DWIGHT C. HOLTON
Acting United States Attorney
STEPHEN J. ODELL, OSB #90353
Assistant United States Attorney
District of Oregon
600 United States Courthouse
1000 S.W. Third Avenue
Portland, OR 97204-2902
(503) 727-1000

IGNACIA S. MORENO
Assistant Attorney General
SETH M. BARSKY, Section Chief
COBY HOWELL, Trial Attorney
BRIDGET KENNEDY McNEIL, Trial Attorney
Wildlife & Marine Resources Section
U.S. Department of Justice
Environment & Natural Resources Division
c/o U.S. Attorney's Office
1000 SW Third Avenue
Portland, OR 97204-2902
(503) 727-1000
(503) 727-1117 (fx)

Attorneys for Defendants

FILED 11 MAR 24 14:09USDC-ORP

UNITED STATES DISTRICT COURT
DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, *et al.*

Plaintiffs,

v.

NATIONAL MARINE FISHERIES SERVICE, *et al.*

Defendants.

Civil No. 01-640-RE

~~[PROPOSED]~~ ORDER FOR 2011 SPRING OPERATIONS

Federal Defendants submit the following (Proposed) Order for 2011 spring fish operations for the Federal Columbia River Power System ("FCRPS").

In 2005, this Court granted in part, and denied in part, Plaintiffs' motion for

preliminary injunctive relief seeking to alter FCRPS operations during the spring and summer of 2006. See Doc. 1221. The Court adopted the Federal Defendants' proposals for the amount and timing of spring and summer spill at FCRPS dams with two exceptions. Id. at 11. After commencement of spill, Federal Defendants were directed to provide the court with a monthly written report describing the implementation and progress of the spill program. Id.

Similar spring and summer operations were implemented in 2007 pursuant to an agreement between the Bonneville Power Administration (BPA), the Confederated Tribes of the Warm Springs Reservation, the Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes and Bands of the Yakama Nation, and Confederated Tribes of the Colville Indian Reservation. See Doc. 1347 at 3. On May 23, 2007, the Court adopted the 2007 operations agreement as an order of the Court. See Opinion and Order (May 23, 2007).

At a December 12, 2007 status conference, Federal Defendants offered to continue the 2007 spring and summer operations if Plaintiffs would agree to not seek a preliminary injunction until after issuance of the 2008 BiOp. In agreeing to work toward this goal, Plaintiffs' recognized that any agreement for 2008 operations "would essentially continue - subject to discussion of limited changes necessary to accommodate new structures and perform essential research - the court-ordered operations from 2007." See Plaintiffs' January 11, 2008 Letter. The 2008 Fish Operations Plan, incorporated into the Court's Order on 2008 Operation, recognized the operational adjustments necessary to perform this research and accommodate

structural changes. See Doc. 1409, Attachment 1. On February 25, 2008, this Court entered the joint proposed order for 2008 spring and summer operations. Doc. 1423.

In a February 18, 2009 letter to counsel, the Court asked Federal Defendants to agree to "continue recent court-ordered spill operations for Spring 2009." See Doc. 1682 at 2. At the March 6, 2009 hearing, counsel represented that Federal Defendants would abide by the Court's request to continue court-ordered spring spill operations subject to modifications necessary to accommodate new structures and perform essential research. See Tr. at 167. On April 10, 2009, the Court entered an order adopting the parties proposed order. See Doc. 1694.

On February 19, 2010, the Court entered an order granting Federal Defendants' request for a limited, voluntary remand and directed Federal Defendants to complete this remand within three months. In the interests of maintaining the three-month remand schedule, Federal Defendants submitted a nearly identical proposed order for 2010 spring operations as they did in 2009, and the Court entered that order on April 21, 2010. See Doc. 1760. Consistent with past practices and in the interests of resolving the merits of this litigation, Federal Defendants have attached a proposed order for 2011 spring fish operations.

THEREFORE, in light of this prior history and in the interests of avoiding further litigation, the undersigned parties stipulate as follows:

1. Scope: The Court's entry of the proposed order on spring 2011 fish operations shall not be construed as a concession or preliminary assessment of the merits of any parties' claim concerning the 2008 Biological Opinion, Adaptive

Implementation Management Plan (AMIP), Action Agencies' Records of Decision and Amended Records of Decision, and the 2010 Biological Opinion as set forth in the parties' pending cross-motions for summary judgment and supplemental cross-motions for summary judgment.

2. Operations: FCRPS spring 2011 fish operations shall be conducted as set forth in the 2011 Spring Fish Operations Plan, incorporated herein by reference. To the extent hydro-power operations are not specified in the 2011 Spring Fish Operations Plan, Federal Defendants shall operate the FCRPS consistent with the 2010 Biological Opinion, and/or other operative documents necessary to implement that Biological Opinion, unless otherwise specified herein.

3. Timing: This Order applies to spring spill operations for 2011 only and shall continue until the transition date from spring spill operations as set forth in the 2011 Spring Fish Operations Plan, unless this Court issues an opinion on the pending cross-motions for summary judgment prior to that transition date. If the Court issues an opinion granting, in whole or in part, the plaintiffs' pending motions for summary judgment, this Order shall remain in effect until replaced by a further order of the Court. If the Court issues an opinion granting the federal defendants' pending cross-motions for summary judgment, this Order shall terminate on the date the Court issues such a ruling without prejudice to the right of any party to seek emergency or other appropriate relief in any forum.

