

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday January 12, 2010 9:00am - 12:00pm

NOAA Fisheries
1201 NE Lloyd Blvd, Suite 1100, Columbia Room
Portland, OR 97232

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274
Access Code 3871669

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnv.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review December 8 and 22 Meeting Minutes [\[Meeting Minutes\]](#)
3. Update on Water Supply Forecasts - Steve Barton, COE-RCC
 - a. [RFC Snow](#)
 - b. [Westwide SNOTEL](#)
4. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality
5. Other
 - a. Set agenda and date for next meeting - **January 26, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

January 12, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator//Notes: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Review of Meeting Minutes for December 8 Year End Review and December 22 Conference Call

The 12/8 Year End Review summaries will be posted and finalized at the next TMT meeting. With no additional changes to the 12/22 Conference Call notes, they were considered final.

Water Supply Forecasts

Steve Barton, COE, shared information from the COE's official and the RFC January final forecasts. He noted percentages for various parts of the basin, with a general conclusion that at this early point in the season, the outlook is 'near normal' with most of the above normal precipitation on the U.S. side balanced by some below normal precipitation in Canada. In response to a question, Steve generalized that the Columbia Basin as a whole sits about 60% in Canada and 40% in the U.S. He also shared links to the snow pack sites and again, noted that snow pack was ranging normal to above normal most everywhere, except North Central Idaho, North Central Cascades and parts of Canada.

Steve acknowledged the difference between the COE's official Libby forecast (5,610 kaf, down from the December prediction) and the RFC January final forecast (5,820 kaf) and suggested that the COE will continue to monitor and coordinate on changing conditions with its regional partners. That said, the official COE forecast as of today showed Libby at about 98.6% of normal. The Dworshak April-July forecast was 124% of normal; Grand Coulee was 94% of normal; The Dalles was 97% or normal; Lower Granite was 110% of normal and Hungry Horse was 106% of normal.

Operations Review

Reservoirs: John Roache, Reclamation, reported that Grand Coulee was at elevation 1281.85 feet and using flexibility to implement a slow draft to its spring target elevation. Hungry Horse was at elevation 3537.28 feet, with 5.5 kcfs outflows that will ramp down later this week. He acknowledged some fluctuations at the project to meet load needs, and suggested the project had flexibility to do so, given the storage and water supply forecasts. He also noted that the project discharge capacity is 9 kcfs given limited transmission, and will target 3519 feet by 4/30 (as of today's forecasts, which will likely change). Steve Barton, COE, reported that Libby was at elevation 2410.41 feet with 3.3 kcfs in and 4.0 kcfs out. The current end of January target elevation is 2424.5 feet. Albeni

Falls was at elevation 2055.6 feet, with 19.5 kcfs in and 20.4 kcfs out. Dworshak was at elevation 1527.43 feet, with 1.3 kcfs in and 4.0 kcfs out. Flows at Lower Granite were 30.2 kcfs; 130.9 kcfs at Priest Rapids; 147.3 kcfs at McNary and 177.6 kcfs at Bonneville – all were higher than their prior week averages.

Fish: Paul Wagner, NOAA, recapped chum spawning and noted that chum operations are now in incubation mode at a minimum elevation of 12.2 feet. The daily count peak for lives was 134 and for redds was 39. Numbers were higher at Ives Island than in recent past years, but not significantly so; areas around Multnomah Falls and the I-205 bridge, however, showed significant increases in counts. Paul noted he is still gathering information from WDFW and Batelle to verify the exact elevation of spawning and will share that data ASAP. It was agreed that this information will likely not impact operations, given the higher flows in the system.

Power: Nothing to report.

Water quality: Nothing to report.

Next TMT Meeting, February 9, 9:00 am:

Agenda items will include:

- Updated Weather and Water Supply Forecasts
- Pinnipeds Report
- Operations Review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

January 12, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Robin Gumpert (DS Consulting). Representatives of USFWS, BPA, BOR, NOAA, Washington, Idaho, CRITFC and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Anyone with questions or comments about this summary should give them to the TMT chair or bring them to the next meeting.

2. Meeting Minutes for December 8 and 22, 2010

Notes and minutes for the TMT year-end review on December 8 are still being reviewed and have not yet been posted, Doug Baus (COE) reported. These will be reviewed at the next TMT meeting on February 9, 2011. There were no comments today on the December 22 official minutes or facilitator's notes, so these are considered final.

3. Update on Water Supply Forecasts

Barton gave TMT the first glimpses of the 2011 water year to date, or from October 1, 2010, through January 10, 2011, including precipitation, snow, and water supply forecasts.

Precipitation. The year so far has been wetter than previous years with the exception of the Canadian portion of the Columbia basin.

- Columbia River basin above Castlegar, B.C. – 70% of normal.
- Columbia basin above Grand Coulee Dam – 94% of normal.
- Snake River basin above Ice Harbor Dam – 120% of normal.
- Columbia basin above The Dalles Dam – 101% of normal.
- Kootenai basin – 85% of normal (the Canadian portion is quite dry).
- Clearwater basin – 101% of normal.

The U.S. portion of the Columbia basin overall has had normal to above normal precipitation to date in water year 2011. However, the Canadian portion of the Columbia and Kootenai basins and the east side of the Cascade range in Washington state are all drier than normal.

Snowpack. Two links to today's agenda provide snowpack data. Item 3a is the RFC snow pillows site, which shows the Canadian portions of the basin as having below normal snowpack. Item 3b is the west side SNOTEL data. Barton reported that snowpack is normal to above normal in Oregon, southern Idaho

and western Montana; slightly below normal in north central Idaho and the northern Cascade Mountains; and below normal in the Canadian reaches.

Water supply forecasts. For Libby Dam, the COE's April-August forecast is 5,610 kaf, down from the 6,262 kaf forecasted for December. The decrease is attributed to lack of snow accumulation in Canada. The current RFC forecast is 5,820 kaf, only slightly higher than the COE forecast. RFC forecasts are consistently higher than COE forecasts, but 2011 to date is shaping up differently. The Action Agencies are in constant coordination to refine forecasts.

Regarding the forecasting methodology for Libby Dam operations, Barton explained that several items in the JTS memo issued in September 2010 were factually incorrect. He invited TMT members to call him with any concerns about Libby forecasting, then presented the current water supply forecasting data for dams throughout the Columbia basin:

- COE Libby water supply forecast – 96% of normal (5.61 maf).
- COE Dworshak water supply forecast for April-July, 2011 – 124% of average (3.34 maf).
- RFC final Grand Coulee forecast (issued January 7, 2011) – 94% of normal (59 maf for January-July, and 60 maf for April-September).
- RFC forecast for The Dalles – 97% of normal (104 maf for January-July, and 90.6 maf for April-August).
- RFC forecast for Libby – 5,820 kaf (slightly higher than the COE forecast of 5,610 kaf).
- RFC forecast for Lower Granite – 110% of normal (23.7 maf for April-July).
- BOR forecast for Hungry Horse – 106% of normal (2,356 kaf), which is close to the RFC volume forecast of 2,360 kaf.

Dave Wills (USFWS) asked how much of the Columbia basin lies in Canada; Barton estimated a little more than half. It's a difficult basin to predict from a modeling standpoint. Nevertheless, all the COE forecasts are within a few hundred kaf of the RFC forecasts for the same areas, which implies that the COE forecasting methodology is tracking appropriately.

4. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,281.85 feet, discharging to meet the minimum tailwater elevation requirement of 12.2 feet for chum incubation below Bonneville. Lake Roosevelt will be drafted down in March-April 2011 for required drum gate maintenance.

Hungry Horse is at elevation 3,537.28 feet with discharges of 5.5 kcfs in response to load. Storms in the area are expected over the next 10 days and snowpack is getting deep. In addition, the powerhouse is limited to 9 kcfs releases due to transmission restrictions instead of the typical capacity of 12 kcfs. The April 30 flood control target at Horse is currently 3,519 feet. Thus the

reservoir elevation is currently 20 feet above flood control. Horse will ramp down the 5.5 kcfs releases beginning on January 14.

Libby is at elevation 2,410.41 feet, with inflows of 3.3 kcfs and minimum discharges of 4.0 kcfs. Albeni Falls is at elevation 2,055.6 feet, with inflows of 19.5 kcfs and discharges of 20.4 kcfs. Dworshak is at elevation 1,527.43 feet, with inflows of 1.3 kcfs and discharges of 4.0 kcfs.

Lower Granite is discharging 30.2 kcfs; last week's average was 27.4 kcfs. Priest Rapids is discharging 130.9 kcfs; last week's average was 108 kcfs. McNary is discharging 147.3 kcfs; last week's average was 136 kcfs Bonneville is discharging 177.6 kcfs; last week's average was 151 kcfs.

b. Fish. Chum spawning below Bonneville Dam peaked on November 23, 2010, with 39 redds observed. Live adult chum counts peaked at 134 fish observed in the Ives Island area. This number is a little higher than in previous years but nothing stellar, Paul Wagner reported. The peak count this year was 252 chum spawners at Woods Landing, a recently identified area near I-205. This number is also higher than in previous years but no blockbuster. The largest count on record was in 2002, with 2,000 live chum observed in the Ives area.

When spawning was declared complete at the last TMT meeting on December 22, 2010, the chum operation switched to the incubation phase, maintaining a 12.2-foot minimum elevation in the Bonneville tailwater. A subsequent survey on December 28 found no new fish in the area. Wagner reported that he is working on identifying the actual peak elevation at which spawning occurred so the lowest possible protective elevation can be identified. That evaluation is not yet completed, so for the time being the minimum elevation remains at 12.2 feet. At present, there is no pressure to complete the evaluation because flows have been well above 12.2 feet.

c. Power System. There was nothing to report today.

d. Water Quality. There was nothing to report today.

3. Next Meetings

The next TMT meeting in person will be in a month on February 9, 2011. The typical TMT winter schedule is to meet in person every 2 weeks or on January 26, but a PIT tag workshop that day means several TMT members will be unavailable. Conference calls will be arranged if needed in the interim.

Name	Affiliation
David Wills	USFWS
Scott Bettin	BPA
John Roache	BOR
Paul Wagner	NOAA
Doug Baus	COE

Tim Heizenrader

Centaurus

Phone:

