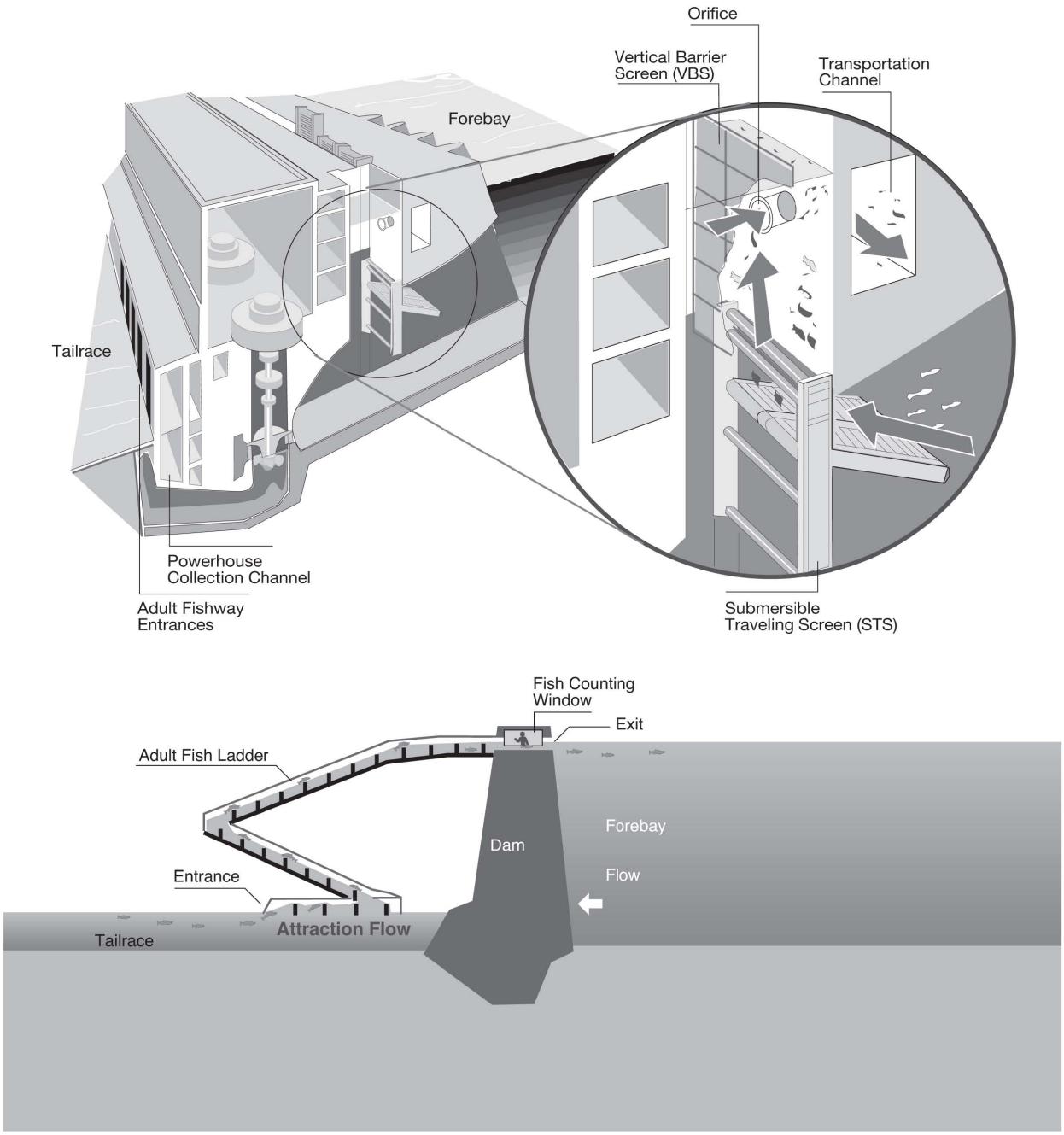

Figure OVE-2 Example Design of Fish Passage Structures at FCRPS Corps Hydropower Projects.

Table OVE-1. Project Information and Operating Criteria for FCRPS Projects on the Lower Columbia and Lower Snake Rivers. [1]

