2013 Water Management Plan
Seasonal Update
November 1, 2012

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 1st of each year. The first update for the primary elements of Spring and Summer will be posted by March 1st 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	October 24, 2012
	Seasonal Flow Objectives	April	August	June 1, 2012
	Flood Control	January	June	June 1, 2012
	Storage Project Operations	September	September	October 24, 2012
	Water Quality (Spill Priority Lists)	April	August 31	October 24, 2012
	Specific Operations	**Start Date**	**End Date**	**Last Updated**
	Chum Flows (Bonneville Dam)	November 1	May 8	June 1, 2012
	Spring Creek Hatchery Releases (Bonneville Dam)	April 11	May 3	May 15, 2012
	Burbot Flows (Libby Dam)	November	December 30	November 1, 2010
	Upper Snake Flow Augmentation	April	August 31	June 8, 2012
	Lake Pend Oreille Kokanee (Albeni Falls Dam)	September	December 30	October 24, 2012
	Transportation	May 1	September 30	October 24, 2012
	Spill Operations	April 3	August 31	October 24,, 2012
	Fish Passage Research	March	April 3	June 8, 2012
	Snake River Zero Generation	December	February	February 14, 2012
	Hanford Reach Fall Chinook Protection	November	June	May 2, 2012

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 4th business day of the month (except June and July, which are taken on June 4 and July 3, 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 2013		April-August 2013	
	Volume (maf)	% of 30-year Average (107.3 maf)	Volume (maf)	% of 30-year Average (93.1 maf)
January 6				
February 6				
March 6				
April 5				
May 4				
June 4				
July 3				

Table 3. Grand Coulee Dam Final Water Supply Forecasts.

Forecast Issue Date	January-July 2013		April-August 2013	
	Volume (maf)	% of 30-year Average (62.9 maf)	Volume (maf)	% of 30-year Average (60.3 maf)
January 6				
February 6				
March 6				
April 5				
May 4				
June 4				
July 3				

Table 4. Lower Granite Dam Final Water Supply Forecasts.

Forecast Issue Date	January-July 2013		April-August 2013	
	Volume (maf)	% of 30-year Average (30.0 maf)	Volume (maf)	% of 30-year Average (22.9 maf)
January 6				
February 6				
March 6				
April 5				
May 4				
June 4				
July 3				

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 2013	
	Volume (kaf)	% of 70-year Average (6,337 kaf)
November 7, 2011 (pre-season)		
December 7, 2011		
January 6, 2012		
February 6, 2012		
March 6, 2012		
April 5, 2012		
May 4, 2012		
June 4, 2012		

Table 6. Dworshak Dam Final Water Supply Forecasts.

Forecast Issue Date	April-July 2013	
	Volume (kaf)	% of 70-year Average (2,683 kaf)
December 8, 2011		
January 10, 2012		
February 7, 2012		
March 6, 2012		
April 5, 2012 (Non-Shifted)		
May 4, 2012		
June 4, 2012		

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 2013		January-July 2013		May-September 2013	
	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 9						
February 7						
March 6						
April 4						
May 3						
June 6						

Weekly Weather and Precipitation Retrospectives

Week	Weekly Weather / Precipitation Retrospective
October 8, 2012	**Temperatures:** Fell to near average. **Rainfall:** Below average for the 13th week in a row. Scattered moderate rain in BC. First light snows of the season in BC on Tuesday and western MT on Wednesday. **Streamflows:** Brief spikes in BC, otherwise flat and below average for early October.
October 15, 2012	**Temperatures:** Slightly above average. Above average snow levels. **Rainfall:** Well below average through Thursday, then well above average with the first widespread rains of the season. **Streamflows:** Flat flows initially, but basinwide, minor rises have begun due to the weekend rain.
October 22, 2012	**Temperatures:** Slightly above average, then fell below average. **Rainfall:** Well above average northern 2/3rd of the basin, especially in BC. Below average southern 1/3rd. **Streamflows:** Slight increase in flows basinwide, but most noticeably in Canada. Significant improvement in soil moisture content noted.
October 29, 2012	**Temperatures:** Below average. **Rainfall:** Above average basinwide. First significant mountain snows of the season early last week. **Streamflows:** Slightly increased flows basinwide, except west of the Cascades where more substantial increases were noted this weekend. Much of the initial rains soaked into soils rather than run off into streams.
November 5, 2012	
November 12, 2012	
November 19, 2012	
November 26, 2012	
December 3, 2012	
December 10, 2012	
December 17, 2012	
December 24, 2012	
December 31, 2012	
January 7, 2013	
January 14, 2013	
January 21, 2013	
January 28, 2013	
February 4, 2013	
February 18, 2013	
February 11, 2013	
February 25, 2013	
March 4, 2013	
March 11, 2013	
March 18, 2013	
March 25, 2013	
April 1, 2013	
April 8, 2013	
April 15, 2013	
April 22, 2013	
April 29, 2013	
May 6, 2013	
May 13, 2013	
May 20, 2013	
May 27, 2013	