4. In-Season Adjustments: As set forth in the 2011 Spring Fish Operations Plan, Federal Defendants will utilize the existing Regional Forum committees to make in-season adjustments.

5. Standard Reporting Requirement: Federal Defendants shall provide the court with a written report describing the implementation of the 2011 Spring Fish Operations Plan, beginning May 17, 2011, and monthly intervals thereafter until satisfaction of the earlier of the conditions in Paragraph 3. Should the agencies encounter a situation similar to that which occurred on April 3, 2007, which the Court characterized as "placing power needs before the needs of listed species", Federal Defendants shall notify the Court and the other parties promptly and shall propose mitigation measures, if any, that may be appropriate as soon as practicable.

6. Emergency Reporting Requirements: Federal Defendants shall take all reasonable and practicable steps to notify the Court and the parties prior to any declared system emergency. If unforeseen circumstances arise that preclude Federal Defendants from notifying the Court and the parties prior to a declared system emergency, they shall report those actions directly to the court as soon as practicable.

Dated this 24 day of MARCH ,2011.

James A. Redden
United States District Judge

RESPECTFULLY SUBMITTED,

IGNACIA S. MORENO
Assistant Attorney General
United States Department of Justice
Environment and Natural Resources Division
SETH M. BARSKY
Section Chief

/s/ Coby Howell
COBY HOWELL
Trial Attorney
BRIDGET KENNEDY McNEIL
Trial Attorney
Wildlife & Marine Resources Section
c/o U.S. Attorney's Office
1000 SW Third Avenue
Portland, OR 97204-2902
(503) 727-1000
(503) 727-1117 (fx)

Attorneys for Defendants

2011 Spring Fish Operations Plan

INTRODUCTION

The 2011 Spring Fish Operations Plan (FOP) describes the U.S. Army Corps of Engineers' (Corps) planned operations for fish passage at its mainstem Federal Columbia River Power System (FCRPS) dams during the 2011 spring fish migration season; generally April through June. The 2011 Spring FOP is consistent with the 2010 Court ordered spring spill operations and the adaptive management provisions in the 2010 NOAA Fisheries FCRPS Supplemental Biological Opinion (2010 Supplemental BiOp)[1] and the Corps' Record of Consultation and Statement of Decision (ROCASOD) adopting the project operations contained in the 2010 Supplemental BiOp and Columbia Basin Fish Accords (Accords).

As in 2010, the 2011 Spring FOP incorporates planned project operational adjustments necessary to conduct essential research to evaluate fish passage features during the 2011 spring migration season. Other FCRPS water management actions and project operations not specifically addressed in this document shall be consistent with the 2010 Supplemental BiOp and other guiding operative documents including the 2011 Water Management Plan (WMP), seasonal WMP updates, and the 2011 Fish Passage Plan (FPP). Operations described herein may be adjusted to address in-season developments through discussion and coordination with regional sovereigns.

The following sections describe factors that influence management of fish operations during various runoff conditions, including: total dissolved gas (TDG) management, spillway operations, minimum generation requirements, operations under low flow conditions, navigation safety, juvenile fish transportation operations, specified spring operations for fish at each mainstem project, protocols for fish protection measures related to operational emergencies, coordination with regional entities, and monthly reporting.

GENERAL CONSIDERATIONS FOR FISH OPERATIONS

For planning purposes, the Corps' 2011 Spring FOP assumes average runoff conditions. As actual runoff conditions vary in timing and shape and may be higher or lower than average in any given year, adjustments in fish transportation and/or spill operations (kcfs discharge levels, spill percentages, or spill caps) will be adaptively managed in-season. These in-season changes will be coordinated through the Technical Management Team (TMT) and other appropriate regional forums, to avoid or minimize poor juvenile or adult fish passage conditions, navigation safety concerns, or to accommodate powerhouse and/or transmission system constraints. Actual spill levels may be adaptively managed to

[1] The 2010 Supplemental BiOp incorporates the 2008 NOAA BiOp

accommodate fish research or other conditions and will be coordinated through the TMT and other appropriate regional forums.

TDG Management During Spill for Fish Passage

The Corps will manage spill levels for fish passage to avoid exceeding 120% TDG in project tailraces, and 115% TDG in the forebay of the next project downstream consistent with the current State of Washington TDG saturation upper limits.[2] These limits are referred to as gas caps. The project maximum spill discharge level that meets, but does not exceed the gas cap, is referred to as the spill cap. Gas caps are constant, whereas spill caps may vary daily depending on flow, spill pattern, temperature, and other environmental conditions.

As noted above, the spill levels presented below in Table 2 are planned spill operations and assume average runoff conditions; however, adjustments to these spill rates may be necessary. Reasons for these adjustments may include:

1. Low runoff conditions that may require adjustments in spill level while still meeting project minimum generation requirements.
2. High runoff conditions where flows exceed the powerhouse hydraulic capacity with the specified spill rates.
3. Navigation safety concerns.
4. Generation unit outages that reduce powerhouse capacity.
5. Power system or other emergencies that reduces powerhouse discharge.
6. Lack of power demand resulting in an increase of spill level.