Lower Columbia River				
PROJECT	**Bonneville**	**The Dalles**	**John Day**	**McNary**
Project Acronym [2]	BON	TDA	JDA	MCN
River Mile (RM)	Columbia River - RM 146.1	Columbia River - RM 191.5	Columbia River - RM 215.6	Columbia River - RM 292
Reservoir	Lake Bonneville	Lake Celilo	Lake Umatilla	Lake Wallula
Minimum Instantaneous Flow (kcfs)	80 kcfs	Dec-Feb: 12.5 \ Mar-Nov: 50	Dec-Feb: 12.5 / Mar-Nov: 50	Dec–Feb: 12.5 \ Mar–Nov: 50
Forebay Normal Operating Range (ft)	71.5'-76.5'	155.0'-160.0'	Nov-Jun: 260-265' Jul-Oct: 265-268'	337'-340'
Tailrace Rate of Change Limit (ft)	Apr-Sep: 1.5'/hr, 4'/day Oct-Mar: 3'/hr, 7'/day	3'/hr	3'/hr	1.5'/hr
POWERHOUSE				
Powerhouse Length (ft)	PH1: 1,027' \ PH2: 986'	2,089'	1,975'	1,422'
Turbine Units (#)	PH1: 10 \ PH2: 8 + 2 Fish Units	22 + 2 Fish Units	16	14
Turbine Generating Capacity (MW)	PH1: 535 MW \ PH2: 558 MW	1,808 MW	2,160 MW	980 MW
Powerhouse Hydraulic Capacity (kcfs)	PH1: 136 kcfs \ PH2: 152 kcfs	375 kcfs	322 kcfs	232 kcfs
SPILLWAY				
Spillway Length (ft)	1,450'	1,447'	1,228'	1,310'
Spillbays (#)	18	23	20	22
Spillway Weirs (#)	0	0	2 (Bays 18-19)	2 (Bays 19-20)
Spillway Hydraulic Capacity (kcfs)	1,600 kcfs	2,290 kcfs	2,250 kcfs	2,200 kcfs
NAVIGATION LOCK				
Nav. Lock Length x Width (ft)	675' x 86'	650' x 86'	650' x 86'	683' x 86'
Nav. Lock Maximum Lift (ft)	70'	90'	113'	75'

Lower Snake River				
PROJECT	**Ice Harbor**	**Lower Monumental**	**Little Goose**	**Lower Granite**
Project Acronym *	IHR	LMN	LGS	LWG
River Mile (RM)	Snake River - RM 9.7	Snake River - RM 41.6	Snake River - RM 70.3	Snake River - RM 107.5
Reservoir	Lake Sacajawea	Lake Herbert G. West	Lake Bryan	Lake Lower Granite
Minimum Instantaneous Flow (kcfs)	Dec-Feb: 0 \ Mar-Jul: 9.5 \ Aug-Nov: 7.5	Dec-Feb: 0 \ Mar-Nov: 11.5	Dec-Feb: 0 \ Mar-Nov: 11.5	Dec-Feb: 0 \ Mar-Nov: 11.5
Forebay Normal Operating Range (ft)	437'-440'	537'-540'	633'-638'	733'-738'
Tailrace Rate of Change Limit (ft)	1.5'/hr	1.5'/hr	1.5'/hr	1.5'/hr
POWERHOUSE				
Powerhouse Length (ft)	671'	656'	656'	656'
Turbine Units (#)	6	6	6	6
Turbine Generating Capacity (MW)	603 MW	810 MW	810 MW	810 MW
Powerhouse Hydraulic Capacity (kcfs)	106 kcfs	130 kcfs	130 kcfs	130 kcfs
SPILLWAY				
Spillway Length (ft)	590'	498'	512'	512'
Spillbays (#)	10	8	8	8
Spillway Weirs (#)	1 (Bay 2)	1 (Bay 8)	1 (Bay 1)	1 (Bay 1)
Spillway Hydraulic Capacity (kcfs)	850 kcfs	850 kcfs	850 kcfs	850 kcfs
NAVIGATION LOCK				
Nav. Lock Length x Width (ft)	675' x 86'	666' x 86'	668' x 86'	674' x 86'
Nav. Lock Maximum Lift (ft)	100'	100'	101'	105'

1. Project operating limits and constraints established based on physical plant limitations, legal limits of the authorized purpose(s), and/or to maximize efficiency and benefit of FCRPS reservoir operations. Flexibility of these limits is pursuant to general provisions of the applicable law and any other agreements or contracts. More information available in project-specific sections of the **Fish Passage Plan** and online at:
BON, TDA, JDA - http://www.nwp.usace.army.mil/Locations/ColumbiaRiver.aspx; MCN, IHR, LMN, LGS, LWG - http://www.nww.usace.army.mil/Locations.aspx

2. Project acronym as designated by U.S. Army Corps of Engineers, Northwestern Division, Columbia Basin Water Management Division. Due to the large number of hydropower projects managed by NWD, this acronym may differ from other acronyms used in the region. For example, a common acronym for Lower Granite is LGR. However, this acronym is assigned to another NWD project, thus the official Corps NWD acronym is LWG.

OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS & MAINTENANCE

COORDINATION TITLE- *(filled in by NWP or NWW OD Bio)*

COORDINATION DATE-

PROJECT-

RESPONSE DATE-

Description of the problem

Type of outage required

Impact on facility operation

Dates of impacts/repairs

Length of time for repairs

Expected impacts on fish passage

Comments from agencies

Final results

Please email or call with questions or concerns.

Thank you,