

# 2014 Water Management Plan Seasonal Update November 26, 2013

## 1. Introduction

The annual Water Management Plan (WMP) is developed prior to the implementation of operational measures identified in the BiOp. The WMP is also developed prior to the receipt of any seasonal information that may determine how many of the operation measures are implemented. The Seasonal Update is intended to supplement the WMP with more detailed information on operations as the water year progresses. Each section of the Seasonal Update will be updated when information is available and finalized when no further information is available. The first update for the primary elements of Fall and Winter will be posted on November 1<sup>st</sup> of each year. The first update for the primary elements of Spring and Summer will be posted by March 1<sup>st</sup> of each year.

The elements and operations included in the Seasonal Update are generally the same as have been previously presented in the Fall/Winter and Spring/Summer Updates to the WMP. The change to update in this manner is intended to present better continuity for tracking operations as they change throughout and across each season. The elements and operations described in the Seasonal Update and the approximate schedule for updates and finalization are as displayed in Table 1.

**Table 1. Schedule for update and finalization of Seasonal Update elements and operations.**

Section	Element	Begins	Finalized	Last Updated
	Current Conditions (e.g., WSF, Streamflows)	October	July	
	Seasonal Flow Objectives	April	August	
	Flood Control	January	June	
	Storage Project Operations	September	September	
	Water Quality (Spill Priority Lists)	January	December	November 26, 2013
	<b>Specific Operations</b>	<b>Start Date</b>	<b>End Date</b>	<b>Last Updated</b>
	Chum Flows (Bonneville Dam)	November 1	April 10	November 26, 2013
	Spring Creek Hatchery Releases (Bonneville Dam)	April	May	
	Burbot Flows (Libby Dam)	November	December 30	November 10, 2010
	Upper Snake Flow Augmentation	April 1	August 31	
	Lake Pend Oreille Kokanee (Albeni Falls Dam)	September 1	December 30	November 26, 2013
	Transportation	May 1	September 30	
	Spill Operations	April 3	August 31	
	Fish Passage Research	March	October	
	Snake River Zero Generation	December	February	November 26,

				2013
	Hanford Reach Fall Chinook Protection	November	June	November 26, 2013

## 2. Seasonal Update Elements and Specific Operations

### 2.1. Current Conditions

#### Water Supply Forecasts – NWRFC

The final water supply forecast (WSF) is defined as the forecast posted on NOAA’s Northwest River Forecast Center (NWRFC) website at 5:00 pm Pacific Standard Time on the 5<sup>th</sup> business day of the month (except April 8, as per the official WSF calendar). NWRFC water supply forecasts are available on the following website: <http://www.nwrfc.noaa.gov/ws/>

**Table 2. The Dalles Dam Final Water Supply Forecasts.**

Forecast Issue Date	January-July 2014		April-August 2014	
	Volume (maf)	% of 30-year Average (101.4 maf)	Volume (maf)	% of 30-year Average (87.5 maf)
January				
February				
March				
April				
May				
June				
July				

**Table 3. Grand Coulee Dam Final Water Supply Forecasts.**

Forecast Issue Date	January-July 2014		April-August 2014	
	Volume (maf)	% of 30-year Average (59.6 maf)	Volume (maf)	% of 30-year Average (56.8 maf)
January				
February				
March				
April				
May				
June				
July				

**Table 4. Lower Granite Dam Final Water Supply Forecasts.**

Forecast Issue Date	January-July 2014		April-August 2014	
	Volume (maf)	% of 30-year Average (27.4 maf)	Volume (maf)	% of 30-year Average (21.1 maf)
January				
February				
March				
April				
May				
June				
July				

## Water Supply Forecasts - Corps

Water supply forecasts for Libby and Dworshak dams are produced by the Corps' Seattle and Portland Districts, respectively. Corps forecasts are available on the following website:

<http://www.nwd-wc.usace.army.mil/report/colriverflood.htm>

**Table 5. Libby Dam Water Final Supply Forecasts.**

Forecast Issue Date	April-August 2014	
	Volume (kaf)	% of 70-year Average (6,337 kaf)
November		
December		
January		
February		
March		
April		
May		
June		

**Table 6. Dworshak Dam Final Water Supply Forecasts.**

Forecast Issue Date	April-July 2014	
	Volume (kaf)	% of 70-year Average (2,683 kaf)
December		
January		
February		
March		
April		
May		
June		

## Water Supply Forecasts – Bureau of Reclamation

Water supply forecasts for Hungry Horse Dam are produced by the Bureau of Reclamation.