The Corps' Reservoir Control Center (RCC) is responsible for daily management of spill operations responsive to changing TDG conditions. In order to manage gas cap spill levels consistent with the states' TDG saturation limits, the RCC establishes the spill caps for the lower Columbia and Snake River projects on a daily basis throughout the fish passage season so that resultant TDG percent saturation levels are not expected to exceed the 120%/115% TDG limits measured as the average of the highest 12 hourly readings each day.

Within any given day, some hours of measured TDG levels may be higher or lower than the gas caps due to changing environmental conditions (wind, air temperature, etc.). The process of establishing daily spill caps entails reviewing existing hourly data at each dam (including flow, spill, temperature, and TDG levels) and taking into consideration a number of forecast conditions (including total river discharge, powerhouse discharge, wind and temperature forecast, etc.). These data are used as input variables into the System TDG (SYSTDG) model. The SYSTDG model estimates TDG levels expected several days into the future and is a tool integral to daily decision-making when establishing spill caps at individual dams. Spill caps set by RCC and contained in the

[2] In February 2009, the State of Oregon modified its 5-year waiver to remove the 115% forebay TDG limit. However, the Corps will continue to manage to 120% and 115% (the Washington TDG standard) consistent with the 2010 spring court ordered operation in 2011.

daily spill priority list will be met at the projects using the individual project spill pattern(s) contained in the FPP Sections 2 through 9, which most closely correspond to the specified spill level (i.e. may be slightly over or under the specified spill discharge or percent value). During the spring freshet, when river discharge may be greater than project powerhouse hydraulic capacity given the specified Spring FOP spill level, or a lack of power load results in an increase in the spill level, the Corps will attempt to minimize TDG on a system-wide basis. In this case, spill caps are also developed for 125%, 130%, or 135% saturation as a means of minimizing TDG throughout the system.

The Corps will initiate spill at 0001 hours, or shortly after midnight, at each of the projects on the start dates specified in the project sections below. Spill caps will be established at the specified levels and will continue unless conditions require changing to maintain TDG within the upper limits of 120% in the tailwater of a dam and 115% in the forebay of the next project downstream (and at Camas/Washougal). Spill will transition to summer levels at 0001 hours, or shortly before midnight, at each project on the end dates specified. Operations to manage TDG will continue to be coordinated through the TMT.

Spillway Operations

The Action Agencies will meet the specified spill levels to the extent feasible; however, actual hourly spill levels at each dam may be slightly more or less than those specified in Table 2 below. Actual spill levels vary depending on the precision of spill gate settings, flow variations in real time, varying project head (the elevation difference between a project's forebay and tailwater), automatic load following, and other factors.

Operations Considerations:

- Spill discharge levels: Project spill levels listed in Table 2 coincide with specific gate settings in the FPP project spill pattern tables. Due to limits in the precision of spill gates and control devices, short term flow variations, and head changes, it is not always possible to discharge the exact spill levels stated in Table 2, or as stated in RCC spill requests (teletypes) to projects that call for discrete spill discharges. Therefore, spillway gates are opened to the gate settings identified in the FPP project spill pattern tables to provide spill discharge levels that are the closest to the prescribed spill discharge levels.

- Spill percentages: Spill percentages are considered target spill levels. The project control room operator and BPA duty scheduler calculate spill levels to attempt to be within ±1% of the target percentage for the following hour (or more than ±1% at The Dalles and Little Goose dams as specified in FPP Sections 3 and 8 spill pattern tables). Prescribed or specified percentages in Table 2 may not always be attained due to low discharge conditions, periods of minimum generation, spill cap limitations, temporary spill curtailment for navigation safety, and other unavoidable circumstances. Operators and schedulers review the percentages achieved during the

day and adjust spill levels in later hours, with the objective of ending the day with a daily average spill percentage that achieves the specified spill percentage.

Minimum Generation

The Corps has identified minimum generation flow values derived from actual generation records when turbines were operating within ±1% of best efficiency (Table 1). Values stated in Table 1 are approximations that account for varying head or other small adjustments in turbine unit operation that may result in variations from the reported minimum generation flow and spill amount. Conditions that may result in minor variations include:

1. Varying pool elevation: as reservoirs fluctuate within the operating range, flow rates through the generating unit change.
2. Generating unit governor "dead band": the governor controls the number of megawatts the unit should generate, but cannot precisely control a unit discharge; variations may be 1-2% of generation.
3. System disturbances: once a generator is online and connected to the grid, it responds to changes in system voltage and frequency. These changes may cause the unit to increase discharge and generation slightly within an hour. Individual units operate differently from each other and often have unit specific constraints.
4. Generation control systems regulate megawatt (MW) generation only; not discharge through individual turbine units.

All of the lower Snake River powerhouses may be required to keep one generating unit on line at all times for power system reliability under low river discharge conditions, which may result in a reduction of spill at that project. These projects have two “families” of turbines with slightly different capacities – small and large. In most cases during low flow conditions, one of the smaller turbine units (with reduced generation and flow capabilities) will be online. The smaller turbine units are generally numbered 1–3 and are the first priority for operation during the fish passage season. If smaller turbine units are unavailable, larger units may be used. Turbine unit 1 at Little Goose Dam is the first priority unit during fish passage and typically operates at the upper end of the ±1% of best efficiency range for the purpose of providing tailrace conditions that are favorable for juvenile and adult fish passage.