Tony Norris

BPA

Steve Barton

COE

Cindy LeFleur

Washington

Mike Shapley

Snohomish PUD

Laura Hamilton

COE

Steve Hall

COE

Dave Benner

FPC

Ruth Burris

PGE

Russ George

WMC

Shane Scott

PPC

Barry Espenson

CBB

Rob Allerman

Deutsch Bank

Tom Le

Puget Sound Energy

Russ Kiefer

Idaho

Tom Lorz

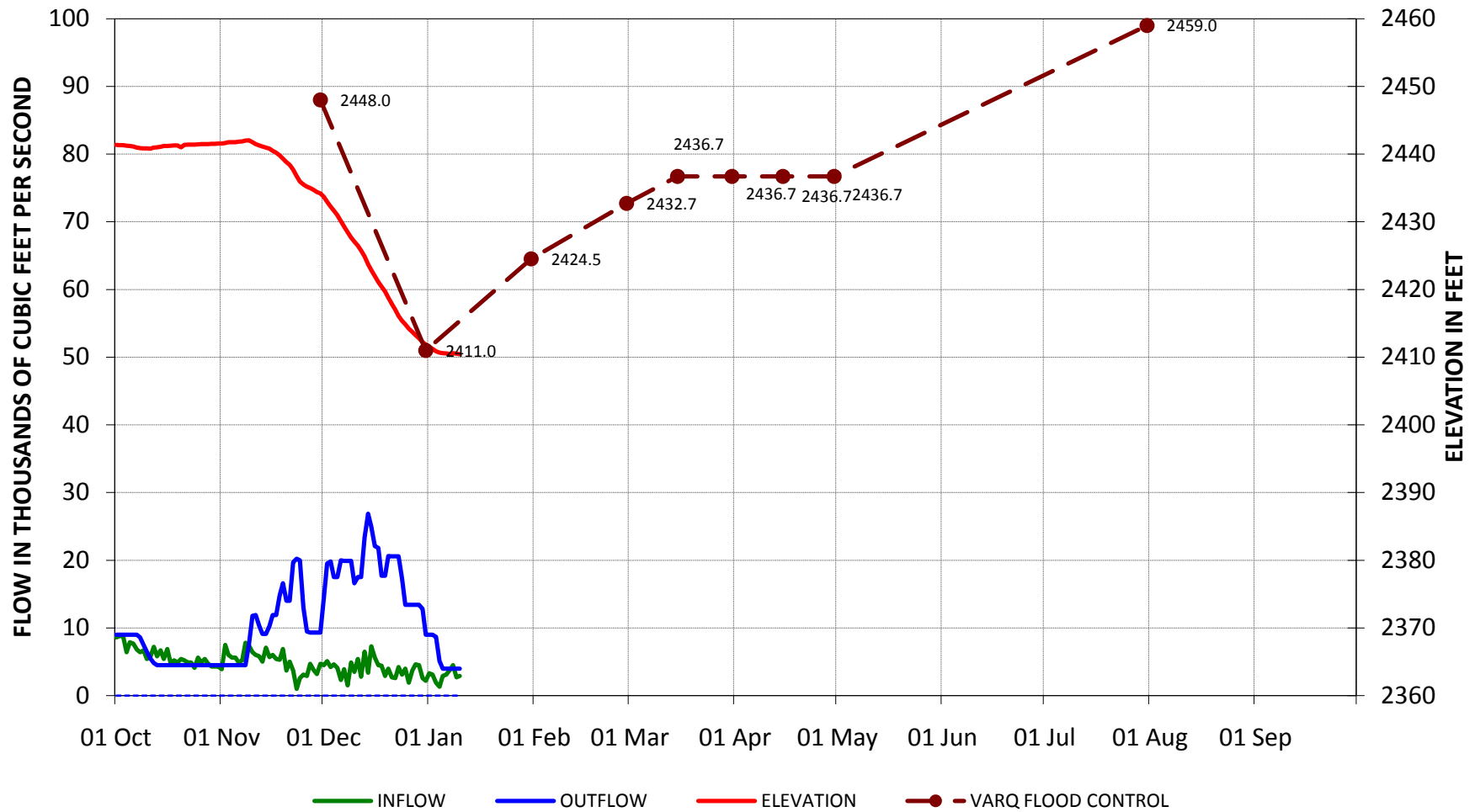
CRITFC

Scott English

COE

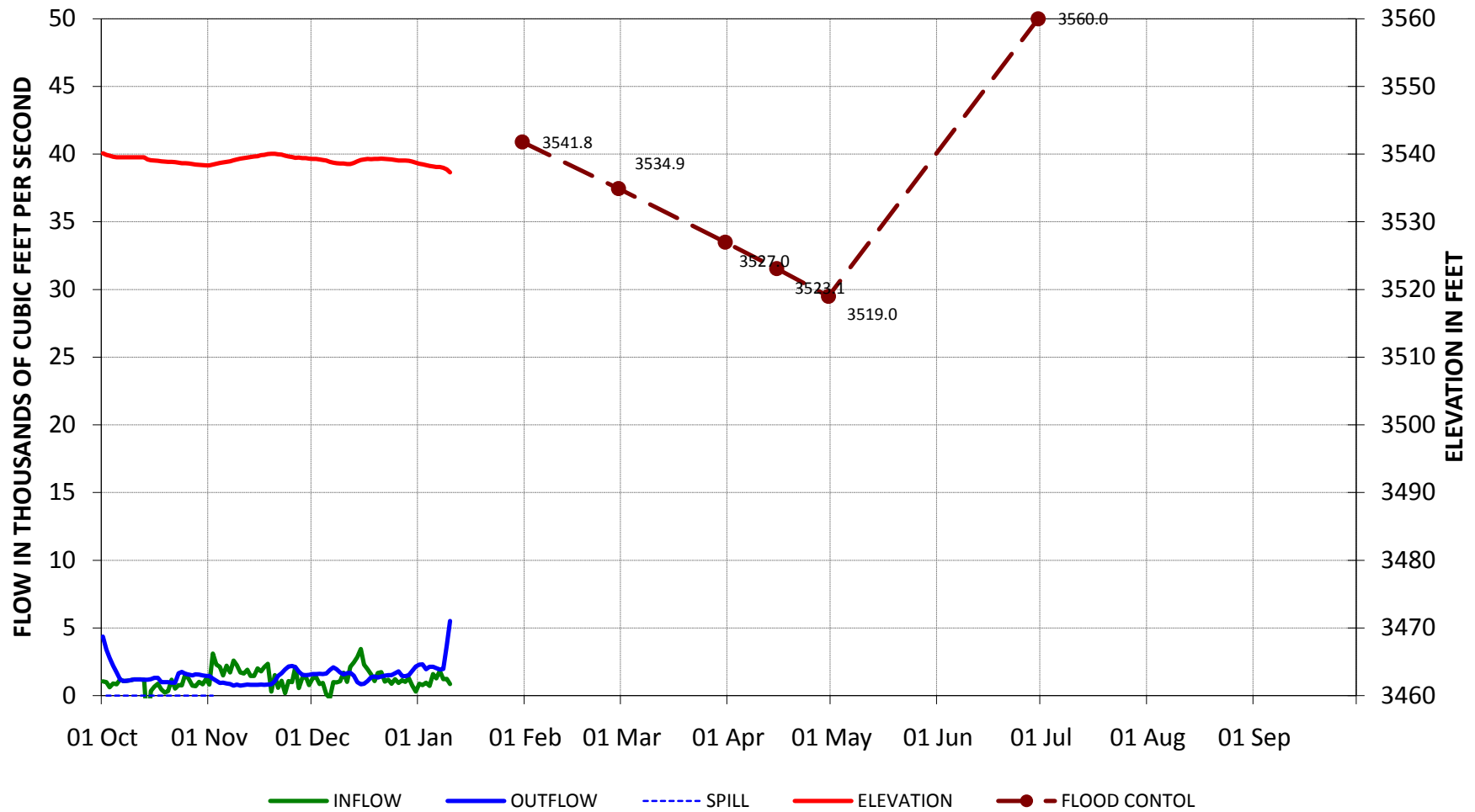
LIBBY DAM AND RESERVOIR

Water Year 2011



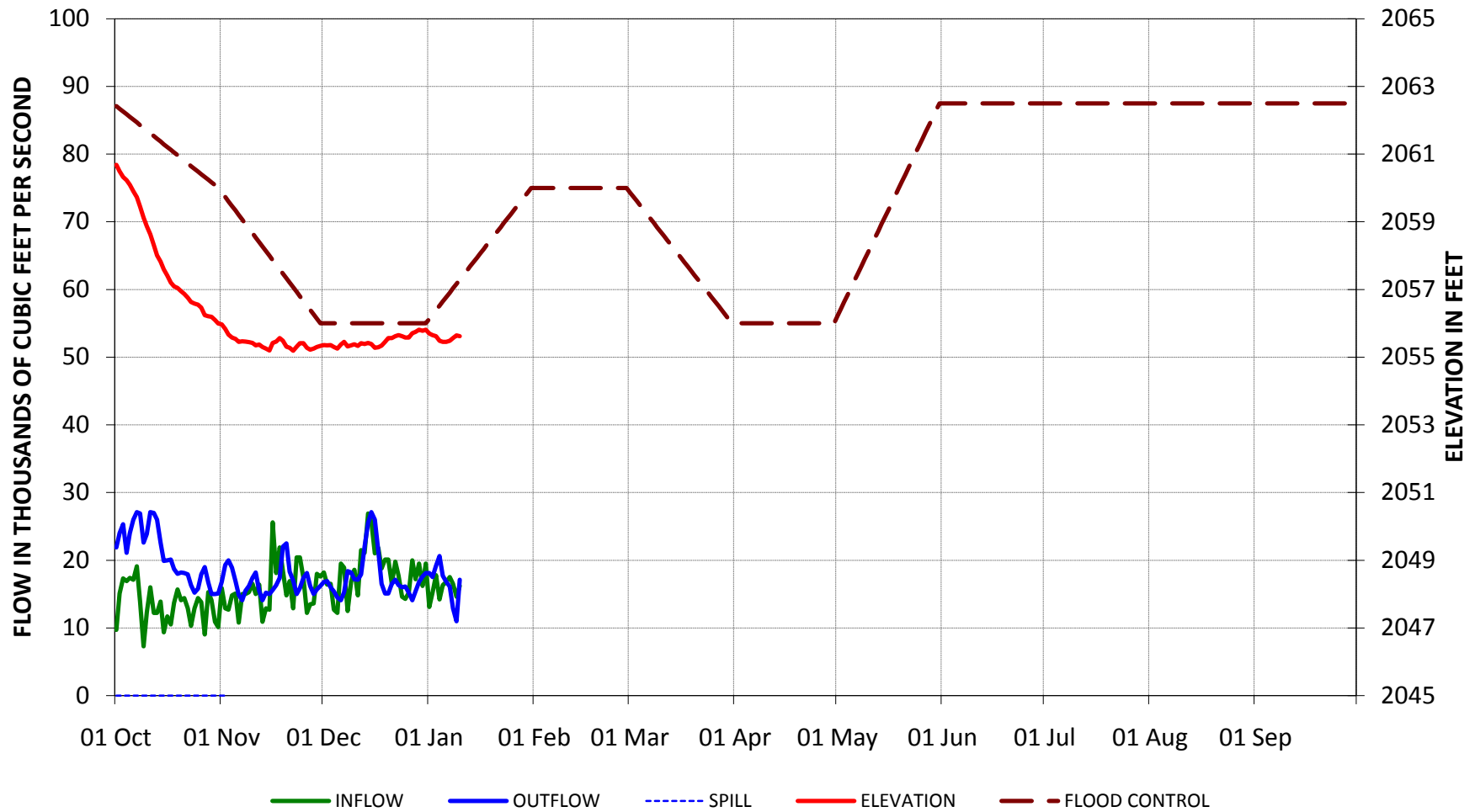
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