**Table 7. Hungry Horse Dam Final Water Supply Forecasts.**

Forecast Issue Date	April-August 2014		January-July 2014		May-September 2014	
	Volume (kaf)	% of 30-year Average (2,070 kaf)	Volume (kaf)	% of 30-year Average (2,224 kaf)	Volume (kaf)	% of 30-year Average (1,835 kaf)
January						
February						
March						
April						
May						
June						

**Weekly Weather and Precipitation Retrospectives**

Week	Weekly Weather / Precipitation Retrospective
October 7, 2013	<b>Temperatures:</b> Below average US basins; slightly above average in BC <b>Precipitation:</b> Well below average. <b>Streamflows:</b> Flat or receding.
October 14, 2013	<b>Temperatures:</b> Near average. <b>Precipitation:</b> Virtually none. <b>Streamflows:</b> Slowly receding. Baseflows are still higher than usual due to the record September rainfall.
October 21, 2013	<b>Temperatures:</b> Above average. <b>Precipitation:</b> Virtually none through Saturday, followed by light precip northwest half on Sunday. <b>Streamflows:</b> Slowly receding, although base flows remain a little higher than usual.
October 28, 2013	<b>Temperatures:</b> Below average initially, rose to above average Thu-Fri, then fell back below average by Sunday. <b>Precipitation:</b> Slightly above average. <b>Streamflows:</b> Very modest flow increases on the lower Columbia and Willamette, otherwise generally flat.
November 4, 2013	<b>Temperatures:</b> Near average. <b>Precipitation:</b> Above average BC; below average in US. <b>Streamflows:</b> Small rises on the lower Columbia, Willamette, and Snake basins. Flat elsewhere.
November 11, 2013	<b>Temperatures:</b> Above average. <b>Precipitation:</b> Above average in BC and western MT; below average elsewhere. <b>Streamflows:</b> Mostly flat.
November 18, 2013	<b>Temperatures:</b> Below average. <b>Precipitation:</b> Near to slightly above average east of the Cascades; below average west. <b>Streamflows:</b> Generally flat, except for brief flow increases into the Willamette, lower Columbia, and Spokane/Clearwater basins early in the week.
November 25, 2013	
December 2, 2013	
December 9, 2013	
December 16, 2013	
December 23, 2013	
December 30, 2013	
January 6, 2014	
January 13, 2014	
January 20, 2014	
January 27, 2014	
February 3, 2014	
February 10, 2014	
February 17, 2014	

February 24, 2014
March 3, 2014
March 10, 2014
March 17, 2014
March 24, 2014
March 31, 2014
April 7, 2014
April 14, 2014
April 21, 2014
April 28, 2014
May 5, 2014
May 12, 2014
May 19, 2014
May 26, 2014
June 2, 2014
June 9, 2014
June 16, 2014
June 23, 2014
June 30, 2014
July 7, 2014
July 14, 2014
July 21, 2014
July 28, 2014
August 4, 2014
August 11, 2014
August 18, 2014
August 25, 2014
September 1, 2014
September 8, 2014
September 15, 2014
September 22, 2014
September 29, 2014

## 2.2. Seasonal Flow Objectives

Project	Planning Dates	BiOp Season Average Flow Objective – (kcfs)	Season Average Flow to date (kcfs)
Priest Rapids	Spring 4/10–6/30	135 kcfs	
McNary	Spring 4/10–6/30	220-260 kcfs <sup>i</sup>	
	Summer 7/1–8/31	200 kcfs	
Lower Granite	Spring 4/3–6/20	85-100 kcfs <sup>i</sup>	
	Summer 6/21–8/31	50-55 kcfs <sup>ii</sup>	

i. Varies according to NWRFC April forecast.

ii. Varies according to NWRFC June forecast.

## 2.3. Flood Control

Flood Control Elevations and April 10 Objective Elevations per each forecast period are listed in the table below. Forecasted flood control elevations will be calculated beginning in December

after the Libby and Dworshak water supply forecasts are available. Subsequent forecasted flood controls will be updated after the final water supply forecasts are available January-April.

Grand Coulee and all Canadian projects will be operated for standard flood control. Hungry Horse and Libby will be operated for Variable Q (VARQ) Flood Control. Beginning in January, the Corps calculates Upper Rule Curve elevations based on the monthly official final forecasts. Projects are operated using these elevations as an upper limit, with the objective of reaching their spring refill elevations. Detailed flood control operations are available at the following website: <http://www.nwd-wc.usace.army.mil/report/colsum>.