During low river discharge events, the operating unit generally runs at the lower end of the ±1% of best efficiency range. At Lower Monumental Dam however, turbine unit 1 (the first priority unit during fish passage), cannot operate at the low end of the design range because it has welded blades. Ice Harbor turbine units cannot be operated at the lower end of the ±1% of best efficiency range because these units experience cavitation which damages the turbine runner and can be detrimental to fish. Therefore, Ice Harbor turbine units will operate at their lower cavitation limits. Minimum generation flow ranges at McNary, John Day, and The Dalles dams are 50-60 kcfs; and 30-40 kcfs at Bonneville as shown in Table 1.

Table 1.— Minimum generation ranges for turbine units at the four lower Snake and four lower Columbia River dams.

Project	Turbine Units	Minimum Generation (kcfs)
Lower Granite	1-3	11.3-13.1
	4-6	13.5-14.5
Little Goose	1-3	11.3-13.1
	4-6	13.5-14.5
Lower Monumental	1	16.5-19.5
	2-3	11.3-13.1
	4-6	13.5-14.5
Ice Harbor	1, 3-6	8.5-10.3
	2	11.3-13.1
McNary	N/A	50-60
John Day	N/A	50-60
The Dalles	N/A	50-60
Bonneville	N/A	30-40

Low Flow Operations

Low flow operations at lower Snake River projects are triggered when inflow is not sufficient to meet both minimum generation requirements and planned FOP spill levels in Table 2. In these situations, Snake River projects will operate one turbine unit at minimum generation and spill the remainder of flow coming into the project. Columbia River projects will also operate at minimum generation and pass remaining inflow as spill down to minimum spill levels. As flows transition from higher flows to low flows, there may be situations when maintaining minimum generation and the target spill may not be possible on every hour since these projects have limited flexibility. During the transition phase, flows may recede at a higher rate than forecasted and inflows provided by non-Federal projects upstream are often variable and uncertain. The combination of these factors may result in instances where unanticipated changes to inflow cause forebay elevations to go outside of recommended BiOp operating ranges.

Low flow conditions occurring when the navigation lock is being emptied at some projects may temporarily result in the spill percentage falling below the target. While the total spill volume remains constant, the volume of water needed to empty the navigation lock during periods of low flow is a greater percentage of the total flow than when river flows are higher.

At Little Goose Dam, when daily average flows in the lower Snake River are ≤32 kcfs, achieving 30% spill requires switching turbine operations between operating 2 units at the low end of the ±1% of best efficiency range to operating one unit at the high end of the ±1% of best efficiency range. This operation is incompatible with the more constant discharge upstream at Lower Granite Dam. It is also often difficult to achieve the FOP prescribed spill level downstream at Lower Monumental Dam and maintain MOP

operations. In 2010, through coordination with TMT during low flow periods, Little Goose spill operations changed from 30% to a constant spill level of approximately 7-11 kcfs to smooth out Little Goose discharges, meet Lower Monumental spill levels, and maintain the MOP operating range at Little Goose. A similar operation will be implemented in spring 2011 if necessary, depending on river flow.

Operations during Rapid Load Changes

Project operations during hours in which load and/or intermittent generation changes rapidly may result in not meeting planned hourly spill level because projects must be available to respond to within-hour load variability to satisfy North American Electric Reliability Council (NERC) reserve requirements ("on response"). This usually occurs at McNary, John Day and The Dalles dams. In addition to within-hour load variability, projects on response must be able to respond to within hour changes that result from intermittent generation (such as wind generation). During periods of rapidly changing loads and intermittent generation, projects on response may have significant changes in turbine discharge within the hour while the spill quantity remains the same within the hour. Under normal conditions, within-hour load changes occur mostly on hours immediately preceding and after the peak load hours, however, within-hour changes in intermittent generation can occur at any hour of the day. Due to the high variability of within-hour load and intermittent generation, these load swing hours may have a greater instance of reporting actual spill percentages that vary more than the ±1% requirement than other hours.

Turbine Unit Testing around Maintenance Outages

Turbine units may be operationally tested for up to 30 minutes by running the unit at speed no load and various loads within the 1% of best efficiency range to allow pre-maintenance measurements and testing, and to allow all fish to move through the unit. Units may be operationally tested after maintenance or repair efforts but before a unit comes out of a maintenance or forced outage status. Operational testing may consist of running the unit for up to 30 minutes before it is returned to operational status. Operational testing of a unit under maintenance is in addition to a unit in run status (e.g. minimum generation) required for power plant reliability. Operational testing may deviate from unit operating priorities and may use water that would otherwise be used for spill if the running unit for reliability is at the bottom of the ±1% of best efficiency range. Water will be used from the powerhouse allocation if possible, and water diverted from spill for operational testing will be minimized. The Corps will coordinate this testing with the region through the FPOM.

Navigation Safety

Short-term adjustments in spill may be required for navigation safety, primarily at the lower Snake projects, but may also be necessary at the lower Columbia projects. This may include changes in spill patterns, reductions in spill discharge rates, or short-term spill stoppages. In addition, unsteady flow at Little Goose due to switching between

operating one and two units during low flow conditions may impact that project's reservoir elevation and cause inadequate navigation depths at the downstream entrance to the Lower Granite navigation lock. Therefore, adjustments to pool elevation in the Little Goose pool of up to 1.0 ft. above the MOP operating range may be necessary to accommodate safe entrance to the navigation lock at Lower Granite Dam during periods of low flow (approximately 50 kcfs or less) and will be coordinated in TMT. These adjustments may be necessary for both commercial tows and fish barges.