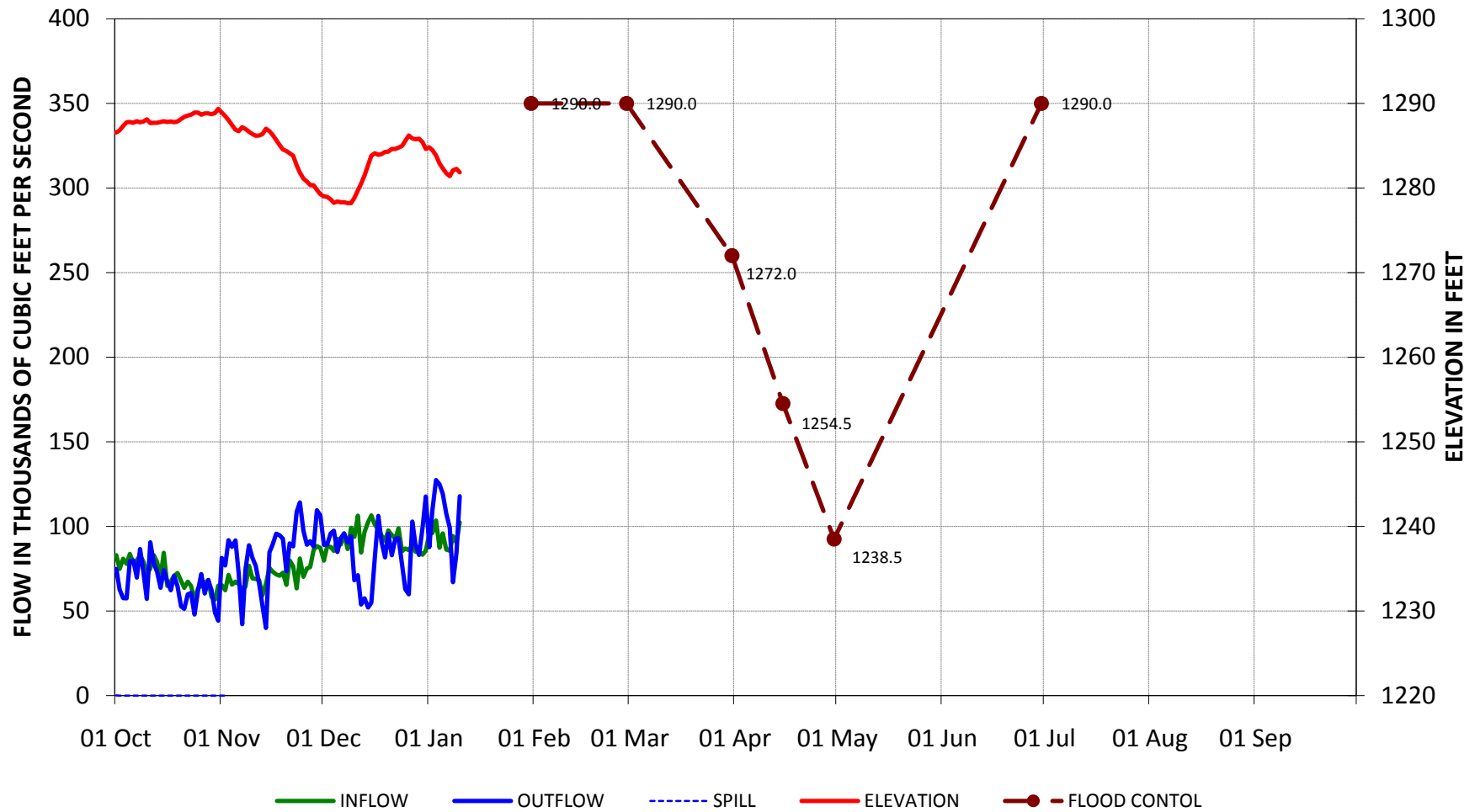
ALBENI FALLS DAM AND RESERVOIR

Water Year 2011



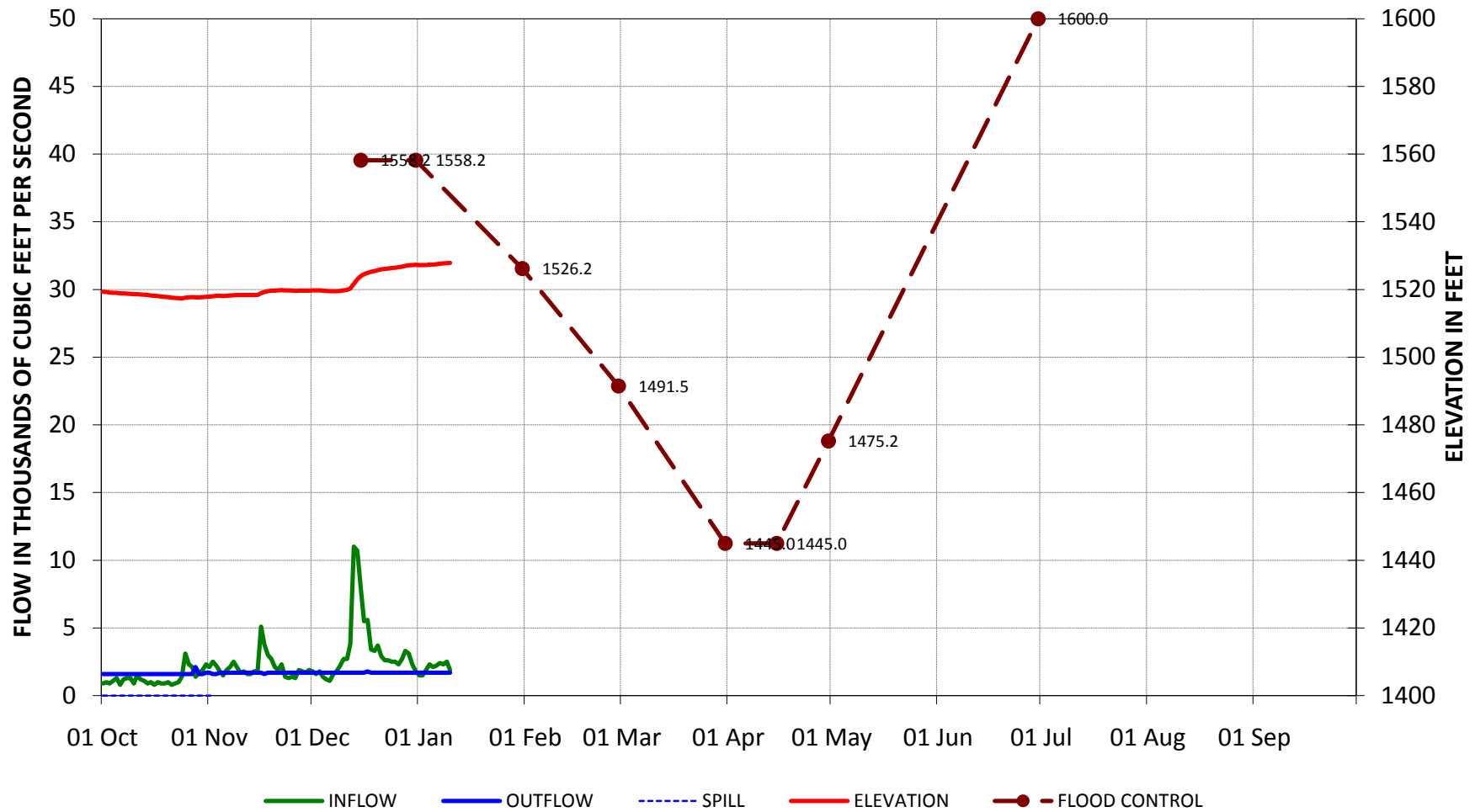
GRAND COULEE DAM AND RESERVOIR

Water Year 2011



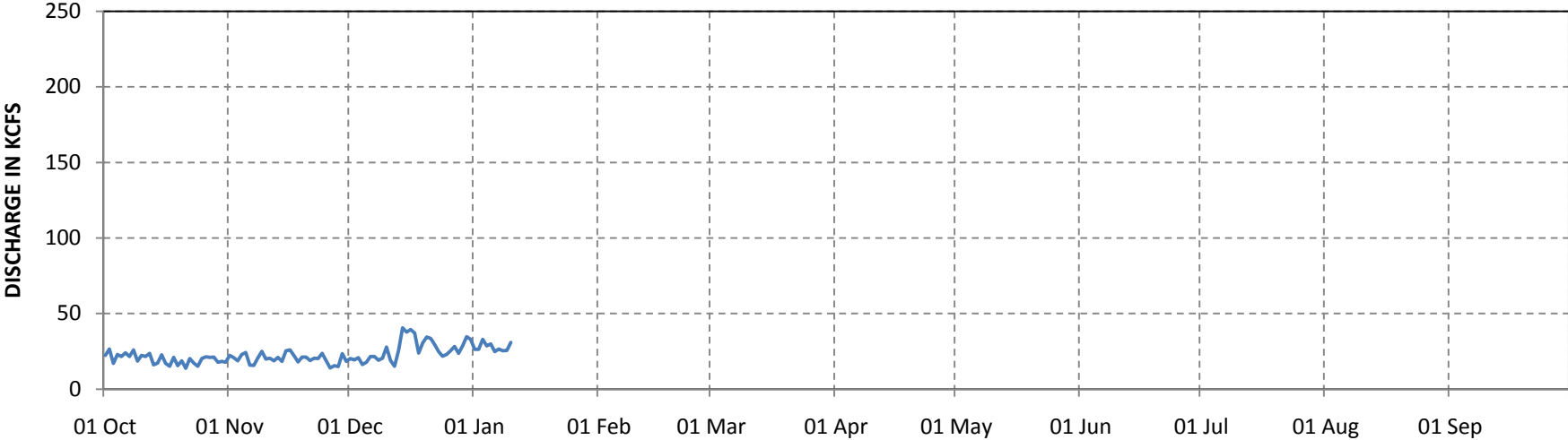
DWORSHAK DAM AND RESERVOIR

Water Year 2011

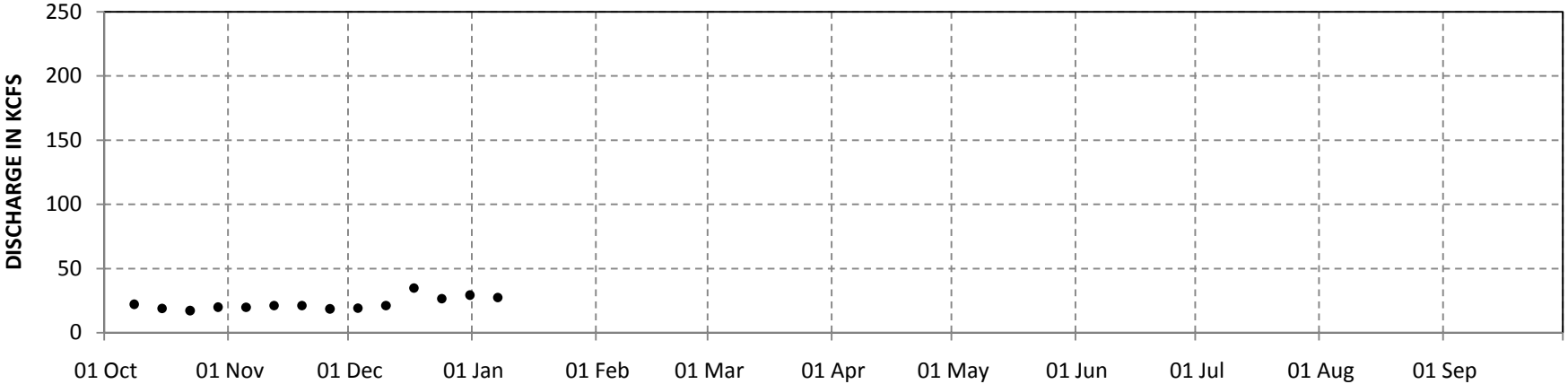


PROJECT DISCHARGE SUMMARY

SNAKE RIVER AT LOWER GRANITE DAM

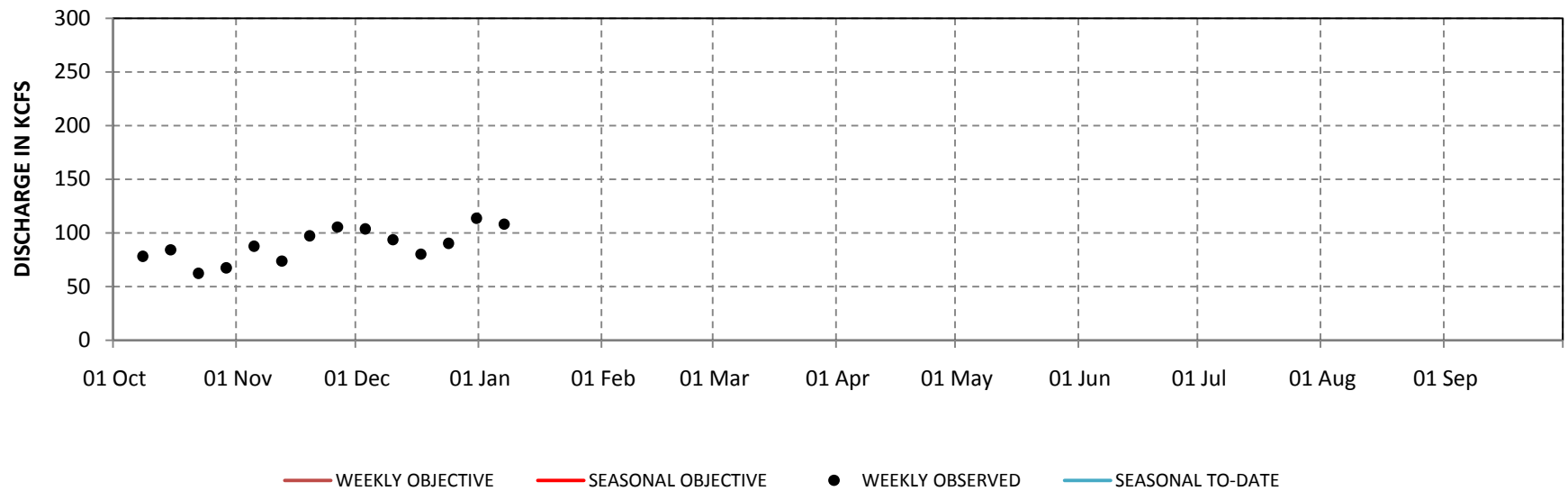
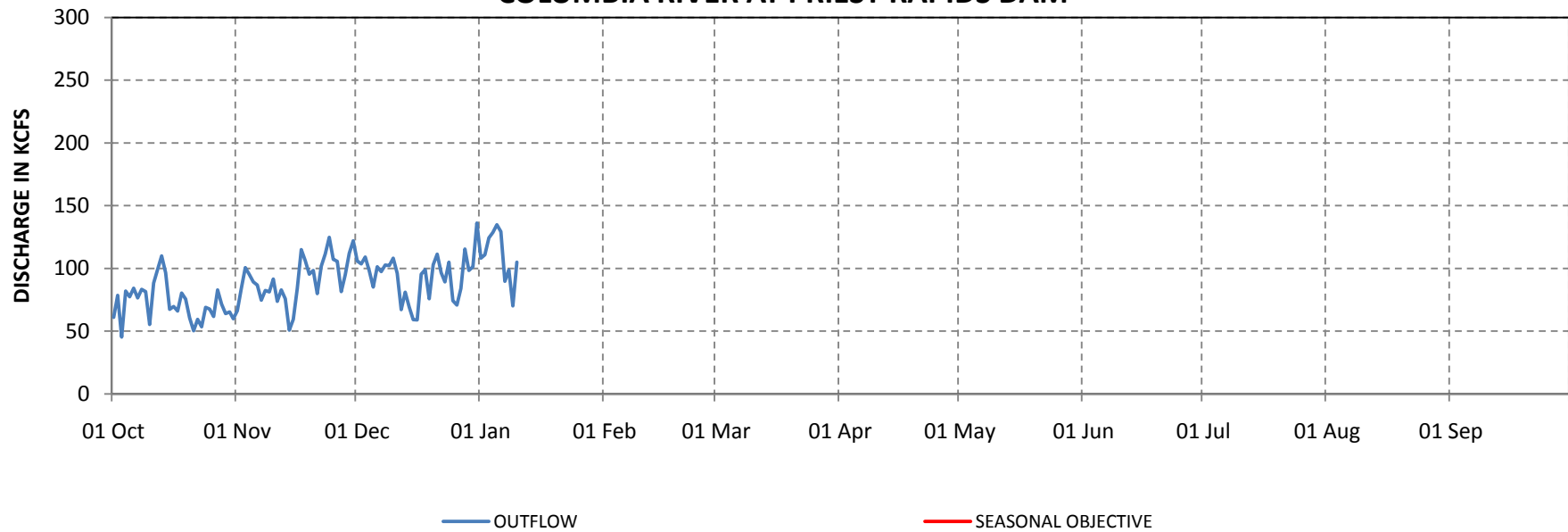


OUTFLOW SEASONAL OBJECTIVE



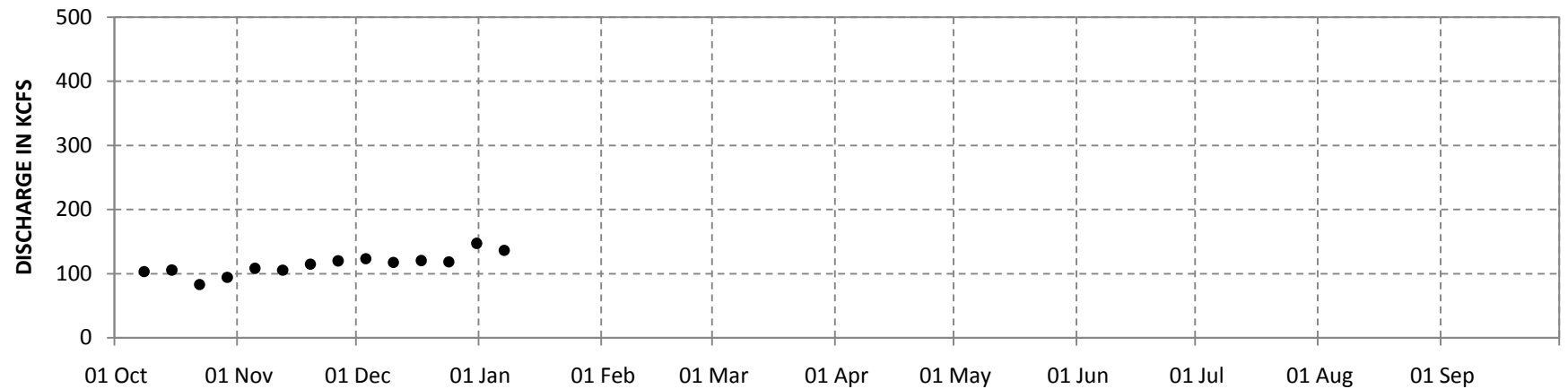
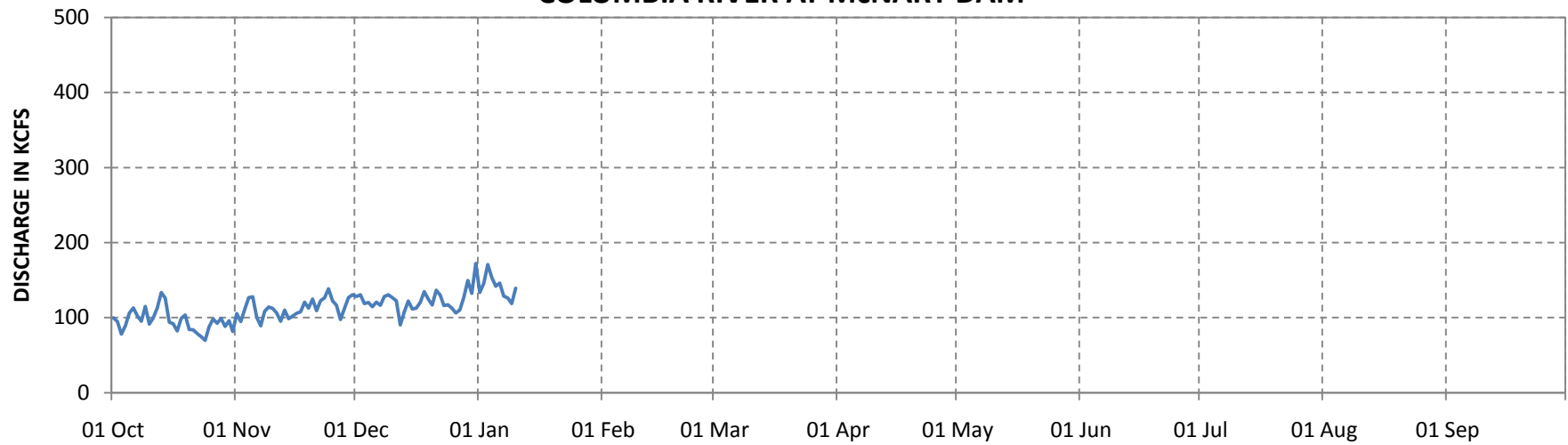
WEEKLY OBJECTIVE SEASONAL OBJECTIVE WEEKLY OBSERVED SEASONAL TO-DATE

PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



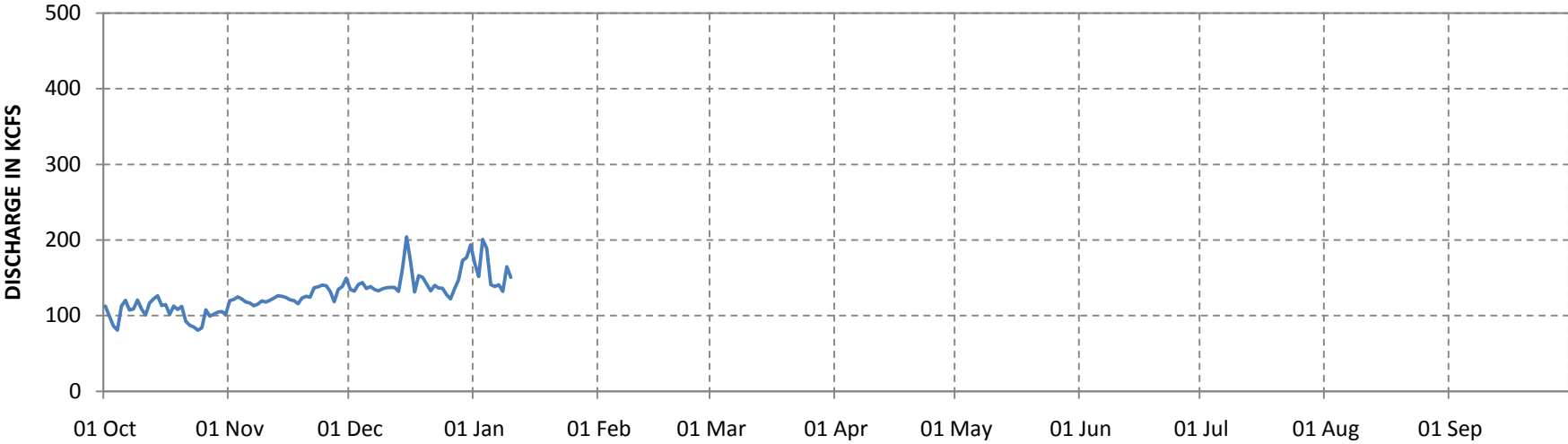
PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM

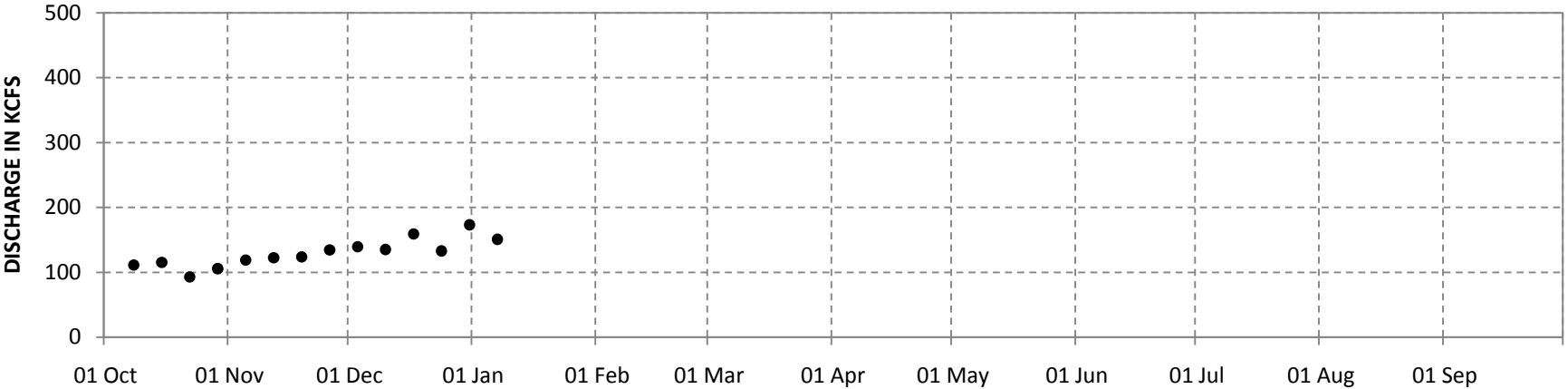


PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT BONNEVILLE DAM



— OUTFLOW — SEASONAL OBJECTIVE



— WEEKLY OBJECTIVE — SEASONAL OBJECTIVE ● WEEKLY OBSERVED — SEASONAL TO-DATE

TECHNICAL MANAGEMENT TEAM

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Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday February 9, 2011 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274
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AGENDA

1. Welcome and Introductions
2. Review December 8 and January 12 Meeting Minutes [\[Meeting Minutes\]](#)
3. Pinniped Update - Robert Stansell, COE-NWP
 - a. [2010 Summary](#)
4. Update on Water Supply Forecasts - Steve Barton, COE-RCC
 - a. [RFC Snow](#)
 - b. [Westwide SNOTEL](#)
5. Dworshak Water Supply Forecasts - Steve Barton, COE-RCC and Steve Hall, COE-NWW
 - a. [Forecast Comparison](#)
6. Fish Operations Plan Update- Steve Barton, COE-RCC
7. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System
 - d. Water Quality

8. Other

- a. Set agenda and date for next meeting - **February 23, 2011**
- b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Dong Baus](#) at (503) 808-3995

Dworshak : February Runoff Forecast & Flood Control Calculation

WY 2011

Runoff Forecast and Flood Control

Most Probable Runoff Volume	Apr-Jul	3142	KAF
	May-Jul	2319	KAF
28/29 Feb Flood Control Space		1510	KAF
28/29 Feb Flood Control Elevation		1496.8	ft

1929-1999
Average

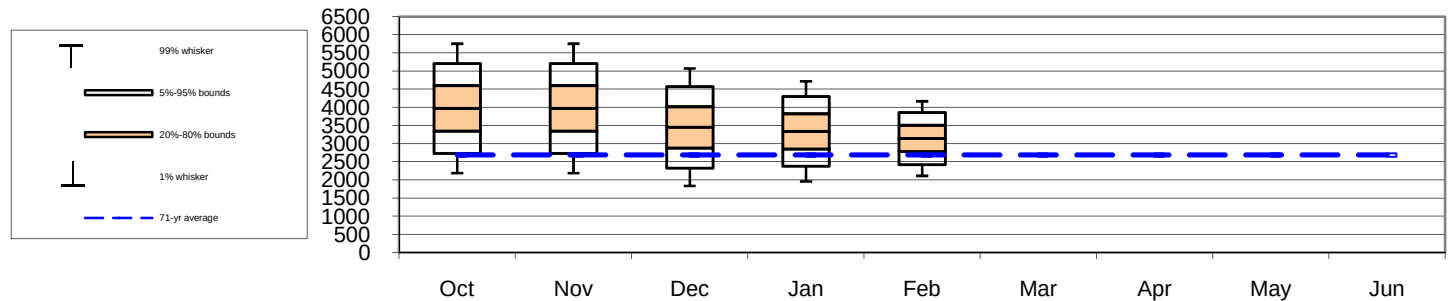
Percent of
Average

2683 117%
1980 117%

Seasonal Flood Control (assumes no shift of flood control space to Grand Coulee)

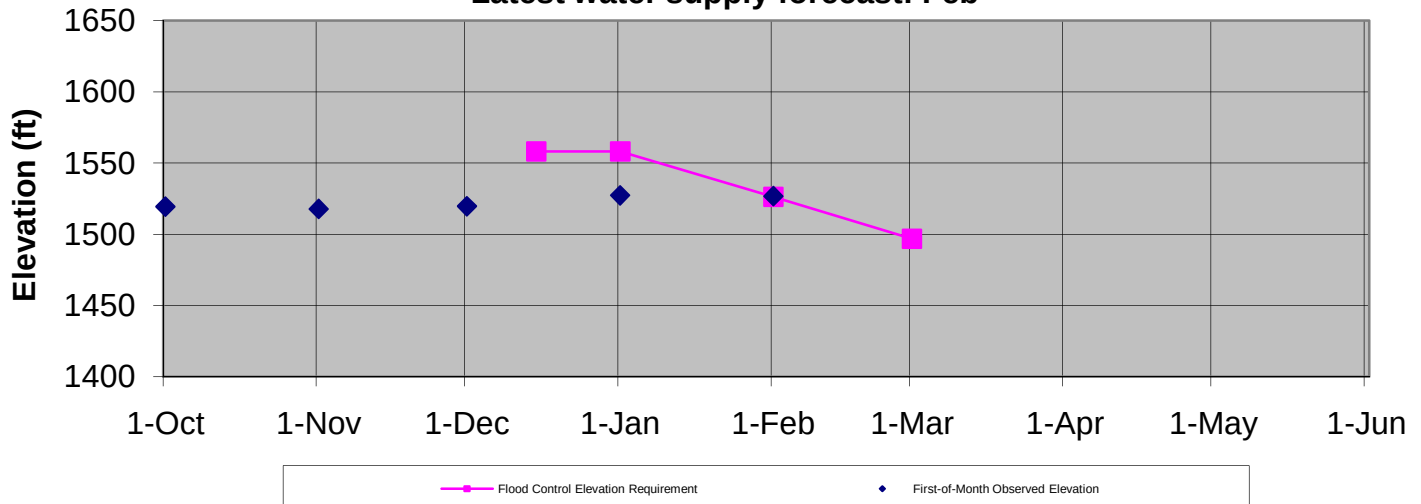
Forecast Date>>	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Apr-Jul Runoff Forecast	3972	3972	3452	3340	3142				
First-of-Month Elev	1519.4	1517.8	1519.7	1527.3	1526.7				
Date >>	15-Dec	31-Dec	31-Jan	28-Feb	31-Mar	15-Apr	30-Apr		
Flood Control Space	--	700	700	1148	1510				
Flood Control Elevation	--	1558.2	1558.2	1526.2	1496.8				

Spread of values around expected forecast



Dworshak Flood Control Elevations - 2011

Latest water supply forecast: Feb



Notes:

1. The given forecast is the official Corps of Engineers forecast for Dworshak. If you have any questions please contact Jeremy Giovando (509 527 7053), or Steve Hall (509 527 7550).
2. Due to updated values for precipitation, snow or streamflow, subsequent forecasts may be different from the forecast published herein.
3. 15-Dec and 31-Dec flood control space is fixed at 700 KAF.