*The April 10 elevations shown in the table below are calculated by linear interpolation between the March 31 and April 15 forecasted flood control elevations.*

<b>Project</b>	<b>Elevation Date Objective</b>	<b>Dec</b>	<b>Jan</b>	<b>Feb</b>	<b>Mar</b>	<b>Apr</b>
<b>Libby</b>	<b>Jan 31</b>					
	<b>Feb 28</b>					
	<b>March 31</b>					
	<b>April 10</b>					
	<b>April 15</b>					
	<b>April 30</b>					
<b>Hungry Horse</b>	<b>Jan 31</b>					
	<b>Feb 28</b>					
	<b>March 31</b>					
	<b>April 10</b>					
	<b>April 15</b>					
	<b>April 30</b>					
<b>Grand Coulee</b>	<b>Jan 31</b>					
	<b>Feb 28</b>					
	<b>March 31</b>					
	<b>April 10</b>					
	<b>April 15</b>					
	<b>April 30</b>					
<b>Brownlee</b>	<b>Jan 31</b>					
	<b>Feb 28</b>					
	<b>March 31</b>					
	<b>April 15</b>					
	<b>April 30</b>					
<b>Dworshak</b>	<b>Jan 31</b>					
	<b>Feb 28</b>					
	<b>March 31</b>					
	<b>April 10</b>					
	<b>April 15</b>					
	<b>April 30</b>					

## ***2.4. Storage Project Operations***

### **Libby Dam**

**Bull Trout Flows:** Bull trout minimum flows are specified in the 2006 Libby Sturgeon Biological Opinion (2006 BiOp) and may be found in Table 9 on page 32 of the Water Management Plan on the following website:

<http://www.nwd->

[wc.usace.army.mil/tmt/documents/wmp/2013/Final/20121231\\_1100\\_WMP\\_Final.pdf](http://www.usace.army.mil/tmt/documents/wmp/2013/Final/20121231_1100_WMP_Final.pdf).

**April 10 and Refill Objectives:** This section will be updated throughout the season as new forecast information becomes available.

**Summer Draft Limit:** From August through October in 2014-2017, the AAs will be operating Libby Dam in coordination with the Kootenai Tribe of Idaho in order to provide conditions for construction of a suite of Kootenai River Habitat Restoration Projects (KRHRP). In order to accommodate this operation, the AAs will coordinate with TMT on the actual operation to reach the BiOp 30 September elevation of either 2,439 or 2,449 ft.

### **Hungry Horse Dam**

**Water Supply Forecast and Minimum Flows:** The minimum flow requirements are measured at two locations the South Fork Flathead River below Hungry Horse Dam and the Flathead River at Columbia Falls. The minimum flows will be determined monthly, beginning in January, with the Bureau of Reclamation's WSF forecast for Hungry Horse Reservoir for the period of April 1 to August 31. The final flow levels, for the remainder of the calendar year, are based on the March Final forecast. The Bureau of Reclamation's March 2013 Final WSF for April–August was 1,994 kaf (103% of average) which set the minimum flow requirements below Hungry Horse and at Columbia Falls at 900 cfs and 3,500 cfs, respectively. The minimum flow requirements are set for the rest of the calendar year and will be updated following the January 2014 Final forecast.

**April 10 and June 30 Refill Objectives:** This section will be updated throughout the season as new forecast information becomes available.

**Summer Draft Limit:** The summer reservoir draft limit at Hungry Horse is 3,550 ft. (10 ft. from full) by September 30, except in the lowest 20th percentile of water years (The Dalles April-August <72.2 maf) when the draft limit is elevation 3,540 ft. (20 ft. from full) by September 30. The RFC's May Final April-August forecast is used to set the official draft limit.

### **Grand Coulee Dam**

**April 10 and June 30 refill Objective:** This section will be updated throughout the season as new forecast information becomes available.

### **The Lake Roosevelt Incremental Storage Release Program**

This section will be updated throughout the season as new information becomes available.

**Table 8. Lake Roosevelt releases requested for 2014.**

<b>“Bucket”</b>	<b>2014 Releases (acre-feet)</b>	<b>Total Lake Roosevelt Incremental Storage Releases Program (acre-feet)</b>
Odessa		
M&I		
Instream Flow		

### **Dworshak Dam**

The Corps will update in June or as soon as information becomes available.