JUVENILE FISH TRANSPORTATION PROGRAM OPERATIONS

As noted above, the Corps' planned spill operations assume average runoff conditions. In previous years, the FOP provided that spill for fish passage would occur under all flow conditions.[3] To improve survival of juvenile migrants, the 2010 Supplemental BiOp calls for an annual review of the previous year's fish survival information and discussion with the Regional Implementation Oversight Group (RIOG) to inform transport/spill operations for the subsequent year. After considering the best available information and taking into account input from regional sovereigns, the Corps has made the determination to continue juvenile fish transportation program operations implemented in 2010 at the Snake River collector projects in 2011. These operations will continue spill specified in Table 2 during the spring regardless of flow conditions. River flow and fish condition will be monitored, and if regional sovereigns recommend adjustments in spill and/or transportation operations that differ from those stated herein, the Corps will use the regional coordination process to make a determination on recommended operational changes.

The following describes the proposed transportation operations for the lower Snake River projects. Detailed descriptions of project and transport facility operations to implement the juvenile fish transportation program are contained in the FPP Appendix B.

Lower Snake River Dams - Operation and Timing

Transportation will be initiated at Lower Granite Dam no earlier than April 20 and no later than May 1. Transportation will start up to 4 days and up to 7 days after the Lower Granite Dam start date at Little Goose and Lower Monumental dams, respectively. The actual start date for Lower Granite, Little Goose, and Lower Monumental dams will be determined through coordination with TMT as informed by the in-season river condition (e.g. river flow and temperature) and the status of the juvenile Chinook and steelhead runs (e.g. percentage of runs having passed the project).

The collection of fish at lower Snake River projects for transportation will commence at 0700 hours on the agreed to start dates. Barging of fish will begin the following day and collected juvenile fish will be barged from each facility on a daily or every-other-day basis (depending on the number of fish) throughout the spring. Transportation operations will be carried out at each project in accordance with all relevant FPP operating criteria.

[3] The 2009 FOP provided: "In exceptionally low water years, when the projected seasonal average flow is less that 70 kcfs, the Corps will begin transportation on April 20 at all three Snake collector projects. Spill for fish passage will occur under all flow conditions."

Transportation and spill operations may be adjusted due to research, conditions at fish collection facilities such as overcrowding or temperature extremes, through the adaptive management process with FPOM and/or TMT to better match juvenile outmigration timing or achieve/maintain performance standards.

SPRING SPILL OPERATIONS

Lower Snake River Projects

Spring spill will begin on April 3 at Lower Granite, Little Goose, Lower Monumental, and Ice Harbor dams. Spring spill operations will continue through June 20. However, fish run timing and research schedules may require an earlier transition date to summer operations to assure that research occurs during the bulk of the migration. Such changes will be coordinated through TMT. Spring spill levels for Snake River dams are shown in Table 2.

Lower Columbia River Projects

Spring spill will begin April 10 at McNary, John Day, The Dalles, and Bonneville dams. Spring spill operations will continue through June 30 at John Day, and The Dalles dams, through June 19 at McNary Dam, and through June 20 at Bonneville Dam. However, fish run timing and research schedules may require earlier transition dates to summer spill operations to assure that research occurs during the bulk of the migration. Such changes if necessary will be coordinated through the TMT. Spring spill operations are shown in Table 2.

PROJECT BY PROJECT SPRING OPERATIONS

The following sections describe 2011 spring spill operations for each project. Included in the descriptions are planned research activities identified in the 2010 Supplemental BiOp. The Corps, regional fishery agencies, and Tribes are interested in the continuation of project research studies under the Corps' Anadromous Fish Evaluation Program (AFEP). These studies have been evaluated through the annual AFEP review process with the regional fishery agencies and Tribes, with the study designs being finalized prior to initiation in 2011. The studies are intended to provide further information on project survival that will help inform the region in making decisions on future operation and configuration actions to improve fish passage and survival and meet BiOp performance standards at the lower Snake and Columbia River dams.

Table 2.— Summary of 2011 spring spill levels at lower Snake and Columbia River projects.[4]

Project	Planned 2011 Spring Spill Operations (Day/Night)	Comments
Lower Granite	20 kcfs/20 kcfs	Same as 2010
Little Goose	30%/30%	Same as 2010
Lower Monumental	Gas Cap/Gas Cap (approximate Gas Cap range: 20-29 kcfs)	Same as 2010
Ice Harbor	**April 3-April 28:** 45 kcfs/Gas Cap **April 28-June 20:** 30%/30% vs. 45 kcfs/Gas Cap (approximate Gas Cap range: 75-95 kcfs)	Same as 2010
McNary	40%/40%	Same as 2010
John Day	**Pre-test:** 30%/30% **Testing:** 30%/30% and 40%/40%	Same as 2010
The Dalles	40%/40%	Same as 2010
Bonneville	100 kcfs/100 kcfs	Same as 2010

Lower Granite

Spring Spill Operations April 3 through June 20: 20 kcfs 24 hours per day.