Dworshak : February Runoff Forecast & Flood Control Calculation

Apr-Jul Runoff Forecast Calculation:					
Variable	Month	Observed Value	% of Average	Regression Coefficient	Marginal Runoff (KAF)
		A		B	=A*B
SOI	Sep	2.60		108.05	280.9
Elk Butte SWE	1-Feb	24.20	90%	19.57	473.5
Hemlock Butte SWE	1-Feb	34.50	108%	17.27	595.8
Hoodoo Basin SWE	1-Feb	31.10	103%	19.13	595.0
Pierce SWE	1-Feb	8.20	106%	48.51	397.8
DWR January Inflow	Jan	430.70	211%	0.895	385.5
Intercept		1		413.05	413.1
1-Feb Forecast (KAF)				Σ	3141.6

Data Station	Sept	Nov	Dec	1-Jan	1-Feb	1-Mar	1-Apr	1-May	1-Jun
Climate (Stdzd SOI)									
September SOI	2.60								
Precipitation (monthly depth, inches)									
Headquarters, ID		4.50	5.80						
Snow Water Equiv (first of month SWE depth, inches)									
Elk Butte, ID				13.0	24.2	--	--	--	--
Hemlock Butte, ID				20.2	34.5	--	--	--	--
Hoodoo Basin, MT				17.5	31.1	--	--	--	--
Pierce RS, ID				6.1	8.2	--			
Shanghi Summit, ID							--	--	
Lost Lake, ID								--	--
Streamflow (monthly volume, KAF)				Jan	Feb	Mar	Apr	May	Jun
Dworshak Inflow				431	--	--	--	--	--



Northwest River Forecast Center Product Display

[Return to Previous Page](#)

Statistical Water Supply Forecast

Water Supply Forecasts
Northwest River Forecast Center
Thursday January 27, 2011 at 20:18 GMT

Observed precipitation through the 24th
Future precip is 80% of normal for the next 2 weeks
and 100% of normal for the rest of the period
Snow included in this run
Observed runoff through December
note: current month runoff based on OBSERVED + ESP to the end of JAN

UPPER COLUMBIA BASINS

Feb-11 EarlyBird

Stream and Station			Forecast						Runoff				
			Probable	%	Maximum	%	Minimum	%	Average	PrevYr	CurYR	%	
COLUMBIA RIVER													
MICA RESERVOIR INFLOW, BC			JAN-JUL	9250.0	96	11000.0	114	7530.0	78	9619.	8011	1654	105
			FEB-JUL	8990.0	96	10700.0	114	7280.0	78	9372.	7747	1654	105
			APR-SEP	12000.0	96	13700.0	110	10300.0	82	12500.	10320	1654	105
REVELSTOKE, BC			JAN-JUL	13300.0	96	14800.0	107	11800.0	85	13880.	11770	2222	97
ARROW LAKES INFLOW			JAN-JUL	19800.0	94	22500.0	107	17100.0	82	20960.	16700	3264	83
			FEB-JUL	19200.0	95	21900.0	108	16500.0	82	20230.	16100	3264	83
			APR-SEP	23800.0	95	26500.0	106	21100.0	84	25110.	20070	3264	83
BIRCHBANK, BC (1)			JAN-JUL	37200.0	96	44400.0	114	29900.0	77	38930.	30850	6538	100
			APR-SEP	41300.0	95	48600.0	112	34100.0	78	43500.	35110	6538	100
GRAND COULEE, WA (1)			JAN-JUL	61900.0	98	74400.0	118	49500.0	79	62900.	48550	11890	109
			APR-SEP	61800.0	97	74200.0	116	49300.0	77	63990.	51430	11890	109
ROCK ISLAND DAM BLO, WA (1)			JAN-JUL	68400.0	99	82700.0	120	54100.0	79	68910.	54410	13140	112
			APR-SEP	67500.0	97	81800.0	118	53200.0	77	69540.	57160	13140	112
THE DALLES NR, OR (1)			JAN-JUL	108000.0	101	131000.0	122	85300.0	79	107300.	84720	24650	107
			APR-AUG	90900.0	98	113000.0	121	68300.0	73	93090.	77410	24650	107
			APR-SEP	96300.0	98	119000.0	121	73700.0	75	98650.	82990	24650	107
KOOTENAI RIVER													
LIBBY RES INFLOW, MT (1)			JAN-JUL	6170.0	98	7700.0	122	4640.0	74	6306.	4534	1054	94
			APR-AUG	6110.0	98	7640.0	122	4580.0	73	6248.	4517	1054	94
			APR-SEP	6490.0	98	8020.0	121	4960.0	75	6638.	4959	1054	94
LEONIA, ID (1)			APR-JUL	6920.0	98	8810.0	125	5020.0	71	7041.	5035	1423	99
			APR-SEP	7980.0	98	9880.0	122	6090.0	75	8125.	6027	1423	99
BONNERS FERRY, ID			APR-JUL	7480.0	98	9150.0	120	5780.0	76	7619.	5420	1537	100
KOOTENAY RIVER													
KOOTENAY LAKE INFLOW, BC			JAN-JUL	15600.0	97	18600.0	116	12400.0	77	16010.	11810	2688	103
			APR-SEP	15800.0	96	19100.0	116	12500.0	76	16450.	12620	2688	103
DUNCAN RIVER													
DUNCAN RESERVOIR INFLOW, BC			JAN-JUL	1690.0	94	2110.0	117	1270.0	71	1800.	1489	304	101
			FEB-JUL	1640.0	94	2060.0	118	1220.0	70	1746.	1438	304	101
			APR-SEP	2090.0	94	2510.0	113	1670.0	75	2227.	1821	304	101
CLARK FORK													
BLACKFOOT RIVER ABV, MT			APR-SEP	755.0	107	1150.0	163	365.0	52	704.	654	310	140
MISSOULA ABV, MT			APR-SEP	1760.0	110	2300.0	144	1220.0	76	1595.	1274	450	121
MISSOULA BLO, MT			APR-SEP	3180.0	107	4000.0	135	2360.0	80	2962.	2236	633	102
ST. REGIS, MT (1)			APR-SEP	4230.0	108	5880.0	150	2580.0	66	3907.	2832	702	85
PLAINS NR, MT (1)			APR-SEP	11700.0	106	15000.0	136	8450.0	76	11060.	8623	2191	110
WHITEHORSE RAPIDS, ID (1)			APR-SEP	12800.0	103	16600.0	133	9030.0	72	12460.	9645	2380	103
BLACKFOOT RIVER													
BONNER NR, MT			APR-SEP	1010.0	113	1370.0	154	640.0	72	892.	620	141	94
BITTERROOT RIVER													
AT MOUTH, MT			APR-SEP	1410.0	103	1760.0	129	1050.0	77	1364.	937	224	89
Feb-11 EarlyBird													
Stream and Station			Forecast						Runoff				
			Probable	%	Maximum	%	Minimum	%	Average	PrevYr	CurYR	%	
N.F. FLATHEAD RIVE													
COLUMBIA FALLS NR, MT			APR-SEP	1940.0	108	2320.0	129	1560.0	87	1801.	1519	294	115
M.F. FLATHEAD RIVE													
WEST GLACIER NR, MT			APR-SEP	1830.0	105	2180.0	125	1480.0	85	1740.	1459	271	112
S.F. FLATHEAD RIVE													
HUNGRY HORSE RES IN, MT (1)			JAN-JUL	2380.0	107	2980.0	134	1780.0	80	2224.	1828	338	113
			APR-SEP	2220.0	105	2820.0	133	1620.0	76	2124.	1843	338	113

UPPER/MIDDLE COLUMBIA BASINS

Feb-11 EarlyBird

Feb-11 Earlybird

Stream and Station			Forecast						Runoff			
			Probable	%	Maximum	%	Minimum	%	Average	PrevYr	CurYR	%
FLATHEAD RIVER												
	COLUMBIA FALLS, MT	APR-SEP	6180.0	106	7600.0	130	4760.0	82	5825.	4969	939	113
	FLATHEAD LAKE INFLOW, MT (1)	APR-SEP	7220.0	108	9050.0	135	5390.0	80	6713.	6041	1362	137
PRIEST RIVER												
	PRIEST RIVER, ID (1)	APR-JUL	825.0	101	1120.0	138	535.0	66	814.	752	248	126
PEND OREILLE RIVER												
	PEND OREILLE LAKE IN, ID (1)	APR-SEP	14300.0	103	18500.0	133	10200.0	73	13910.	11470	3240	117
		APR-JUL	13100.0	103	17300.0	136	8940.0	70	12740.	10250	3240	117
	BOX CANYON BLO, WA (1)	APR-SEP	14600.0	104	18400.0	131	10800.0	77	14090.	11630	3368	118
KETTLE RIVER												
	LAURIER NR, WA	APR-SEP	1860.0	94	2330.0	118	1390.0	70	1972.	1693	137	89
COEUR D'ALENE RIVE												
	ENAVILLE, ID (1)	APR-SEP	795.0	102	1050.0	135	545.0	70	778.	692	534	201
		APR-JUL	755.0	102	1010.0	137	505.0	68	739.	651	534	201
	COEUR D'ALENE LAKE IN, ID	APR-JUL	2540.0	100	3310.0	130	1760.0	69	2552.	2054	1487	169
SPOKANE RIVER												
	SPOKANE, WA (1)	APR-SEP	2560.0	93	2710.0	99	2400.0	87	2744.	2163	1614	174
ST JOE RIVER												
	CALDER, ID	APR-SEP	1190.0	99	1480.0	123	890.0	74	1205.	883	378	149
		APR-JUL	1140.0	100	1440.0	127	840.0	74	1136.	817	378	149
OKANAGAN RIVER												
	TONASKET NR, WA (1)	APR-SEP	1550.0	88	2360.0	134	750.0	42	1766.	1528	266	87
SIMILKAMEEN RIVER												
	NIGHTHAWK NR, WA (1)	APR-JUL	1260.0	93	1840.0	136	670.0	50	1350.	1222	174	96
		APR-SEP	1350.0	93	1940.0	134	765.0	53	1450.	1312	174	96
METHOW RIVER												
	PATEROS NR, WA (1)	APR-SEP	915.0	93	1330.0	135	505.0	51	985.	1113	140	120
CHELAN RIVER												
	LAKE CHELAN INFLOW, WA (1)	APR-SEP	1050.0	89	1270.0	107	815.0	69	1185.	1201	262	127
WENATCHEE RIVER												
	PESHASTIN, WA	APR-SEP	1410.0	86	1990.0	122	835.0	51	1635.	1485	509	127

YAKIMA AND MAINSTEM SNAKE BASINS

Feb-11 EarlyBird

Stream and Station			Forecast						Runoff			
			Probable	%	Maximum	%	Minimum	%	Average	PrevYr	CurYr	%
YAKIMA RIVER												
KEECHELUS LAKE IN, WA (1)	APR-SEP		120.0	90	154.0	116	85.0	64	133.	127	99	119
CLE ELUM, WA	APR-SEP		810.0	90	985.0	109	635.0	70	903.	830	497	123
PARKER NR, WA	APR-SEP		1760.0	92	2170.0	113	1340.0	70	1918.	1977	1115	128
KACHESS RIVER												
KACHESS LAKE INFLOW, WA (1)	APR-SEP		107.0	89	135.0	113	78.0	65	120.	108	83	124
CLE ELUM RIVER												
CLE ELUM LAKE INFLOW, WA (1)	APR-SEP		405.0	90	495.0	110	315.0	70	448.	426	215	138
NACHES RIVER												
NACHES NR, WA	APR-SEP		770.0	92	935.0	112	605.0	72	837.	926	381	140
BUMPING RIVER												
BUMPING LAKE INFLOW, WA (1)	APR-SEP		127.0	95	161.0	120	93.0	69	134.	128	62	124
TIETON RIVER												
RIMROCK LAKE INFLOW, WA (1)	APR-SEP		230.0	95	285.0	118	176.0	73	242.	232	115	129
AHTANUM CREEKS												
TAMPICO NR, WA	APR-SEP		43.0	93	62.0	135	24.0	52	46.	0		
SNAKE RIVER												
JACKSON LAKE INFLOW, WY (1)	APR-JUL		900.0	110	1090.0	134	710.0	87	815.	628	109	76
	APR-SEP		1000.0	111	1190.0	132	810.0	90	904.	681	109	76
PALISADES RES INFLOW, ID (1)	APR-JUL		3730.0	112	4600.0	138	2860.0	86	3331.	2446	684	89
	APR-SEP		4340.0	112	5210.0	134	3470.0	90	3875.	2890	684	89
HEISE NR, ID	APR-JUL		3990.0	112	4960.0	139	3010.0	85	3561.	2595	713	81
	APR-SEP		4660.0	112	5640.0	136	3690.0	89	4159.	3099	713	81
SHELLEY NR, ID (1)	APR-JUL		5260.0	119	6250.0	141	4270.0	96	4428.	3209	1065	79
	APR-SEP		6320.0	119	7310.0	137	5330.0	100	5324.	3823	1065	79
BLACKFOOT NR, ID (1)	APR-JUL		5300.0	115	6300.0	137	4290.0	93	4604.	0		
AMER. FALLS RES IN, ID (1)	APR-JUL		3720.0	115	5110.0	158	2330.0	72	3242.	1562	1253	72
MILNER, ID	APR-JUL		1360.0	111	2480.0	202	375.0	31	1228.	254	334	34
KING HILL, ID (1)	APR-JUL		2990.0	98	4170.0	137	1810.0	59	3045.	1891	1835	64
MURPHY NR, ID (1)	APR-JUL		3160.0	102	4400.0	142	1910.0	62	3092.	1787	2114	71
WEISER, ID (1)	JAN-JUL		10000.0	102	12900.0	132	7160.0	73	9793.	6342	2910	71
	APR-JUL		6030.0	105	8870.0	154	3180.0	55	5765.	4009	2910	71
	APR-SEP		7500.0	104	10300.0	143	4650.0	65	7192.	5159	2910	71
BROWNLEE RES INFLOW	APR-JUL		6720.0	106	9480.0	150	3960.0	63	6313.	4586	3199	73
	APR-SEP		8190.0	105	10900.0	140	5430.0	70	7801.	5786	3199	73
HELLS CANYON, ID (1)	APR-JUL		6880.0	106	9930.0	153	3830.0	59	6493.	4843	3310	76
	APR-SEP		8390.0	105	11400.0	143	5340.0	67	7977.	6044	3310	76
LOWER GRANITE RES IN, WA (1)	JAN-JUL		32600.0	109	41900.0	140	23300.0	78	30020.	22460	6914	92
	FEB-SEP		32600.0	107	41900.0	138	23300.0	77	30370.	23320	6914	92
	APR-JUL		23000.0	107	32300.0	150	13700.0	64	21550.	17870	6914	92
	APR-SEP		25800.0	107	35100.0	145	16500.0	68	24140.	20220	6914	92

UPPER SNAKE BASINS

Feb-11 EarlyBird

Stream and Station			Forecast			Runoff		
			Probable %	Maximum %	Minimum %	Average	PrevYr	CurYr %
GREY'S RIVER								
PALISADES ABV, WY	APR-SEP		470.0 119	580.0 147	360.0 91	394.	320	64 98
SALT RIVER								
ETNA NR, WY	APR-JUL		410.0 120	560.0 164	265.0 77	342.	260	116 87
HENRYS FORK								
ASHTON NR, ID	APR-JUL		595.0 104	730.0 128	455.0 80	571.	403	256 73
ST. ANTHONY, ID	APR-JUL		770.0 105	1030.0 140	510.0 69	734.	514	313 78
REXBURG NR, ID	APR-JUL		1620.0 104	2030.0 130	1210.0 78	1559.	590	382 57
FALLS RIVER								
SQUIRREL NR, ID (1)	APR-JUL		410.0 106	490.0 127	325.0 84	386.	219	62 51
TETON RIVER								
ST. ANTHONY NR, ID	APR-JUL		425.0 105	575.0 143	275.0 68	403.	366	101 86
BIG LOST RIVER								
MACKAY RESERVOIR INFLOW, ID	APR-JUL		151.0 106	230.0 162	71.0 50	142.	110	39 75
WILLOW CREEK								
RIRIE RESERVOIR INFLOW	APR-JUL		96.0 112	139.0 162	53.0 62	86.	38	
PORTNEUF RIVER								
TOPAZ, ID	APR-SEP		105.0 111	133.0 140	78.0 82	95.	73	21 55
GOOSE CREEK								
OAKLEY RES INFLOW, ID	APR-JUL		32.0 110	52.0 179	12.8 44	29.	0	
BIG WOOD RIVER								
HAILEY, ID (1)	APR-JUL		275.0 107	405.0 158	147.0 57	256.	195	34 73
MAGIC RESERVOIR INFLOW, ID	APR-JUL		320.0 110	530.0 182	111.0 38	291.	159	21 65
LITTLE WOOD RIVER								
CAREY NR, ID	APR-JUL		93.0 107	140.0 161	45.0 52	87.	55	13 81