June 3, 2013
June 10, 2013
June 17, 2013
June 24, 2013
July 1, 2013
July 8, 2013
July 15, 2013
July 22, 2013
July 29, 2013
August 5, 2013
August 12, 2013
August 19, 2013
August 26, 2013

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[i]	
	Summer 7/1–8/31	200 kcfs	
Lower Granite	Spring 4/3–6/20	85-100 kcfs[i]	
	Summer 6/21–8/31	50-55 kcfs[ii]	

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.

Project	Elevation Date Objective	Dec	Jan	Feb	Mar	Apr
Libby	**Jan 31**					
	Feb 28					
	March 31					
	April 10					
	April 15					
	April 30					

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

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 presented in Table 7 of the WMP.

April 10 and Refill Objectives: Discussion of Libby April 10 elevation objective will be included pending completion of the Corps February Runoff Forecast the most probable runoff volume for April – August. This section will be updated throughout the season as new forecast information becomes available.

Summer Draft Limit: On March 28, 2012, the AAs received SOR 2012-01 from the Kootenai Tribe of Idaho to provide Libby target outflows of 6,000 cfs in the month of September and 4,000 cfs in the month of October. The objective of implementing the request was to provide decreased Libby outflows during the months of September and October in order to facilitate sturgeon habitat restoration actions being implemented by the Tribe in the Kootenai River. Based on information provided in the SOR it is likely the Kootenai Tribe will request a similar type of operation in 2013.

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 Final WSF for April–August was 1962 kaf (95 % of average). Minimum flow requirements from Hungry Horse and Columbia Falls are currently set 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 2013 Final forecast.

April 10 and June 30 Refill Objectives: The Bureau of Reclamation computes Hungry Horse's final April 10 elevation objective by linear interpolation between the March 31 and April 15 forecasted flood control elevations based on the March Final WSF. Hungry Horse Reservoir is expected to refill by approximately June 30. A late snowmelt runoff may delay refill to sometime after June 30 in order to avoid excessive spill at the project.

Summer Draft Limit: The experimental 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: The Bureau of Reclamation computes Grand Coulee's final April 10 elevation objective by linear interpolation between the March 31 and April 15 forecasted flood control elevations based on the March Final WSF for The Dalles.

Grand Coulee will operate to refill around June 30 to provide summer flow augmentation. In order to demonstrate that water was released from Grand Coulee during the spring under the Lake Roosevelt Incremental Storage Release Program, Grand Coulee will target a refill elevation following a recommendation from the Fish Flow Releases Advisory Group (FFRAG).

The Lake Roosevelt Incremental Storage Release Program

The amount and timing of water to be released in 2013 will not be determined until the March final WSF for April – September at The Dalles is completed. Estimates of 2013 incremental storage releases will be included in the 2013 seasonal update some time during the spring.

Summer Draft Limit: The Grand Coulee summer draft limit is set by the magnitude of the RFC's July Final April–August WSF at The Dalles Dam.

Drum Gate Maintenance: Drum gate maintenance is planned to occur during April and May annually. Maintenance was performed in 2012 and will be performed in 2013 if conditions allow.

Banks Lake: Banks Lake will draft to elevation 1565 ft. byAugust 31 to provide more water for summer flow augmentation. Pumping to Banks Lake will be reduced and irrigation for the Columbia Basin Project will be met be drafting the reservoir up to 5 ft. from full (elevation 1565 ft.) by August 31

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**: Wintertime spill priority list coordinated during the August 29, 2012, TMT meeting that may be found on the following website: http://www.nwd-wc.usace.army.mil/tmt/agendas/2012/0829_Agenda.html

2.6. Spring Creek Hatchery Releases (Bonneville Dam)

The AAs will coordinate with the TMT on this operation during the Spring of 2013.