Changes in Operations for Research Purposes:

- Spring research operations: There are no special spill operations for research planned in 2011. Established spill patterns as described in FPP Section 9 will be used.

Operational Considerations:

- Lack of power load or unexpected unit outages could cause involuntary spill at higher total river discharges that could result in exceeding the gas cap limits.
- During periods of high spring runoff when involuntary spill occurs, there may be periods where spill levels create unsafe hydraulic conditions for commercial, non-commercial, and fish transportation barges entering and exiting the tailrace and/or while moored at the fish loading facility. If such runoff conditions occur, spill may

[4] Table 2 displays in summary form planned spring spill operations, however, more specific detail governing project operations is in the section entitled "Spring Fish Operations By Project."

be reduced temporarily when fish transport barges approach or leave the barge docking area or are moored at loading facilities. If conditions warrant a spill reduction for any navigational passage, Lower Granite pool MOP elevation restrictions may be temporarily exceeded until the barge/vessel exits the tailrace safely and spill resumes.

- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Maintenance dates are subject to change.

Little Goose

Spring Spill Operations April 3 through June 20: 30% spill 24 hours per day with the spillway weir in service by April 4.

Changes in Operations for Research Purposes:

- Spring research operations: There are no special spill operations for research planned in 2011. Established spill patterns as described in FPP Section 8 will be used.

Operational Considerations:

- Daily average flows in the lower Snake River of ≤32 kcfs can result in incompatible operations with Lower Monumental Dam and cause spill quantity fluctuations. Alternative Little Goose operations to resolve this issue are described in the Low Flow Operations section above and will be coordinated through the TMT.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Maintenance dates are subject to change.
- Turbine Unit 1 Operation: Operating range will be set within the GDACS program for Little Goose Dam to restrict Turbine Unit 1 operation to approximately the upper 25% of the 1% of best efficiency range (about 16-17.5 kcfs). This will ensure a strong current along the south shore to counter the strong eddy that forms in the tailrace during certain spill conditions. A strong south shore current in the tailrace is important for both adult fish passage and juvenile fish egress. If low flow conditions occur in the spring, the full ±1% of best efficiency range will be restored to minimize impacts on spill levels.

Lower Monumental

Spring Spill Operations April 3 through approximately June 20: Spill to the 115/120% TDG spill cap 24 hours per day.

Changes in Operations for Research Purposes:

- Spring research operations: There are no special spill operations for research planned in 2011. The "bulk" spill pattern as described in FPP Section 7 will be used. Based on previous years' study results, dam survival is higher using the "bulk" spill pattern compared to the "uniform" spill pattern.

Operational Considerations:

- Daily average flows of ≤32 kcfs can result in incompatible operations with Little Goose Dam and may cause spill quantity fluctuations.
- Transit of the juvenile fish barge across the Lower Monumental tailrace, then docking at and departing from the fish collection facility, may require spill level to be reduced due to safety concerns. The towboat captain may request that spill level be reduced or eliminated during transit. During juvenile fish loading operations, spill is typically reduced to 15 kcfs, but can be reduced further if necessary for safety reasons. Barge loading duration can be up to 3.5 hours. Because of the time needed to complete loading at Lower Monumental, the Little Goose Project personnel will notify the Lower Monumental personnel when the fish barge departs from Little Goose. This ensures that BPA scheduling is provided advance notice for spill control at Lower Monumental Dam. Reducing spill may cause the Lower Monumental pool to briefly operate outside of MOP conditions.
- Operating units within the 1% of best efficiency range translates to as much as 19 kcfs discharge for each of the 6 turbine units, for a maximum hydraulic capacity of approximately 114 kcfs. The expected spill cap is roughly 27 kcfs (but varies depending on total river discharge). Therefore, if total river discharge is greater than 141 kcfs the gas cap will be exceeded. Either lack of power load or unit outages can also cause forced spill above spill cap limits at higher total river discharges.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Maintenance dates are subject to change.

Ice Harbor

Spring Spill Operations April 3 through June 20: Spill will begin at 45 kcfs day/spill cap night on April 3 and continue until April 28. On April 28, spill will alternate between 45 kcfs day/spill cap night and 30% /30% with the SW operating and continue through the spring season. Nighttime spill hours are 1800–0500.

Changes in Operations for Research Purposes:

- Spring research operations: There are no special spill operations for research planned in 2011. Spill patterns as described in FPP Section 6 will be used.

Operational Considerations:

- Spill operation treatments may be rearranged within a week throughout the season. If rearrangement of treatments occurs, the total number of each spill level treatment for the spring season will not change. The flexibility to rearrange treatments during periods of higher power demand may alleviate the need to declare a power emergency.
- Powerhouse capacity at Ice Harbor is approximately 94 kcfs with all 6 units operating within the 1% of best efficiency range, while spill cap rates are about 100 kcfs. If

total river flows exceed about 194 kcfs, TDG levels may exceed the water quality standards set by the States of Oregon and Washington.

- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.
- Submersible Traveling Screens (STSs) will be installed by April 1. The normal juvenile bypass operation will be to route fish through the full flow bypass pipe, which has interrogation capability to monitor for PIT tags. From April 1 through July 31, juvenile fish will be sampled every 3 to 5 days to monitor fish condition and then bypassed to the river. Sampling activity may be terminated early should juvenile bypass fish numbers drop to the point where valid sampling is no longer feasible (100 fish of the most dominant species present are needed to properly assess fish condition). Sampling may also cease if the cumulative number of fish sampled for the season reach the permitted maximum.