MIDDLE SNAKE BASINS

Feb-11 EarlyBird

Stream and Station			Forecast			Runoff		
			Probable %	Maximum %	Minimum %	Average	PrevYr	CurYr %
BRUNEAU RIVER								
HOT SPRING NR, ID	APR-JUL		255.0 123	370.0 178	138.0 66	208.	176	42 131
OWYHEE RIVER								
OWYHEE RES INFLOW, OR	MAR-JUL		775.0 126	1230.0 201	320.0 52	613.	364	288 226
OWYHEE RES OUTFLOW	APR-JUL		220.0 101	675.0 311	14.8 7	217.	44	11 41
BOISE RIVER								
TWIN SPRINGS NR, ID (1)	APR-JUL		685.0 108	845.0 133	520.0 82	636.	619	157 138
BOISE NR, ID (1)	APR-JUL		1550.0 110	2050.0 145	1060.0 75	1414.	1128	276 104
PARMA NR, ID	APR-JUL		550.0 93	1000.0 169	136.0 23	593.	365	227 78
S.F. BOISE RIVER								
ANDERSON RNCH RES IN, ID (1)	APR-JUL		595.0 110	715.0 132	480.0 89	542.	400	89 109
MALHEUR RIVER								
DREWSEY NR, OR	MAR-JUL		138.0 125	205.0 186	72.0 65	110.	98	35 137
N.F. MALHEUR RIVER								
BEULAH RES INFLOW, OR (1)	MAR-JUL		101.0 125	136.0 168	66.0 81	81.	72	22 115
PAYETTE RIVER								
HORSESHOE BEND NR, ID (1)	APR-JUL		1740.0 108	2300.0 142	1180.0 73	1617.	1437	316 87
EMMETT NR, ID	APR-JUL		1410.0 113	2020.0 162	805.0 65	1246.	1170	308 80
DEADWOOD RIVER								
DEADWOOD RES INFLOW, ID (1)	APR-JUL		147.0 110	186.0 139	108.0 81	134.	117	22 102
N.F. PAYETTE RIVER								
CASCADE RES INFLOW, ID (1)	APR-JUL		530.0 107	695.0 140	365.0 74	495.	482	103 81
WEISER RIVER								
WEISER NR, ID (1)	APR-JUL		415.0 106	650.0 166	182.0 47	391.	424	146 112
BURNT RIVER								
HEREFORD NR, OR	MAR-JUL		62.0 122	86.0 169	38.0 75	51.	30	12 100

LOWER SNAKE AND CENTRAL OREGON BASINS

Feb-11 EarlyBird

Stream and Station			Forecast			Runoff		
			Probable %	Maximum %	Minimum %	Average	PrevYr	CurYr %
POWDER RIVER								
SUMPTER NR, OR	MAR-JUL		84.0 120	105.0 150	62.0 89	70.	58	10 125
IMNAHA RIVER								
IMNAHA, OR	MAR-JUL		345.0 115	435.0 145	250.0 83	301.	306	30 60
SALMON RIVER								
SALMON, ID (1)	APR-JUL		920.0 107	1300.0 152	545.0 64	857.	837	280 90
WHITEBIRD, ID (1)	JAN-JUL		7340.0 108	9400.0 138	5280.0 78	6805.	6032	1067 89
	APR-JUL		6350.0 109	8410.0 144	4300.0 73	5851.	5344	1067 89
GRANDE RONDE RIVER								
LA GRANDE, OR	MAR-JUL		265.0 106	345.0 139	184.0 74	249.	251	46 105
	APR-JUL		196.0 107	275.0 149	116.0 63	184.	227	46 105
TROY, OR (1)	MAR-JUL		1670.0 106	2240.0 142	1100.0 70	1578.	1404	475 121
	APR-JUL		1330.0 104	1900.0 149	760.0 60	1274.	1300	475 121
CLEARWATER RIVER								

OROFINO, ID (1)	APR-JUL	4780.0	103	6540.0	141	3020.0	65	4645.	3837	968	117
SPALDING, ID (1)	JAN-JUL	10600.0	109	13600.0	140	7670.0	79	9683.	6936	2031	129
	APR-JUL	7620.0	102	10600.0	143	4640.0	62	7435.	5982	2031	129
	APR-SEP	8070.0	103	11100.0	141	5100.0	65	7849.	6390	2031	129
N.F. CLEARWATER RI											
DWORSHAK RES INFLOW, ID (1)	JAN-JUL	3880.0	109	5010.0	141	2740.0	77	3547.	2306	821	125
	APR-JUL	2720.0	103	3860.0	146	1580.0	60	2644.	1906	821	125
	APR-SEP	2840.0	101	3980.0	142	1700.0	61	2803.	2037	821	125
S.F. WALLA WALLA R											
MILTON NR, OR	APR-JUL	62.0	117	80.0	151	44.0	83	53.	62	45	122
UMATILLA RIVER											
GIBBON NR, OR	APR-JUL	86.0	118	117.0	160	54.0	74	73.	86	59	133
PENDLETON, OR	APR-JUL	184.0	123	255.0	171	113.0	76	149.	198	186	186
M.F. JOHN DAY RIVE											
RITTER, OR (1)	MAR-JUL	194.0	121	250.0	156	137.0	86	160.	0		
	APR-JUL	151.0	123	210.0	171	93.0	76	123.	0		
N.F. JOHN DAY RIVE											
MONUMENT NR, OR	APR-JUL	735.0	123	1010.0	169	465.0	78	597.	627	323	208
JOHN DAY RIVER											
SERVICE CREEK, OR (1)	MAR-SEP	1410.0	122	1900.0	165	925.0	80	1153.	990	499	189
	APR-SEP	1060.0	123	1550.0	179	570.0	66	865.	889	499	189
DESCHUTES RIVER											
BENHAM FALLS, OR	APR-SEP	550.0	104	620.0	117	485.0	92	528.	437	333	99
Feb-11 EarlyBird											
		Forecast				Runoff					
Stream and Station		Probable	%	Maximum	%	Minimum	%	Average	PrevYr	CurYr	%
CROOKED RIVER											
PRINEVILLE RES INFLOW, OR	MAR-JUL	205.0	111	300.0	163	113.0	61	184.	171	94	190
OCHOCO CREEK											
OCHOCO RES INFLOW, OR	MAR-JUL	41.0	114	57.0	158	25.0	69	36.	32		

WESTSIDE AND SOUTHERN OREGON BASINS

Feb-11 EarlyBird

		Forecast				Runoff					
Stream and Station		Probable	%	Maximum	%	Minimum	%	Average	PrevYr	CurYr	%
SKAGIT RIVER											
CONCRETE NR, WA	APR-SEP	6150.0	97	7780.0	122	4530.0	71	6365.	5685	3477	106
COWLITZ RIVER											
MAYFIELD RES INFLOW, WA	JAN-JUL	3400.0	106	4500.0	140	2310.0	72	3217.	3010	2109	120
	APR-JUL	1550.0	92	2640.0	156	450.0	27	1689.	1873	2109	120
	APR-SEP	1760.0	92	2860.0	149	660.0	34	1922.	2139	2109	120
	APR-SEP	2400.0	91	3940.0	149	850.0	32	2639.	3007	3224	117
	JAN-JUL	4940.0	105	6490.0	138	3390.0	72	4709.	4396	3224	117
CASTLE ROCK, WA											
LEWIS RIVER											
ARIEL, WA	JAN-JUL	2500.0	106	2890.0	123	2100.0	89	2351.	2215	1762	115
MCKENZIE RIVER											
VIDA NR, OR	APR-SEP	1240.0	103	1530.0	127	950.0	79	1201.	1410	1329	115
S. SANTIAM RIVER											
WATERLOO, OR	APR-SEP	605.0	103	875.0	149	335.0	57	587.	873	1245	118
N. SANTIAM RIVER											
MEHAMA, OR	APR-SEP	860.0	103	1150.0	138	580.0	70	834.	1114	1367	126
WILLAMETTE RIVER											
SALEM, OR	APR-SEP	4900.0	102	6580.0	137	3220.0	67	4804.	6762	8919	114
CLACKAMAS RIVER											
ESTACADA, OR	APR-SEP	760.0	102	970.0	130	555.0	74	748.	904	896	107
N. UMPQUA RIVER											
LEMOLO LAKE INFLOW, OR (1)	APR-SEP	157.0	104	200.0	132	112.0	74	151.	124	65	72
	JAN-JUL	176.0	97	220.0	122	131.0	72	181.	144	65	72
ROGUE RIVER											
RAYGOLD, OR	APR-SEP	915.0	103	1210.0	136	615.0	69	889.	808	843	103
	JAN-JUL	1650.0	104	1940.0	122	1350.0	85	1584.	1061	843	103
CHEWAUCAN RIVER											
PAISLEY NR, OR	MAR-JUL	112.0	126	152.0	171	72.0	81	89.	16		
SILVIES RIVER											
BURNS NR, OR	MAR-JUL	151.0	117	230.0	178	71.0	55	129.	80	23	152
	APR-SEP	116.0	117	196.0	198	36.0	36	99.	70	23	152

Forecasts are selected from those prepared by:

National Weather Service
 Natural Resource Conservation Service
 B.C. Hydro and Power Authority.

Project inflow forecasts have been coordinated with the
 U.S. Army Corp of Engineers and U.S. Bureau of Reclamation.

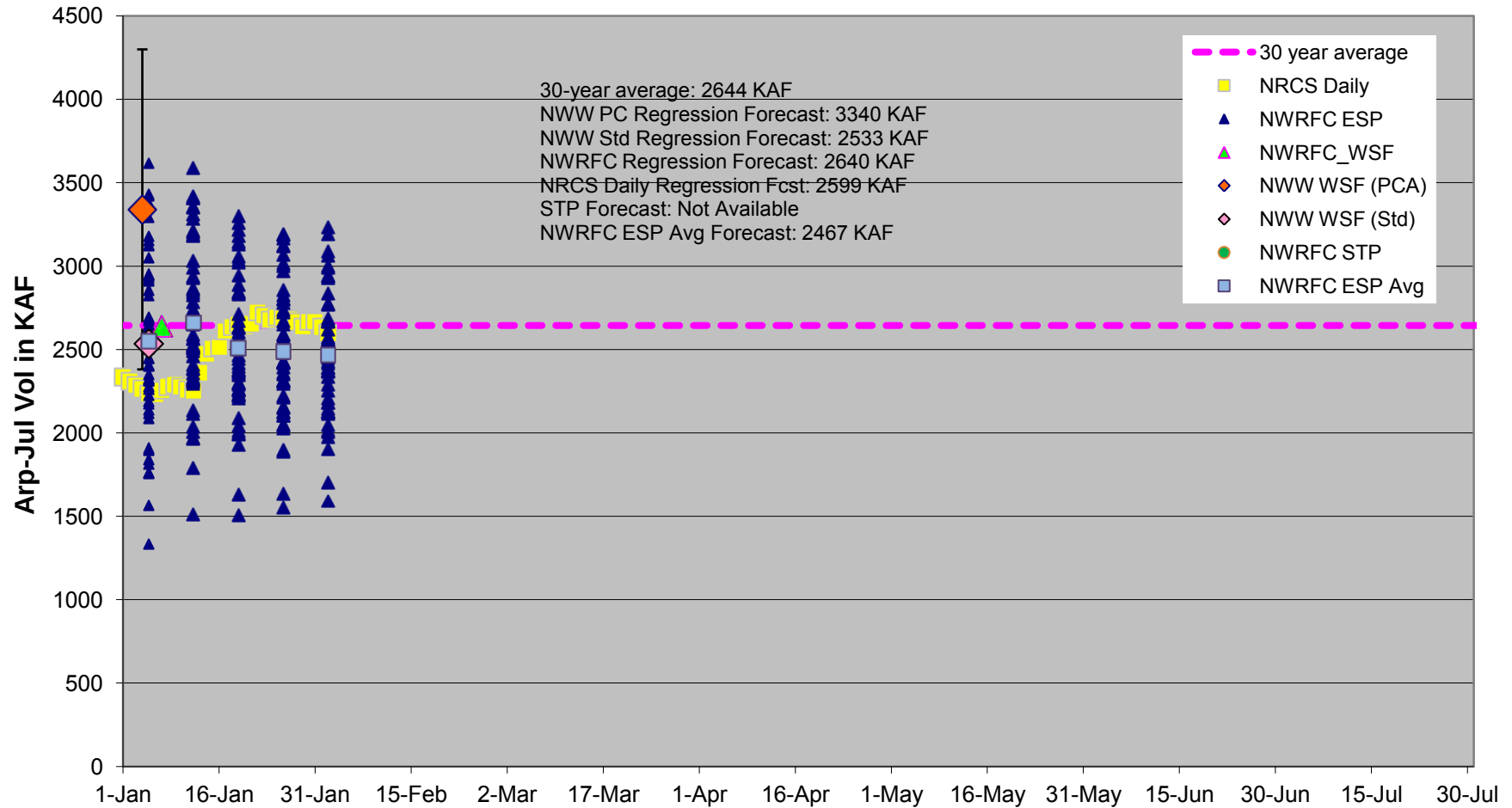
All forecasts are in thousands of acre-feet.
 All averages are for the period 1971 through 2000

NOAA/NWS/Northwest River Forecast Center
 NNNN

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Dworshak, ID April-July Inflow Volume Forecast Comparison

updated 02-Feb-2011



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

February 9, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator//Notes: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Review of Meeting Minutes for December 8 Year End Review and January 12, 2011 Meeting

With no additional changes to the sets of notes under review, they were considered final.

Pinnipeds Report

Robert Stansell, COE, provided a 2010 report on the Pinnipeds management program at Bonneville Dam. Pinniped abundance rose in 2010 for both California Sea Lions (CSL) and Steller Sea Lions (SSL). This came as a surprise since 2009 saw a drop in numbers. Many entering the system were ‘new’ animals, and those present at the dam per day and total # of days had dropped from previous years. SSL counts were higher than CSLs for the first time, indicating a growing problem and concern to the managing agencies. Total salmon consumption was up but a lower percentage was taken given the high fish run counts from this past year. Sturgeon consumption had increased and Robert noted that these counts may be underestimated given that sturgeon are taken further away from the dam than Chinook, and observation capabilities further out are not as good as right at the dam. Lamprey predation, he reported, was lower than previous years. He shared information about non-lethal deterrents used in 2010 that included Sea Lion Exclusion Devices, acoustic techniques, hazing and use of concrete blocks to prevent haul out. Over the period 2008-2010 during program implementation, 40 animals were trapped and removed. Trap and removal efforts fell short of the 90 animals anticipated/targeted for removal over this period of time.

A Pinnipeds-Fishery Interaction Task Force reconvened in October and November 2010 to review the program they had a role in developing based on their last round of deliberations in 2007, and submitted recommendations in a report released on December 12. Within that report, the majority of the task force recommended making it easier to remove nuisance animals, including increased traps and trapping capabilities, allowing for shooting, and loosening the requirements around ‘identifiable animals’ criteria that would enable trapping and removal. Just after the Task Force met, the 9th Circuit Court of Appeals ruled that NOAA had not sufficiently explained that California sea lion predation at Bonneville was “significant”, in light of comparisons to human harvest levels allowed. NOAA has since then accepted the court’s ruling and plans to address those concerns and formulate a new Pinniped program by March 2011. In the meantime, monitoring and non-lethal hazing efforts continue. Robert shared that as of 2011, no CSLs have been observed (a first for this time of year) and a higher than average number

of SSLs have been observed. Sturgeon take is also higher than the average. Removal efforts will remain discontinued until NOAA releases its revised program.

Robert responded to a question about injured fish: Some estimates show that about 1% of those caught by pinnipeds get away, and 15-30% of the fish have marine mammal marks (not necessarily from pinnipeds at Bonneville).

In closing, he said that the weekly reports he and his crew produce will continue to be posted to the TMT web page for anyone interested in continuing to follow this program.

Water Supply Forecasts

Karl Kanbergs, COE, shared information from the COE, RFC and other February final forecasts and provided a SNO link to show snow pack estimates. He reported that current snow conditions and water supply in the north and northeast part of the basin are normal to above normal, while along the west they are below normal. Total water supply forecast at The Dalles was 99% of average, and 105% of average at Libby. The Clearwater was showing 90-109% of normal snow pack. The current high pressure conditions are expected to give way to a wetter and more seasonal pattern for most of February according to the latest information from the National Weather Service. Specific to Dworshak, Karl and Steve Hall, Walla Walla District, acknowledged the difference between the COE's official forecast and the RFC's February final forecast (showing the Corp's forecast to be 362 kaf higher than the RFC's)) and suggested that in general, the COE will continue to monitor and coordinate in response to changing conditions with its regional partners. Karl said the COE would provide a formal response to a Joint Technical Staff memo that was sent to the COE raising concerns about these discrepancies and the implications on current and spring operations, and suggesting the COE use caution with how they manage the system to enable flexibility later in the spring during fish migration and the need to provide critical flows. In looking at the various forecasts on the graph provided, Karl noted that the differences were to be expected for this time of year, and Traci Schwarz, Walla Walla District, added that the NWW 'standard' forecast, used by the Walla Walla District over the last 20 years as a back up check to the official forecast, did not show much difference from the RFC forecast.