2.7. 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.).

2.8. Lake Pend Oreille Kokanee Spawning Flows (Albeni Falls Dam)

IDFG presented SOR USFWS/IDFG2012-1 during the September 19, 2012, TMT meeting that included the following specifications.

IDFG and USFWS request that the Corps draw Lake Pend Oreille down to a winter minimum control elevation (MCE) no lower than 2055' during the winter of 2012-2013. Conduct drawdowns while minimizing or eliminating the need to spill at Albeni Falls Dam. We request that the drawdown be completed by November 8 if reasonably possible. During the past five years, kokanee spawning has commenced around November 8 (earlier than years prior). If this is not possible, the MCE should be reached as soon as possible after November 8 and no later than November 15, and should not be dropped below this elevation for the duration of the winter. IDFG will monitor arrival time of kokanee at shoreline spawning areas and provide timely reports to the federal agencies. These proposed operations are not anticipated to cause exceedance of the state maximum total dissolved gas standards at downstream projects barring unforeseen circumstances. Lake Pend Oreille will then be held within 0.5' above the MCE to the end of kokanee spawning (monitored by IDFG) or December 31, whichever comes first. During the September 19 TMT meeting the AAs committed to implement the SOR as requested.

2.9. Upper Snake Flow Augmentation

Preliminary estimates of Upper Snake River flow augmentation will be updated in April 2013

2.10. Chum Spawning and Incubation Flows (Bonneville Dam)

Date	TMT Discussion/Chum Operation
October 17, 2012	TMT discussion – 0 chum observed to date. AAs will plan to begin chum ops (11.3-11.7ft.) with a target of 11.5 ft. on November 8, 2012.

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/2012spawning.htm

Table 8. Chum Data from Surveys of the Ives/Pierce Island Complex

Date	Lives	Dead[i]	Redds[ii]	Visibility (ft)
18-Sep	0	0	0	12 ft.
26-Sep	0	0	0	12 ft.
3-Oct	0	0	0	10 ft.

Date	Lives	Dead[i]	Redds[ii]	Visibility (ft)
8-Oct	0	0	0	12 ft.
12-Oct	0	0	0	12 ft.
15-Oct	0	0	0	12 ft.
19-Oct	0	0	0	1 ft.
22-Oct	5	0	0	8 ft.
24-Oct	6	0	1	10 ft.

i. Dead are newly samply fish only.
ii. Redds are an instantaneous count for the day, not cumulative.

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

Date	Summary
October21, 2012	• On Sunday, October 21, 2012, the first Vernita Bar ground redd count was conducted to determine the Initiation of Spawning for the zones below and above the 50 kcfs elevation. The Monitoring Team consisted of Paul Hoffarth (WDFW) and Chris Carlson (GCPUD). Observing the redd count was Jeff Fryer (CRITFC). Flows from Priest Rapids Dam at Vernita Bar were about 37 kcfs. Based on the above survey count and the Hanford Reach Fall Chinook Protection Program Agreement, the Initiation of Spawning has not occurred for either zone below or above the 50 kcfs elevation. • The next redd count will occur on October 28, 2012 and will require USGS gauging station flows of 38 kcfs.

2.12. Snake River Zero Generation (Non-BiOp Action)

According to the Lower Snake projects' operating manuals, from December through February, "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."

In 2005, the Salmon Managers developed guidance criteria (3-day running average of less than 65 total run (hatchery and wild) adult steelhead and less than 20 wild adult steelhead passing Lower Granite per day) for dropping to zero generation. The status of the actively migrating fish in the Snake River will be evaluated in November and December to determine when the criteria have been met.

The AAs will coordinate with the TMT on Snake River zero generation operation.

2.13. 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 2011/ 2012 season (Table 9) and coordinated this operation with TMT in 2011/2012. 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.

2.14. Spill and Transportation in 2013

This information will be posted as soon as it becomes available.

2.15. Fish Passage Research in 2013

This information will be posted as soon as it becomes available.