### ***2.5. Water Quality***

The AAs have coordinated the following spill priority lists with the TMT to date:

- **September 1 – December 31, 2013:** Winter spill priority list coordinated during the August 21, 2013 TMT meeting may be found on the following website:  
<http://www.nwd-wc.usace.army.mil/tmt/agendas/2013/>

### ***2.6. Burbot Spawning Flows (Libby Dam)***

Under the terms of an MOU prepared in 2005 by the Kootenai Valley Resource Initiative (KVRI) and signed by the Corps, the selective withdrawal gate system at Libby Dam has been set to release cool water in November and December, before temperature stratification limits the temperature control capability. The purpose of this operation is to provide cooler river temperatures downstream Libby Dam (closer to normative thermal conditions). This operation will likely result in November and December temperatures being slightly cooler than the existing selective withdrawal temperature rule curve. Corps staff at Libby Dam removed selective withdrawal gates incrementally during late October to assure that daily temperature change remains within 2° F per day; gates were removed systematically to slowly lower river temperature by early November (a span of about 8° F). Temperature will not be minimized this fall until isothermal conditions develop due to constraints and precautions that will be observed related to selective withdrawal crane rehabilitation that will occur over the winter, necessitating a more conservative gate removal pattern. Rather than removing all gates (resulting in withdrawal elevation of 2,222 ft.), the Corps removed all but 3 rows of gates (resulting in withdrawal elevation of 2,253 ft.).

### ***2.7. Lake Pend Oreille Kokanee Spawning Flows (Albeni Falls Dam)***

This section will be updated pending an SOR for this operation that could occur in September of 2014.

## 2.8. Upper Snake Flow Augmentation

This section will be updated throughout the season as new information becomes available.

## 2.9. Chum Operation

Date	TMT Discussion/Chum Operation
October 30, 2013	TMT Meeting - WDFW reported that five Chum have passed Bonneville and Chum are expected to arrive in the Ives area this weekend with the forecasted rain. The Action Agencies will plan to implement Chum operations on November 7th, pending the TMT check-in scheduled for November 6th. The operation will target a tailwater elevation of 11.5ft with a band of 11.3 to 11.7ft. The Corps reported that due to construction efficiencies, the lamprey flume work is ahead of schedule and is not expected to conflict with the Chum operation. CRITFC assured the TMT that CRITFC enforcement will monitor Hamilton Springs for gill net use in the area.
November 6, 2013	TMT Meeting - WDFW reported that Chum have passed Bonneville and were noted in the Ives, Horseshoe, Multnomah, Hamilton Creek, and Hamilton Springs areas. The TMT coordinated the start of the Bonneville Dam Chum operation for 0600 hours on November 7 <sup>th</sup> .
November 20, 2013	TMT Meeting - WDFW reported that flow conditions have not been favorable for surveying Chum, however, the run is underway and at this point, it appears that numbers are average to below average. Survey data for this week (11/19) was not yet available. There are 112 Chum reported to have passed Bonneville as of 11/19 and recent BPA observations indicate approximately 25 pairs were spawning in the Hamilton Springs and Hamilton Creek area. The Corps reported that the Bonneville tailwater operation is underway, targeting 11.5ft, with a range of 11.3-11.7ft. Currently, the Bonneville tailwater elevation is at 11.6ft.

Chum survey data gathered at the Ives/Pierce Island Complex are summarized in the table below. Data from all Chum survey areas, including the Ives/Pierce Island Complex, are provided by the Fish Passage Center and available on the following website:

[http://www.fpc.org/spawning/spawning\\_surveys/ODFW\\_reports/2013spawning.htm](http://www.fpc.org/spawning/spawning_surveys/ODFW_reports/2013spawning.htm)

**Table 9. Chum Data from Surveys of the Ives/Pierce Island Complex**

Date	Lives	Dead <sup>i</sup>	Redds <sup>ii</sup>	Visibility (ft)
24-Sep	0	0	0	12.5
3-Oct	0	0	0	5
8-Oct	0	0	0	5
10-Oct	0	0	0	10
15-Oct	0	0	0	10
17-Oct	0	0	0	10
22-Oct	0	0	0	6
24-Oct	0	0	0	6
29-Oct	0	0	0	12
31-Oct	2	0	0	11

Date	Lives	Dead <sup>i</sup>	Redds <sup>ii</sup>	Visibility (ft)
5-Nov	7	0	0	8
12-Nov	13	0	2	10
19-Nov	27	0	4	7

i. Dead are newly sampled fish only.

ii. Redds are an instantaneous count for the day, not cumulative.