TMT members asked questions about the differences in methodology between the RFC and COE forecasts and suggested that perhaps one of the biggest differences is the use of the January observed inflows in the COE's equation. These methodologies are continually reviewed by a Columbia River Forecasting Group and this particular issue will be reviewed internal to the COE and with that group. TMT members also acknowledged the challenges the action agencies face in managing operations with changing weather conditions and multiple needs, and said they trusted that the COE understands and is striving to meet the multiple needs of the river. Russ Kiefer, Idaho, also noted that concerns had been raised about entrainment of overwintering kokanee at Dworshak, and said he would follow up with more details and would request to revisit this if it were a significant concern.

Suggestions were made to the COE for exploring options around managing Dworshak operations under these unique and uncertain weather conditions. They included:

- Consider a flood control swap between Grand Coulee and Dworshak. COE response: This option is currently being explored as a way to take the pressure off of the end of month flood control target at Dworshak.
- Reduce flows to 7.4 kcfs this week and continue until the precipitation begins to pick up again before returning to the current full powerhouse operation (~10 kcfs). COE response: The COE will track the conditions closely and could potentially modify operations as early as next week. That said, all options are linked and need to consider the suite of needs/impacts in the system, both near and longer term.
- Discuss the possibility of a TDG waiver with Idaho and the Nez Perce Tribe. Russ Kiefer, Idaho, suggested that while the State would likely not support a 'plan' to exceed TDG, they might be willing to discuss risk management around TDG as it relates to providing a spring flow benefit to migrating endangered fish.

Planned Operation/Next Step Actions: Dworshak will continue to operate at full powerhouse while the COE does an internal review of the varying forecasts and explores options for managing the project to best meet current and spring needs. The agency will provide a written response to the Joint Technical Memo, will work with the Columbia River Forecasting Group, and will engage TMT members at the appropriate time to continue discussing the operation. Karl will send a status update email to TMT no later than next Wednesday, 2/16 regarding Dworshak operations. Unless there is a need to convene a conference call sooner to discuss this operation, TMT will revisit at their next scheduled meeting on 2/23.

Fish Operations Plan

Doug Baus, COE, reported that internal coordination on the Fish Operations Plan was underway and a draft for external review was expected to be released on 2/18. This will be posted to the TMT web page prior to and discussed at the 2/23 TMT meeting. CRITFC noted that this FOP would be split in to spring and summer documents. Doug will check internally and update TMT at the next meeting as to when they can expect to see the summer plan draft.

Operations Review

Reservoirs: Karl Kanbergs reported on COE projects: Libby was at elevation 2405.58 feet with 2.4 kcfs in and 19.6 kcfs out. Albeni Falls was at elevation 2055.7 feet, with 22.6 kcfs out. Priest Rapids day average outflows were 153 kcfs. Dworshak was at elevation 1519.24 feet with 4.5 kcfs in and 10.7 kcfs out. Flows at Lower Granite averaged 40 kcfs, flows at McNary averaged 202 kcfs; and flows at Bonneville averaged 214 kcfs. John Roache reported on Reclamation projects: Grand Coulee was at elevation 1279.1 feet and targeting spring elevations. Hungry Horse was at elevation 3532.8 feet with 9 kcfs out. The water supply forecast at Hungry Horse was 117% of normal. John also noted that a one-day generator test planned for next week might produce an increase in TDG due to spill through the jet valves; Reclamation had coordinated with its state, federal and tribal partners on this and planned to monitor conditions closely.

Fish: Nothing to report.

Power: Nothing to report.

Water quality: Nothing to report.

Next TMT Meeting, February 23, 9:00 am:

Agenda items will include:

- Updated Weather and Water Supply Forecasts
- Dworshak Operation
- Fish Operations Plan
- Operations Review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

February 9, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Karl Kanbergs, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of NOAA, the COE, BOR, Washington, BPA, Idaho, CRITFC, Umatilla Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any comments on these notes can be brought to the chair or the next TMT meeting.

2. Review Meeting Minutes for December 8 and January 12

There were no comments today on the official minutes and facilitator's notes for the December 9 year-end review or the January 12 TMT meeting, so these were all deemed final.

3. Pinniped Update

Robert Stansell, COE, gave an update on pinniped abundance in 2010, predation estimates, and the effect on salmon returns. He also discussed the pinniped removal program and presented recommendations from a November 2010 meeting of the regional pinniped task force.

Abundance and predation counts. The population of Steller sea lions observed in the vicinity of Bonneville Dam is rapidly increasing. In 2010, Stellers often filled the four traps intended for trapping and removal of California sea lions, and up to 54 of the federally protected species were observed in the Bonneville area in a single day.

The past year brought an increase in both Steller and California sea lion populations. This was surprising because the California sea lion removal program, which began in 2008, was followed by a population drop in 2009 which was expected to continue. Many of the sea lions that showed up at Bonneville in 2010 were new to the area. There were also significant increases in both Steller and California sea lion predation; much of that was due to growing predation by Stellers. Sea lions in 2010 took over 6,000 salmonids in the Bonneville tailrace, as compared to 4,400 salmonids in 2009. The percentage of the Chinook run lost to pinnipeds was only 2.2% because the 2010 run was so large. Steller sea lions also took more than 1,800 sturgeon just at Bonneville Dam.

Researchers in 2010 broke the Bonneville observation area into zones, spotlighting areas where predation was highest. While most California sea lion catches of Chinook occurred near the face of the dam, Steller sea lion predation on Chinook was equally distributed around the project. It appears that the sea lions are getting bolder and are less deterred by hazing.

Sea lions also took sturgeon in 2010, predominantly in the downstream zones. The amount of sturgeon predation in zone 7 is unknown because that area cannot be observed. Stansell noted that if the focus were on sturgeon instead of salmon, more observation sites would be needed. Sturgeon predation by sea lions typically begins in November, peaks from January to March and ends in early April. Monitoring of sea lion predation begins in January.

In 2010 a few steelhead were taken during the monitoring period, but once the large Chinook run showed up, sea lions preyed mainly on them. Very few lamprey were taken in 2010, even fewer than in 2002. This probably reflects the small number of lamprey counted at Bonneville last year.

Nonlethal deterrents. The most effective deterrents are sea lion exclusion devices, which have been 100% successful at keeping sea lions out of the Bonneville fishway. Acoustic deterrents used through 2010 were found to be ineffective. Hazing continued in 2010 with limited effectiveness.

To date, the trapping and removal program has removed a total of 40 sea lions (11 in 2008, 15 in 2009, and 14 in 2010). That's about a third of the program goal to remove at least 30 sea lions per year. California sea lions removed in 2010 had been in the Bonneville area for an average of 101 days and had taken at least 91 salmon, as compared to an average of 64 days and 65 salmon for all listed California sea lions. These findings indicate that the biggest offenders were successfully targeted.

Pinniped task force recommendations. This multi-agency task force was scheduled to meet after the third year of the removal program. Their report, released in December 2010, gave four basic recommendations:

1. Reduce the requirements to qualify California sea lions for removal.
2. End mandatory hazing efforts; increase trapping and removal. Limit haul-out sites.
3. Implement shooting as a tool to remove targeted California sea lions.
4. Explore new ways of marking so more individuals can be identified for removal.

Paul Wagner, NOAA, asked whether injury estimates are included in the reports of salmon consumed. The researchers have been tracking marine mammal marks on fish, which have been increasing and are seen on 15-30% of fish in the area, Stansell replied. These fish are coming from the estuary and the lower river, not just from Bonneville Dam.

4. Update on Water Supply Forecasts

Karl Kanbergs, COE, reported on snowpack and weather forecasts for the basin. Snowpack is below average on the west side of the Cascades and above average to average on the east side and near normal within the northern portions

of the basin. The April-August Northwest River Forecast Center's water supply forecast for The Dalles is 99% of average and for Libby (COE forecast) it is 105% of average. Precipitation in January followed by warm weather brought rain to the west side and melted snow in the Cascades. During that period, the higher elevation sites in British Columbia and the Rockies accumulated significant snowpack. The current SNOTEL map illustrates that snowpack conditions go from below average to average and above average, moving from west to east. The Clearwater basin is 90-109% of normal in terms of current snowpack.

The current 30-day forecast calls for above average precipitation in the Columbia basin. Northern areas and portions of Idaho and Montana have seen some recent precipitation. Long-term modeling indicates that the water supply will equalize by the second half of February, with more precipitation west of the Cascades.

5. Dworshak Water Supply Forecasts

Kanbergs presented a graph comparing several water supply forecasts for the Dworshak basin. A Joint Technical Staff Memo released on January 21 highlighted significant differences this year between the Weather Service and COE official forecasts and asked the COE to exercise caution regarding flood control drafts. The COE is in the process of formally responding to that memo.

The two most commonly used forecasts differ by 362 kaf, a larger spread than usual. The COE principal components water supply forecast for April-July is 117% of average (3,142 kaf), and the Northwest River Forecast Center's regression forecast for the same period is 105% of average (2,780 kaf). While the COE forecast is significantly above the 30 year average, most of the other forecasts are clustered close to the 30 year average. In response to this disparity and resulting concerns, the COE has asked technical experts at the Columbia River Forecast Group to investigate. Kanbergs pointed out that it's still early in the year, and by March the COE and RFC forecasts may be closer.

Tracy Schwartz, COE Walla Walla, pointed out that the Walla Walla standard forecast, a regression methodology the COE has used for the past 20 years, as a back-up forecast, parallels well with the 30 year average.

In January the COE cut off spill at Dworshak and the project is now operating at full powerhouse with a release of about 10.7 kcfs, Kanbergs said. The current STP forecast suggests that the project should be operating at slightly above full powerhouse releases in order to meet the current end of February local flood control target.

Wagner asked how much weight the Southern Oscillation Index has in the COE official forecast, and whether the COE forecast is the only one to incorporate this measure of El Nino/La Nino sea surface trends. Steve Hall, COE Walla Walla, didn't know whether the RFC factors SOI into its official forecast, but it is part of the COE forecast. The higher COE forecast reflects both January

inflows and the SOI. While snow station readings ranged from 90-108% of normal, January inflows were 211% of normal, and the SOI was the largest on record. Present snowpacks are 105% of normal and inflows have dropped to about 87% of normal, Kanbergs said. Hall added that the north fork of the Clearwater had a current snowpack of 102% of normal. There's an ongoing debate over which forecast will give the overall best consistent results. Bill Proctor, COE, said there's a historical correlation between January inflows above 350 kcfs (this year, it was 430 kcfs) and high seasonal runoff. There continues to be a strong signal of La Nina conditions.

Russ Kiefer, Idaho, expressed concern that if this turns out to be a medium-flow year, meeting refill targets could impact the ability to provide spring flow augmentation from Dworshak. He acknowledged that it's a difficult balancing act to manage the project so it meets refill targets and provides augmentation without causing gas problems throughout the Columbia and Snake. Kiefer said he has heard reports of kokanee being entrained in the Dworshak powerhouse, but didn't know the estimated number of fish affected. The COE has just received a report of kokanee being flushed through the powerhouse, Hall said. He will report back to TMT when the COE has had time to investigate this phenomenon.

Tom Lorz, CRITFC/Umatilla, asked two questions: (1) Has the COE considered a flood control swap between Grand Coulee and Dworshak? (2) Is the COE planning to release full powerhouse from the project through all of March? If the weather cooperates, would it be feasible to drop outflows and release additional water in February.

Kanbergs said the COE is considering such a swap, which would take pressure off the end-of-month targets at Dworshak. The COE will be closely examining weather patterns and forecasts early next week. Lorz requested that it be done the end of this week; speed is essential. The COE looks at flows not only in February but March and April, when inflows could be higher than usual, Hall said. High inflows limit drafting capacity, and it's not uncommon to see 8-10 kcfs inflows in April. This could impact the ability to meet end of April flood control targets at Dworshak.

Lorz asked whether it would be a problem if TDG saturation levels went to 112% this spring. High TDG has potentially dramatic impacts on fish at the Dworshak hatchery, which reports a higher incidence of GBT when saturation levels go above 105%, Hall replied. In high water years, sometimes the COE has no choice but to spill above state standards, Kanbergs added. Kiefer said that Idaho would be willing to discuss whether a slight increase in the incidence of GBT would be an acceptable tradeoff for the ability to provide spring flows for migrants. The COE will follow up on Dworshak via an email to TMT members by February 16.

6. Fish Operations Plan Update

February 18 is the tentative release date for the COE to share the draft FOP with regional parties, Doug Baus, COE, reported. TMT will revisit the FOP at its next meeting February 23.

7. Operations Review

a. Reservoirs. Libby is at elevation 2,405.58 feet, with inflows of 2.4 kcfs and releases of 19.6 kcfs. Albeni Falls is at elevation 2,055.7 feet, operating between 2,055-2,056 feet with outflows of 22.6 kcfs. Dworshak is at elevation 1,519.24 feet, with inflows of 4.5 kcfs and releases of 10.7 kcfs.

Lower Granite is discharging 40 kcfs average flows; McNary is discharging 202 kcfs average flows; and Bonneville is discharging 214 kcfs average flows. In the recent days, flows have picked up in response to cooler weather and more load demand and higher outflows from headwater projects to meet flood control targets.

Grand Coulee is at elevation 1,279.1 feet, drafting toward elevation requirements for drum gate maintenance and spring flood control. Hungry Horse is at elevation 3,532.8 feet, releasing 9 kcfs. The water supply forecast is 117% of normal and snowpack is 128% of normal. On February 15, the Hungry Horse generators are scheduled for a black start, which means generation will be shut down for 3-6 hours during the day for tests and releases of about 6.5 kcfs will be made through the jet valves. This could have TDG implications, which BOR and Montana will monitor and have coordinated with state authorities.

b. Fish. There was nothing to report today.

c. Power System. There was nothing to report today.

d. Water Quality. There was nothing to report today.

3. Next Meetings

The next TMT meeting in person will be February 23. Dworshak operations, the spring FOP, and water supply forecasting will be on the agenda.

Name	Affiliation
Karl Kanbergs	COE
Paul Wagner	NOAA
Doug Baus	COE
Steve Hall	COE Walla Walla
Laura Hamilton	COE
Rich Hilt	COE
Tim Heizenrader	Centaurus
Scott English	COE
Ruth Benson	COE
Robert Stansell	COE

Bill Proctor

COE

Phone:

Mike Shapley

Snohomish PUD

John Roache

BOR

Cindy LeFleur

Washington

Scott Bettin

BPA

Bruce McKay

Consultant

Tom Le

Puget Sound Energy

Russ George

WMC

Greg Bowers

COE

Richelle Beck

DRA

Steve Rowe

COE

Russ Kiefer

Idaho

Tom Lorz

CRITFC/Umatilla

Alex Cibarra

Grant PUD

Tracy Schwartz

COE Walla Walla

Summary of Pinniped Predation in the Bonneville Dam Tailrace, 2010

Fisheries Field Unit
USACE Portland
District



Topics Covered

- Results
 - ▶ Pinniped Abundance Estimates, 2010 and trends
 - ▶ Pinniped Predation Estimates, 2010 and trends
 - ▶ Effectiveness of Deterrent Actions, Removal Program
- Task Force Recommendations
- Recent 9th Circuit Court Ruling
- 2011 Pinniped Program (Plans)



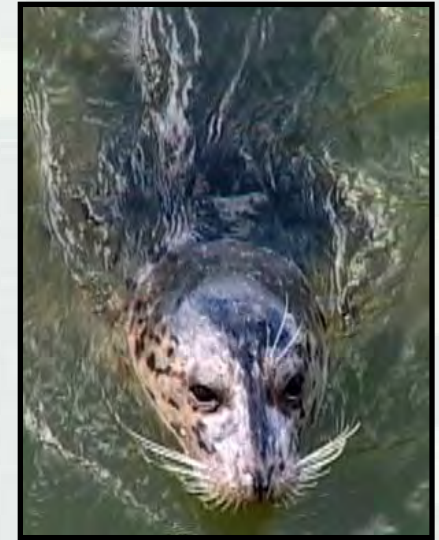
Results:

Pinniped Abundance



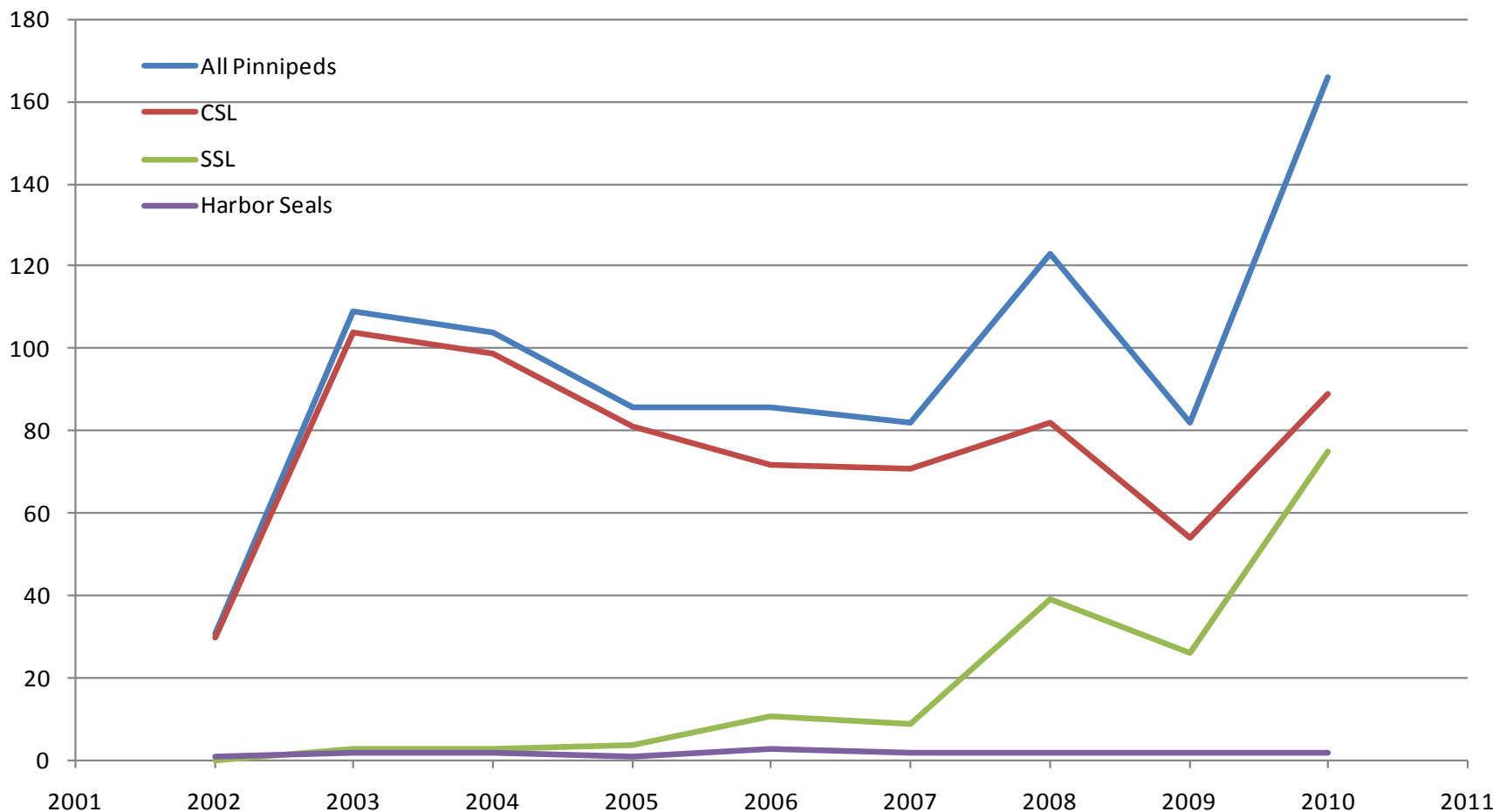
California sea lion
Zalophus californianus

Steller's sea lion
Eumetopias jubatus

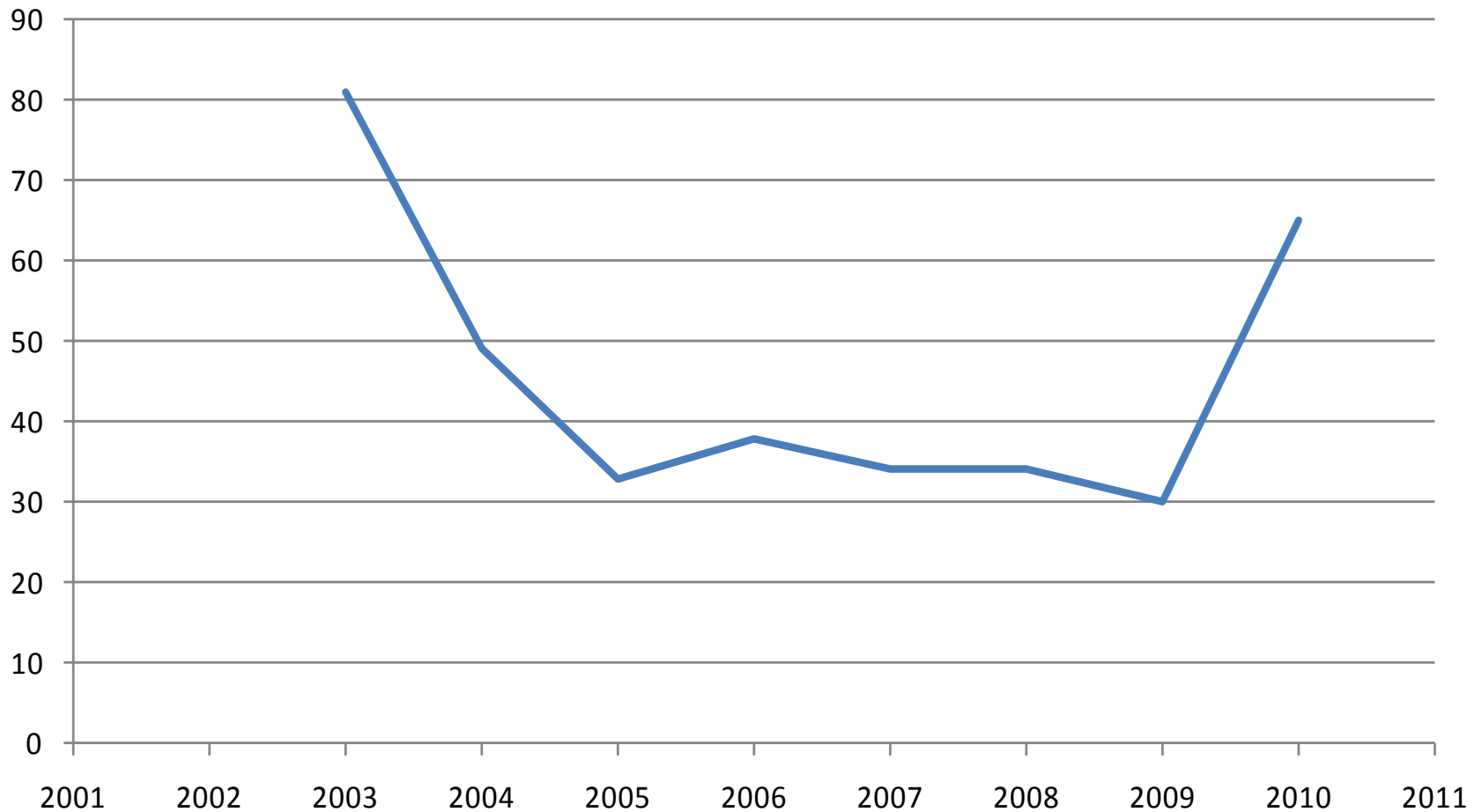


Harbor seal
Phoca vitulina

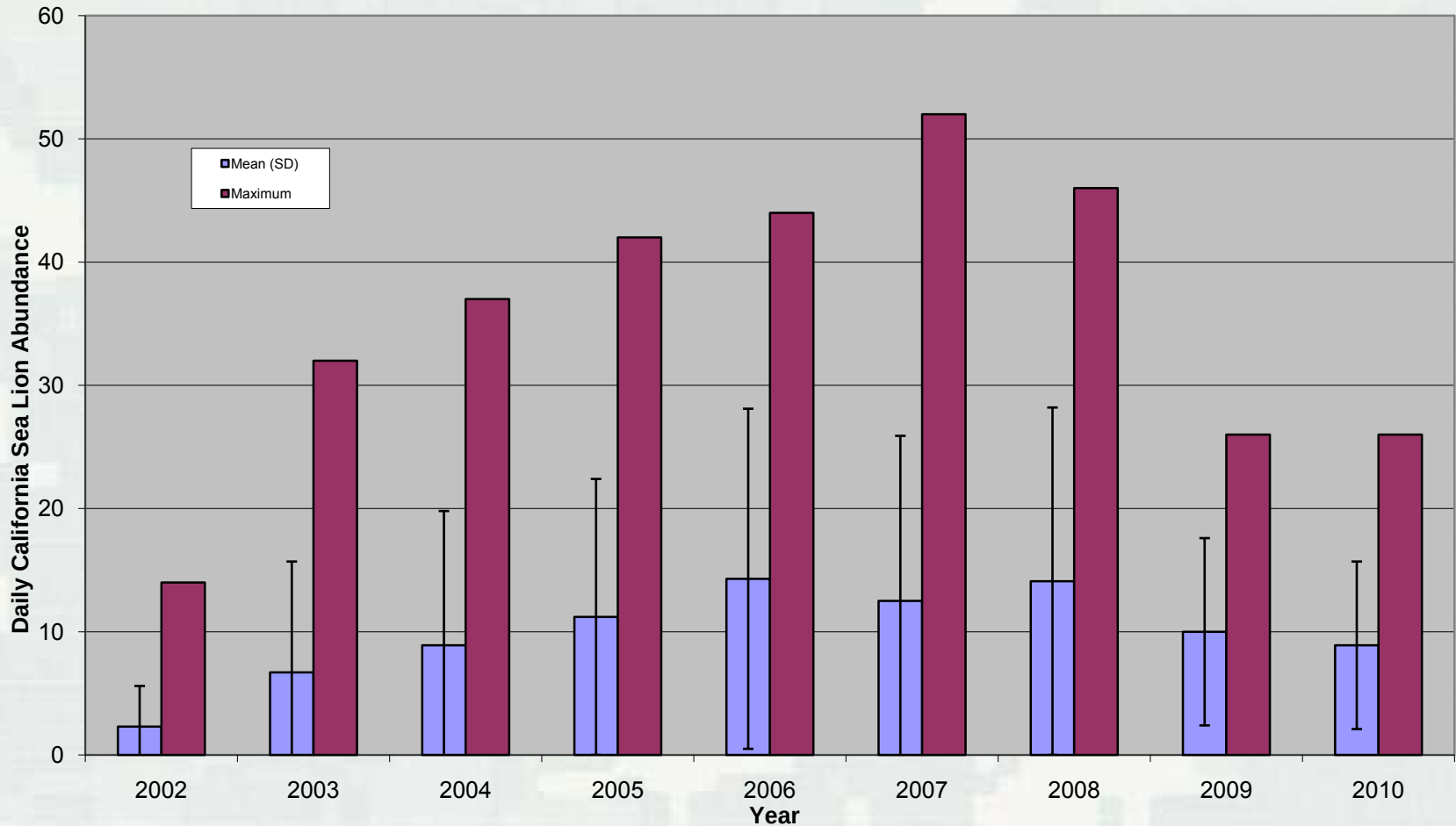
Pinniped Minimum Annual Abundance Estimates for Bonneville Dam



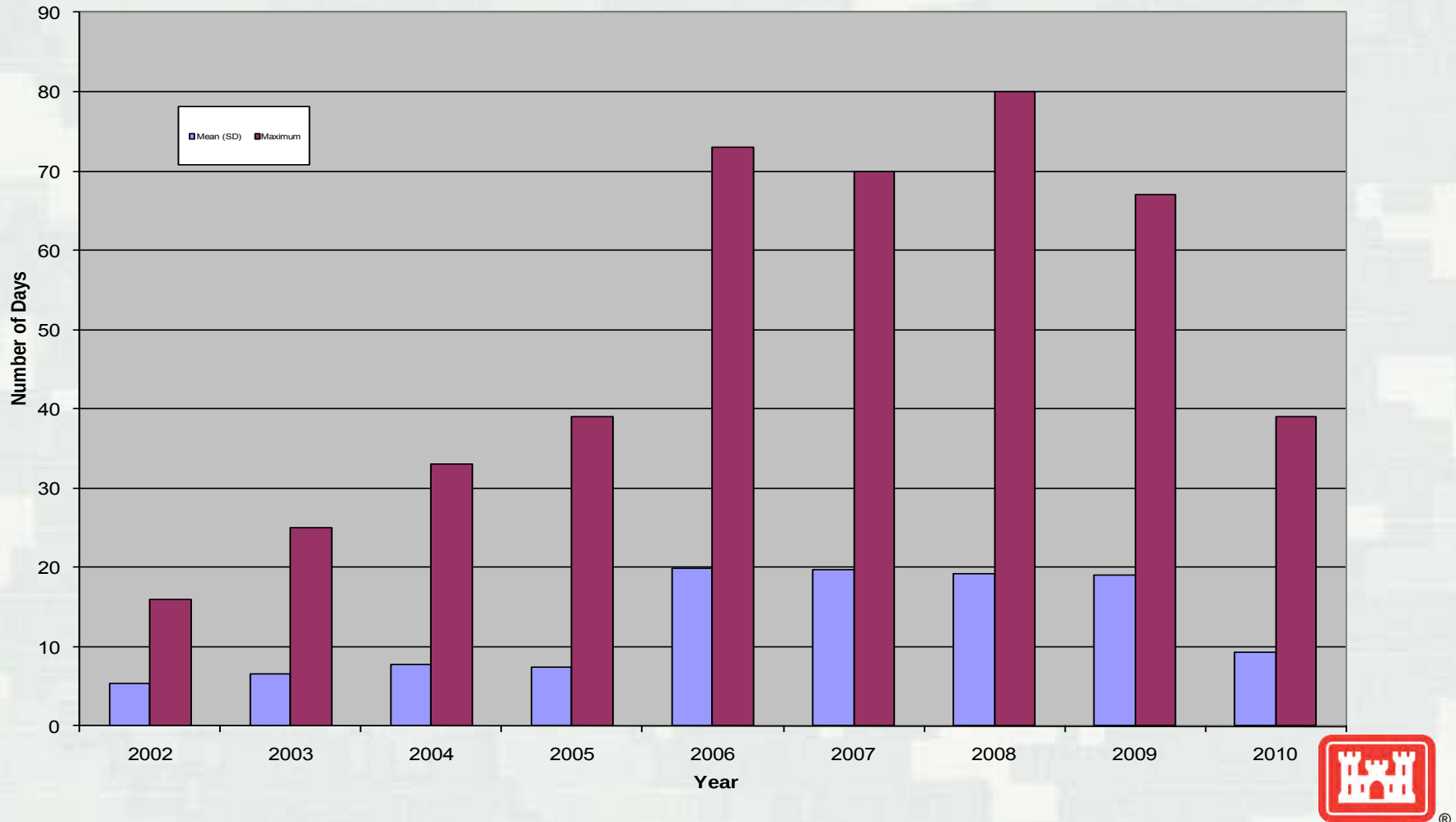
Percentage of CSL Identified as "New Individuals" Each Year at Bonneville Dam



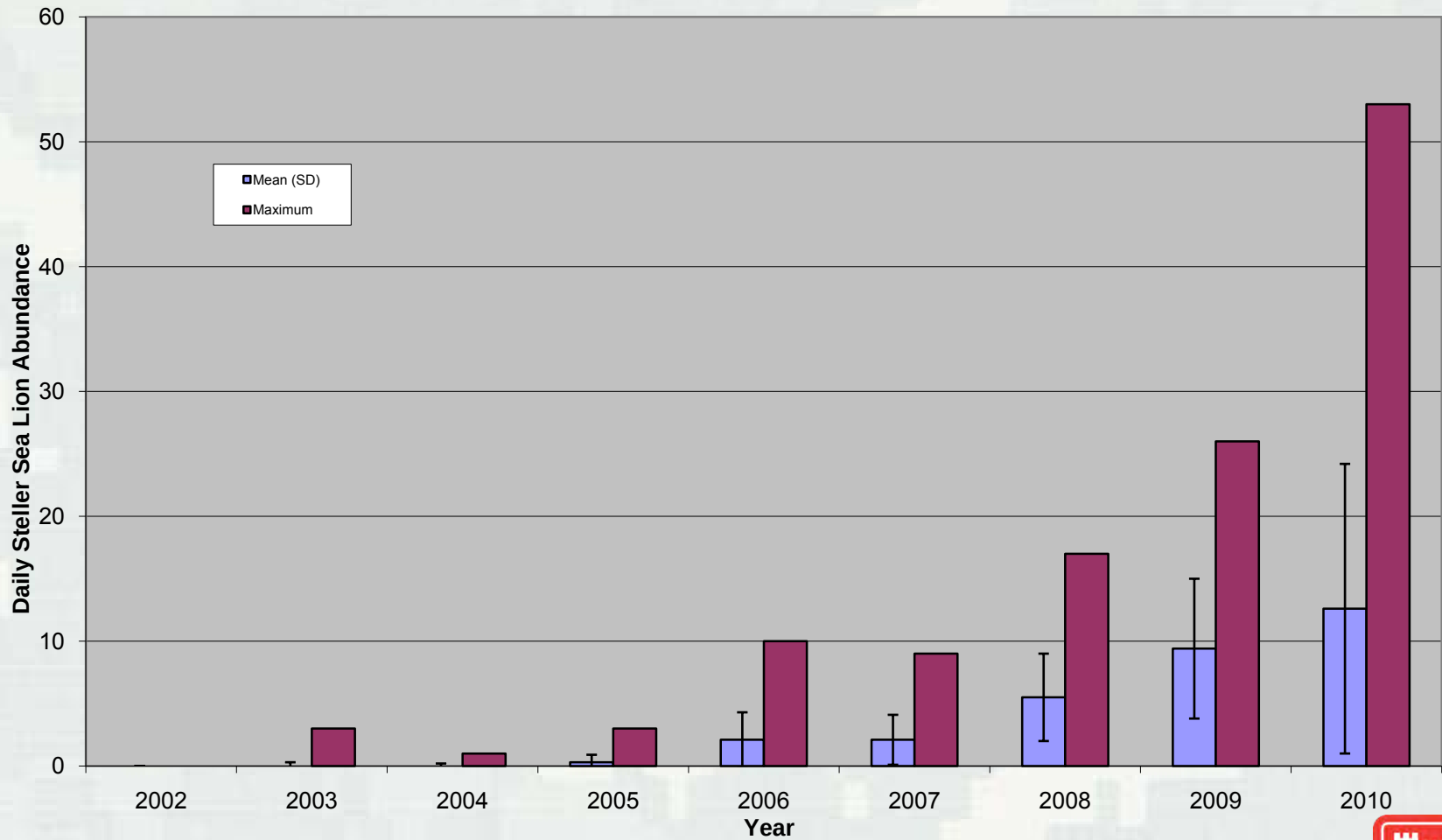
Daily Average and Maximum CSL Abundance, 2002-2010