McNary

Spring Spill Operations April 10 – approximately June 19: 40% spill 24 hours per day with the two spillway weirs operating. A spillway weir will be operated in both spillbay 19 and spillbay 20 for the period April 10 thru June 6. Both spillbay weirs will be removed from service by June 6 for the benefit of subyearling Chinook. This operational change will be coordinated through FFDRWG, FPOM, the Tribes, and NOAA. Temporary spill pattern changes to allow removal of the spillway weirs will occur, however spill will continue at 40% during the spillway weir removal process. Following removal of the spillway weirs, the spill pattern contained in Table MCN-10 in FPP section 5 will be used for the remainder of the spring.

Changes in Operations for Research Purposes:

- Spring research operations: There are no special spill operations for research planned in 2011. Spill patterns as described in FPP Section 5 will be used.

Operational Considerations:

- Juvenile fish collected at McNary during the spring FOP implementation period will be bypassed to the river. The normal operation will be to bypass fish through the full flow bypass pipe, which has interrogation capability to monitor for PIT tags. Every other day, however, in order to sample fish for the Smolt Monitoring Program, fish will be routed through the separator, interrogated for PIT tags, and then bypassed to the river.
- All extended-length submersible bar screens (ESBSs) at McNary will be installed by April 15 as agreed to in consultation with FPOM, the Tribes, and NOAA. This is part of the Corps' consideration of lifting (or waiting to install) some turbine intake screens during periods of significant juvenile lamprey passage. Effects to both salmon and lamprey have been considered. Although there are some adverse impacts to migrating salmon from this delay in screen installation, regional sovereigns have considered this acceptable in balancing the needs of multiple species.

- During the periods when total river discharge exceeds approximately 320 kcfs, involuntary spill in excess of the States' TDG limits for fish passage may occur.
- In addition, low power demand may also necessitate involuntary spill at total river discharge of less than 320 kcfs.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.

John Day

Spring Spill Operations April 10 – June 30: 30% spill 24 hours per day prior to testing, then 30% spill and 40% spill 24 hours per day during the test. Spill levels will alternate in a random 4-day block with two-day treatments. Spill level changes will occur at 0600 hours.

Changes in Operations for Research Purposes:

- Spill duration for performance standard testing: Testing in late April through early June. The dates of testing will be dependent on the size of fish, fish availability, and the number of treatments needed for testing. Final dates for testing will be coordinated through the SRWG.
- Spring research operations: Performance standard testing at 30% and 40% spill will occur in spring 2011 at John Day Dam.
- Objectives of the biological test: The objectives of the test are to assess passage distribution and efficiency metrics, forebay retention and tailrace egress times, and dam survival for yearling Chinook, and juvenile steelhead to determine if juvenile dam survival at 30% and/or 40% spill under the current project configuration meets or exceeds the juvenile dam survival performance standard for spring migrants (96%) specified in the 2010 Supplemental BiOp.
- Spill pattern during biological test: Spill patterns as described in FPP section 4 will be used.

Operational Considerations:

- Unit outages will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. Dates are subject to change.
- Unit outages and spillway outages may be required to repair hydrophones and other research equipment. These will be coordinated through FPOM and TMT as needed.

The Dalles

Spring Spill Operations April 10 – June 30: 40% spill 24 hours per day.

Changes in Operations for Research Purposes:

- Spring research operations: Performance standard testing at 40% spill will occur in spring 2011 at The Dalles Dam.

- Objectives of the biological test: The objectives of the test are to assess passage distribution and efficiency metrics, forebay retention and tailrace egress times, and dam survival for yearling Chinook, and juvenile steelhead to determine if juvenile dam survival at 40% spill under the current project configuration meets the juvenile dam survival performance standard for spring migrants (96%) specified in the 2010 Supplemental BiOp.
- Spill pattern during the biological test: Spill patterns developed for use with the new spillwall and included in FPP section 3 will be used.

Operational Considerations:

- If total river discharge is between 90 and 150 kcfs, the spill percentage could range from 38.6 to 41.4 percent due to the new spill patterns developed for use with the newly completed spillwall.
- If the total river discharge is between 150 and 300 kcfs, the spill percentage could range from 38.9 to 41.2 percent due to the new spill patterns developed for use with the newly completed spillwall.
- If the total river discharge is between 300 and 420 kcfs, the spill percentage could range from 38.4 to 41.0.
- At no time is spill recommended on the south side of the spillway (Bays 14-22) as this creates a poor tailrace egress condition for spillway-passed fish.
- Spill bays 10, 11, 13, 16, 18, 19, and 23 are not operational due to wire rope, structural and concrete erosion concerns.
- The spill pattern in the FPP is based on a nominal Bonneville forebay elevation of 74 feet.
- Unit outages will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. Dates are subject to change.

Bonneville

Spring Spill Operations April 10 – June 20: 100 kcfs spill 24 hours per day.