### ***2.10. Vernita Bar/Hanford Reach Fall Chinook Protection Program Operations (Non-BiOp Action)***

Date	Summary
November 24, 2013	<ul style="list-style-type: none"> <li>On November 24, 2013, the third Vernita Bar ground redd count was conducted to determine the 2013-2014 Hanford Reach Critical Flow Elevation.</li> <li>Based on the survey count and the Hanford Reach Fall Chinook Protection Program Agreement, the 2013-2014 Critical Flow Elevation was set at the 65 kcfs elevation.</li> <li>The Monitoring Team agreed that the fish spawning season had ended and that November 24, 2013 be identified as the end of spawning date.</li> </ul>

### ***2.11. Snake River Zero Generation (Non-BiOp Action)***

According to the Lower Snake projects' operating manuals, from December 1 through February 28, "zero" minimum project discharge is permitted on a limited basis. Under an agreement between the Corps of Engineers and the fishery agencies, zero river flow is allowed for water storage during low power demand periods (at night and on weekends) when there are few, if any, actively migrating anadromous fish present in the Snake River. Water stored under zero river flow conditions may maximize power production from the Columbia River Basin system, but zero river flow operations are not recommended at Lower Snake projects when fish are actively migrating in the Snake River."

Salmon Managers submitted System Operations Request (SOR) 2005-22 Snake River Zero Nighttime and Weekend Flow, to the Action Agencies (AA) on December 6, 2005. The SOR may be found on the following website:

<http://www.nwd-wc.usace.army.mil/tmt/sor/2005/2005-22.pdf>

In the SOR the Salmon Managers provided the AAs with the following table to clarify the criteria of "... few, if any ..." prior to the implementation of the Zero Generation Operation.

The few migrating adult criterion trigger will be defined on a sliding scale outlined in the following table. The table applies to both “wild” and “total” categories of returning adult steelhead.

Run to date>#	Run to date< #	Few criteria< #
0	30,000	10
30,000	60,000	20
60,000	100,000	35
100,000	150,000	50
150,000	200,000	65
200,000	250,000	80
250,000		100

The AAs will implement the Snake River Zero Nighttime Generation Operation on the Lower Snake River during winter of 2013/2014 in coordination with the TMT.

### 2.12. Minimum Operating Pool (MOP)

Surveys conducted in 2011 demonstrated impairment of the federal navigation channel in the Lower Granite pool. In accordance with the RPA, until maintenance activities are conducted to provide adequate channel depths for safe navigation, the Corps supports adopting the variable minimum operation pool (MOP) operation used during the 2013 season (Table 9) and coordinated this operation with TMT in 2011/2012/2013. Snake River MOP ranges (Table 10) as well as the variable MOP operation inflow dependent ranges are included below.

**Table 9. Variable MOP Ranges for Lower Granite Dam**

Lower Granite Inflows	Operation	Minimum Operating Pool Elevation (ft)	Upper Limit of 1-foot Operating Range (ft)
≥ 120 kcfs	MOP	733.0	734.0
80 kcfs - 119 kcfs	MOP +1	734.0	735.0
50 kcfs - 79 kcfs	MOP +1.5	734.5	735.5
≤ 49 kcfs	MOP +2	735.0	736.0

**Table 10. MOP Elevation Ranges for Lower Snake River Projects**

Project	Minimum Operating Pool Elevation (ft)	Upper Limit of 1-foot Operating Range (ft)
Ice Harbor	437.0	438.0
Lower Monumental	537.0	538.0
Little Goose	633.0	634.0
Lower Granite*	733.0	734.0

\*See table above for LWG variable MOP operation

At John Day Dam from April 10 to September 30, the forebay is operated within a 1.5 ft range of the minimum elevation that provides irrigation pumping. The initial range is 262.5 to 264.0 feet. The minimum elevation will be adjusted upward as necessary to facilitate irrigation pumping.

### ***2.13. Spill and Transportation in 2014***

This section will be updated once the 2014 Fish Operations Plan is available by April of 2014.

### ***2.14. Fish Passage Research in 2014***

This section will be updated once the Fish Passage Plan is complete in April 2014.