Changes in Operations for Research Purposes:

- Spring research operations: Performance standard testing at 100 kcfs spill will occur in spring 2011 at Bonneville Dam.
- Objectives of the biological test: The objectives of the test are to assess passage distribution and efficiency metrics, forebay retention and tailrace egress times, and dam survival for yearling Chinook, and juvenile steelhead to determine if juvenile dam survival at 100 kcfs spill under the current project configuration meets the juvenile dam survival performance standard for spring migrants (96%) specified in the 2010 Supplemental BiOp.
- Spill pattern during biological test: Spill patterns for 100 kcfs as described in FPP section 2 will be used.

Operational Considerations:

- Minimum spill discharge rate is 50 kcfs however, under extreme low flow conditions lower spill levels may be considered and coordinated through the TMT. This is to provide acceptable juvenile fish egress conditions in the tailrace.
- At total spring flows less than about 135 kcfs, spill will be less than 100 kcfs to maintain minimum powerhouse generation of 30 kcfs plus fish ladder and facility spill (e.g. second powerhouse corner collector, first powerhouse sluiceway).
- The TMT will consider the possible effects of TDG on emerging chum salmon downstream of Bonneville Dam. The TMT may request special operations such as flow increases or spill reductions to protect ESA-listed fish.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Maintenance dates are subject to change.
- Actual spill levels at Bonneville Dam may range from 1 to 3 kcfs lower or higher than specified in Table 2. A number of factors influence this including hydraulic efficiency, exact gate opening calibration, spillway gate hoist cable stretch due to temperature changes, and forebay elevation (a higher forebay results in a greater volume of spill since more water can pass under the spill gate).
- The second powerhouse Corner Collector (5 kcfs discharge) will operate from the morning of April 10 through the remainder of the spring season as coordinated through the FPOM.

TRANSPORT, LATENT MORTALITY, AND AVIAN RESEARCH

Seasonal Effects of Transport

A study will be conducted to determine seasonal effects of transporting fish from the Snake River to optimize a transportation strategy. At Lower Granite, fish will be collected for this study starting on April 4, with marking beginning on April 5. Depending on the number of fish available, fish will be collected 1-2 days with tagging occurring on the day following collection. A barge will leave each Thursday morning with all fish collected during the previous 1-3 days. By barging all fish (minus the in-river group) during 1 to 3 days of collection, barge densities will be maintained at a level similar to what would occur under normal transport operations that time of year. This pattern will occur in the weeks preceding general transportation and will be incorporated into general transportation once that operation begins. The desired transported sample size is 6,000 wild Chinook and 4,000 - 6,000 wild steelhead weekly for approximately eight weeks.

Latent Mortality

A study will be conducted to evaluate latent mortality associated with passage through Snake River dams. The goal of this study is to determine whether migration through Snake River dams and reservoirs causes extra mortality in Snake River yearling (spring/summer) Chinook salmon smolts. Specifically, the study will determine if life-cycle survival downstream from McNary Dam is significantly higher for yearling

hatchery Chinook salmon released into the Ice Harbor Dam tailrace than for counterparts which must pass three additional dams and reservoirs after release into the Lower Granite Dam tailrace. Fish will be collected at Lower Granite Dam beginning approximately April 20, with the goal of tagging approximately 74,000 smolts of which 45,000 will be released into the tailrace of Lower Granite Dam, and 29,000 transported by truck and released in the tailrace of Ice Harbor Dam.

EMERGENCY PROTOCOLS

The Corps and the Bureau of Reclamation will operate the projects in emergency situations in accordance with the WMP Emergency Protocol (WMP Appendix 1). This protocol identifies the process the Action Agencies will use in the event of an emergency concerning the operation of FCRPS that impacts planned fish protection measures. The most recent version of the Emergency Protocols is located at: http://www.nwd-wc.usace.army.mil/tmt/documents/wmp/2010/final/emerproto

COORDINATION

To make adjustments in response to changes in conditions, the Corps will utilize the existing regional coordination committees. Changes in spill rates when flow conditions are higher or lower than anticipated will be coordinated through the TMT. This could include potential issues and adjustments to the juvenile fish transportation program. Spill patterns and biological testing protocols that have not been coordinated to date will be finalized through the Corps' AFEP subcommittees, which include the SRWG, FFDRWG, and FPOM.

REPORTING

The Corps will provide periodic in-season updates to TMT members on the implementation of 2011 fish passage operations. The updates will include the following information:

- the hourly flow through the powerhouse;
- the hourly flow over the spillway compared to the spill target for that hour; and,
- the resultant 12-hour average TDG for the tailwater at each project and for the next project's forebay downstream.

The updates will also provide information on substantial issues that arise as a result of the spill program (e.g. Little Goose adult passage issues in 2005 and 2007), and will address any emergency situations that arise.

The Corps will continue to provide the following data to the public regarding project flow, spill rate, TDG level, and water temperature.

- Flow and spill quantity data for the lower Snake and Columbia River dams are posted to the following website every hour: http://www.nwd-wc.usace.army.mil/report/projdata.htm

- Water Quality: TDG and water temperature data are posted to the following website every hour: http://www.nwd-wc.usace.army.mil/report/total.html. These data are received via satellite from fixed monitoring sites in the Columbia and Snake rivers every hour, and placed on a Corps public website upon receipt. Using the hourly TDG readings for each station in the lower Snake and Columbia rivers, the Corps will calculate both the highest and highest consecutive 12-hour average TDG levels daily for each station. These averages are reported at:
  http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/wa/