Average and Maximum Number of Days Seen at Bonneville Dam per CSL



Daily Average and Maximum SSL Abundance, 2002-2010



MARCH 1, 2010, 0630



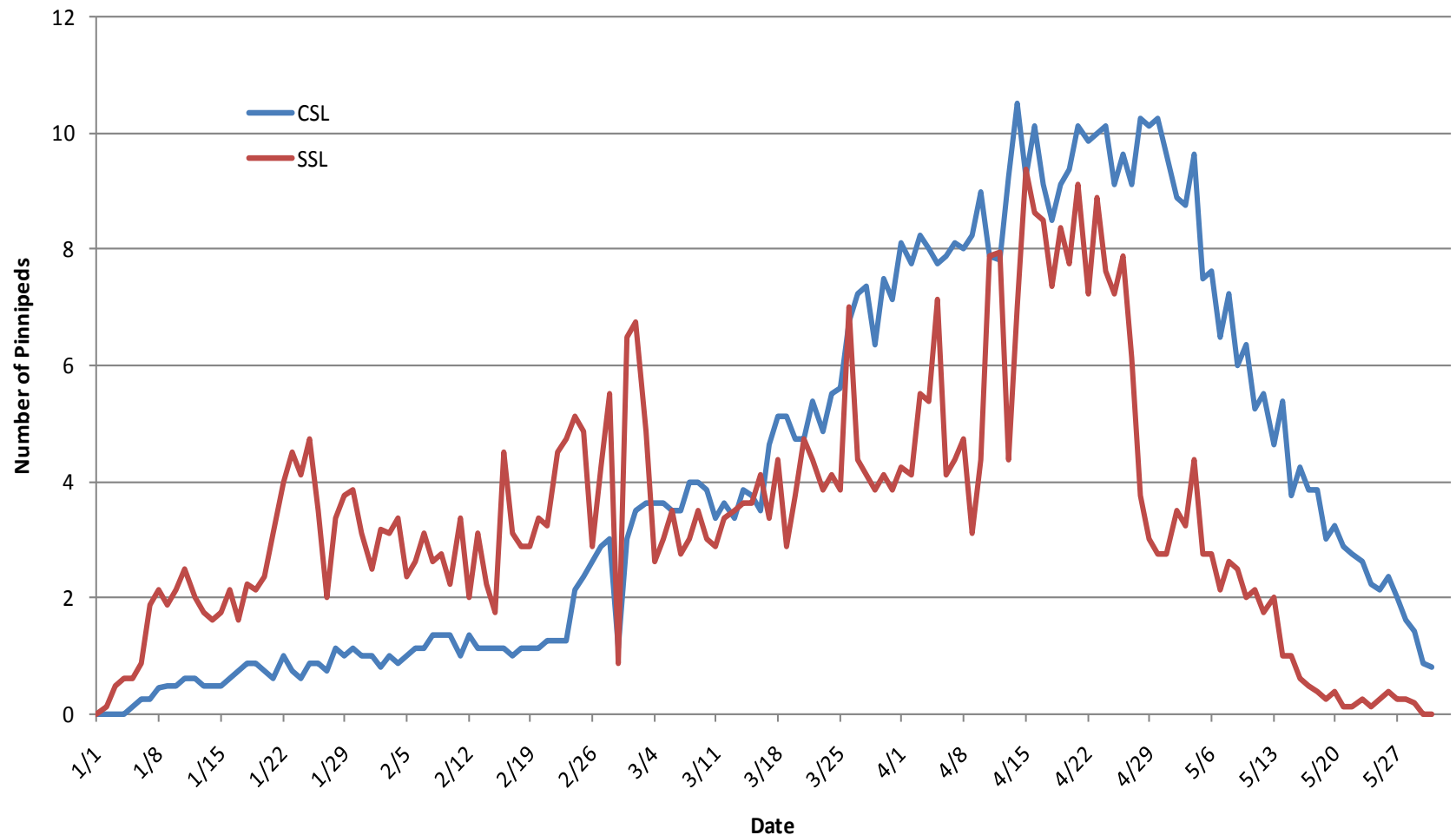
TRAP ONE



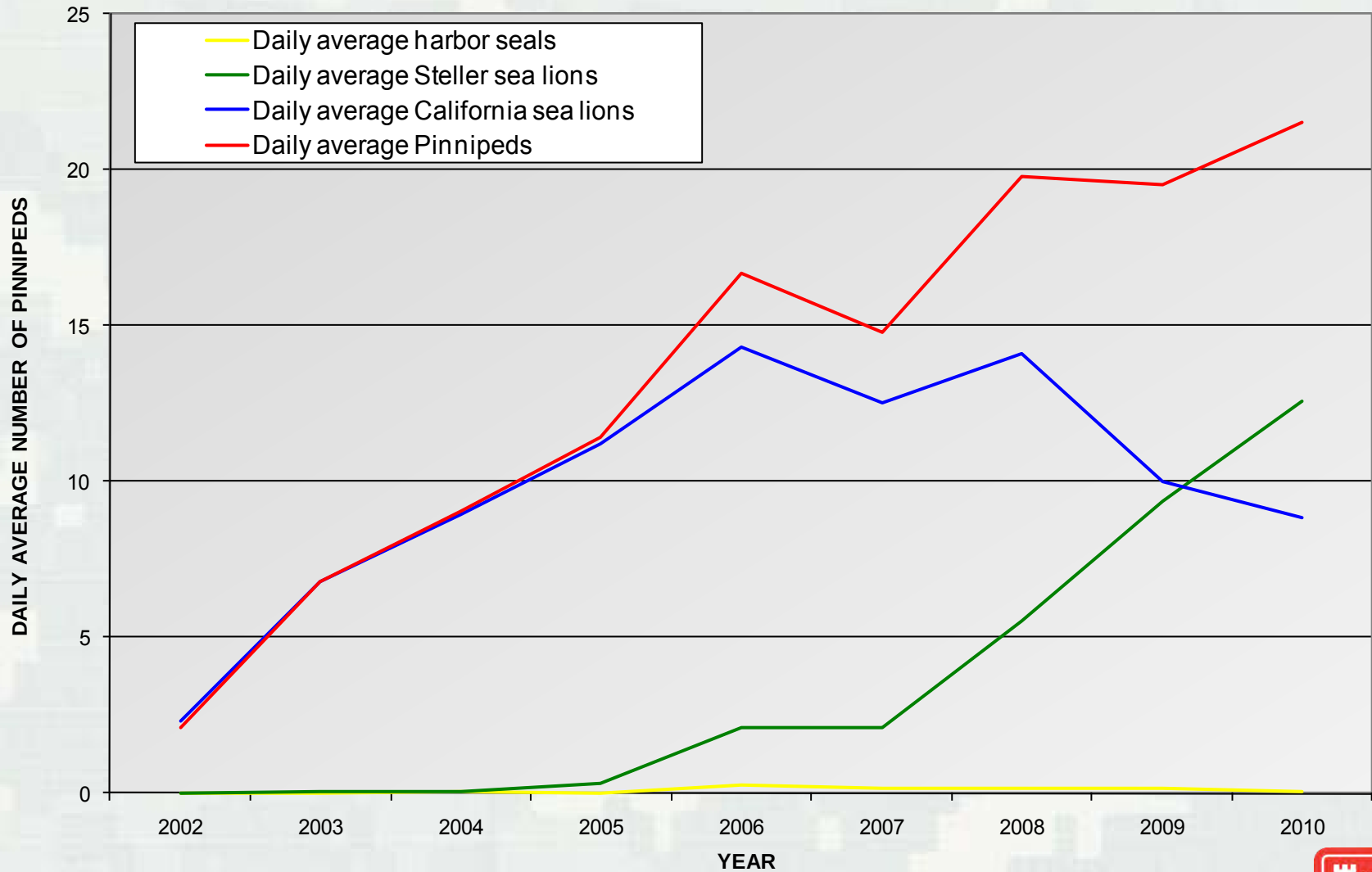
**TRAP THREE
AND FOUR**



Average Daily Number of CSL and SSL Observed in the Bonneville Dam Tailrace, 2008-2010



DAILY AVERAGE OF PINNIPEDS AT BONNEVILLE DAM, 2002-2010



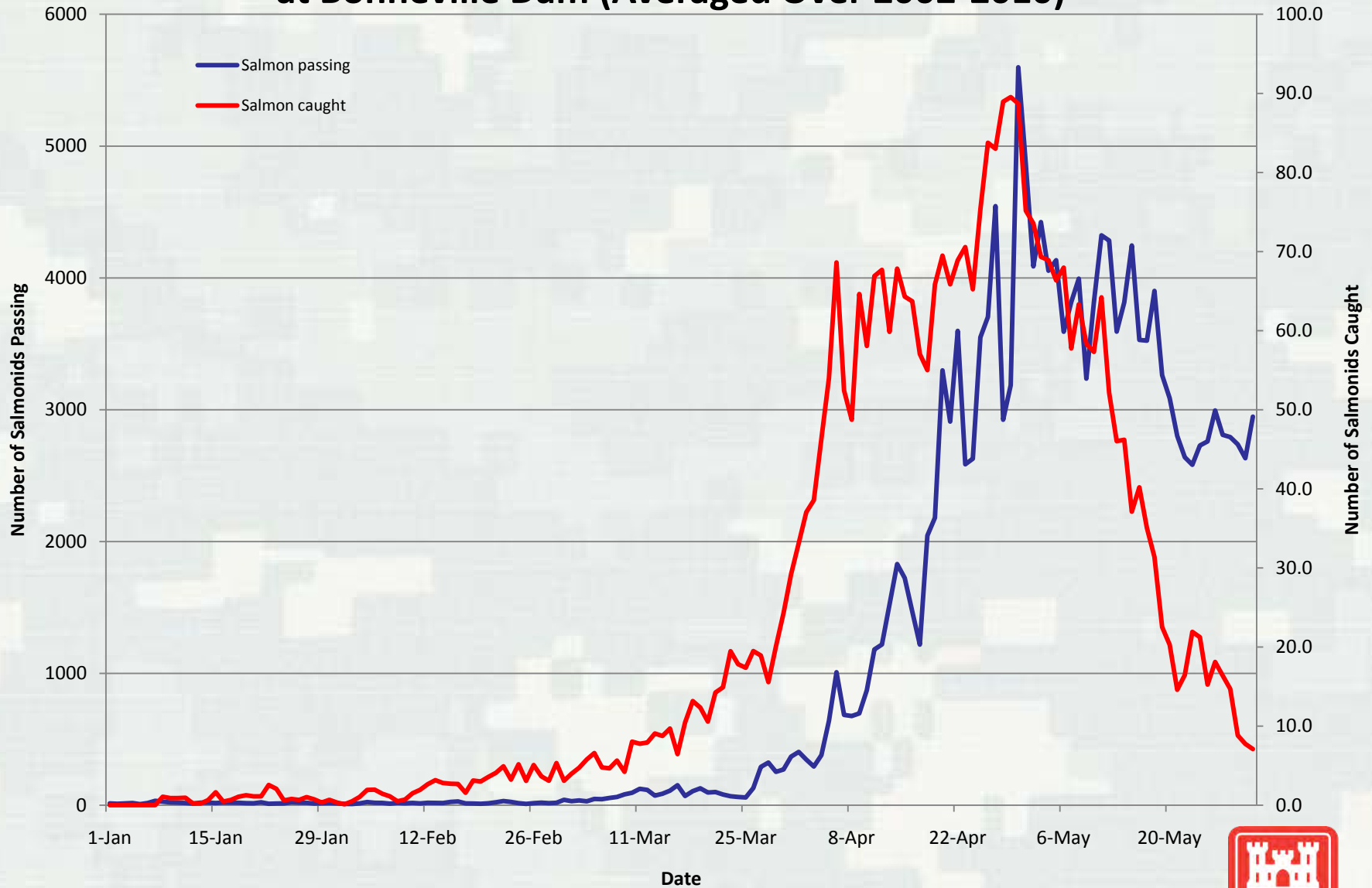
Results: Pinniped Predation



Annual Salmonid Passage and Estimated Consumption by Pinnipeds

Year	Bonneville Dam Salmonid Passage	Expanded Salmonid Estimated Consumption	% of Run (Jan 1-May31)
2002	284,733	1,010	0.4%
2003	217,185	2,329	1.1%
2004	186,804	3,533	1.9%
2005	82,006	2,920	3.4%
2006	105,063	3,023	2.8%
2007	88,474	3,859	4.2%
2008	147,543	4,446	2.9%
2009	186,060	4,489	2.4%
2010	267,194	6,081	2.2 %

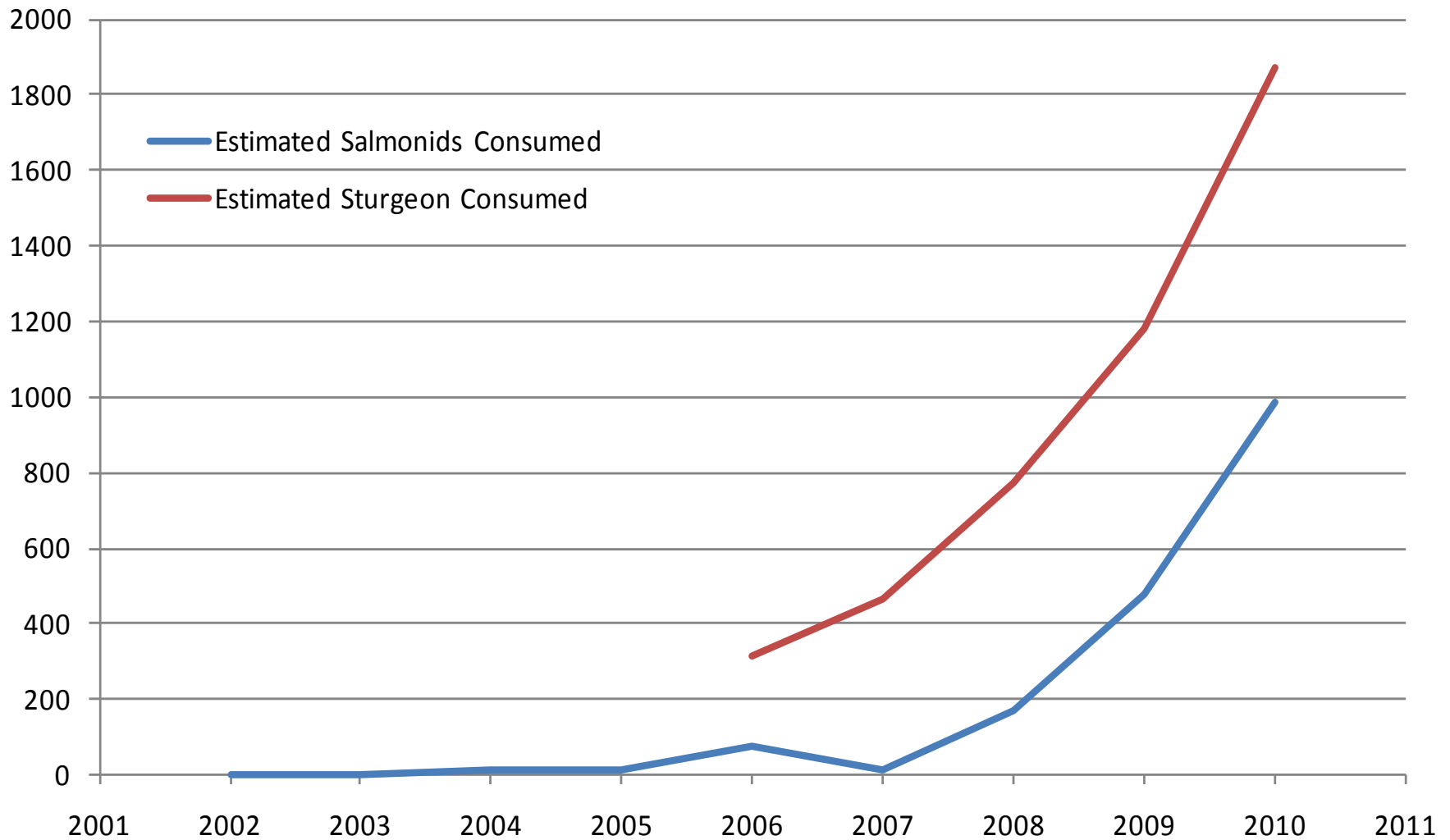
Timing of Salmonid Predation by Pinnipeds and Salmon Passage at Bonneville Dam (Averaged Over 2002-2010)



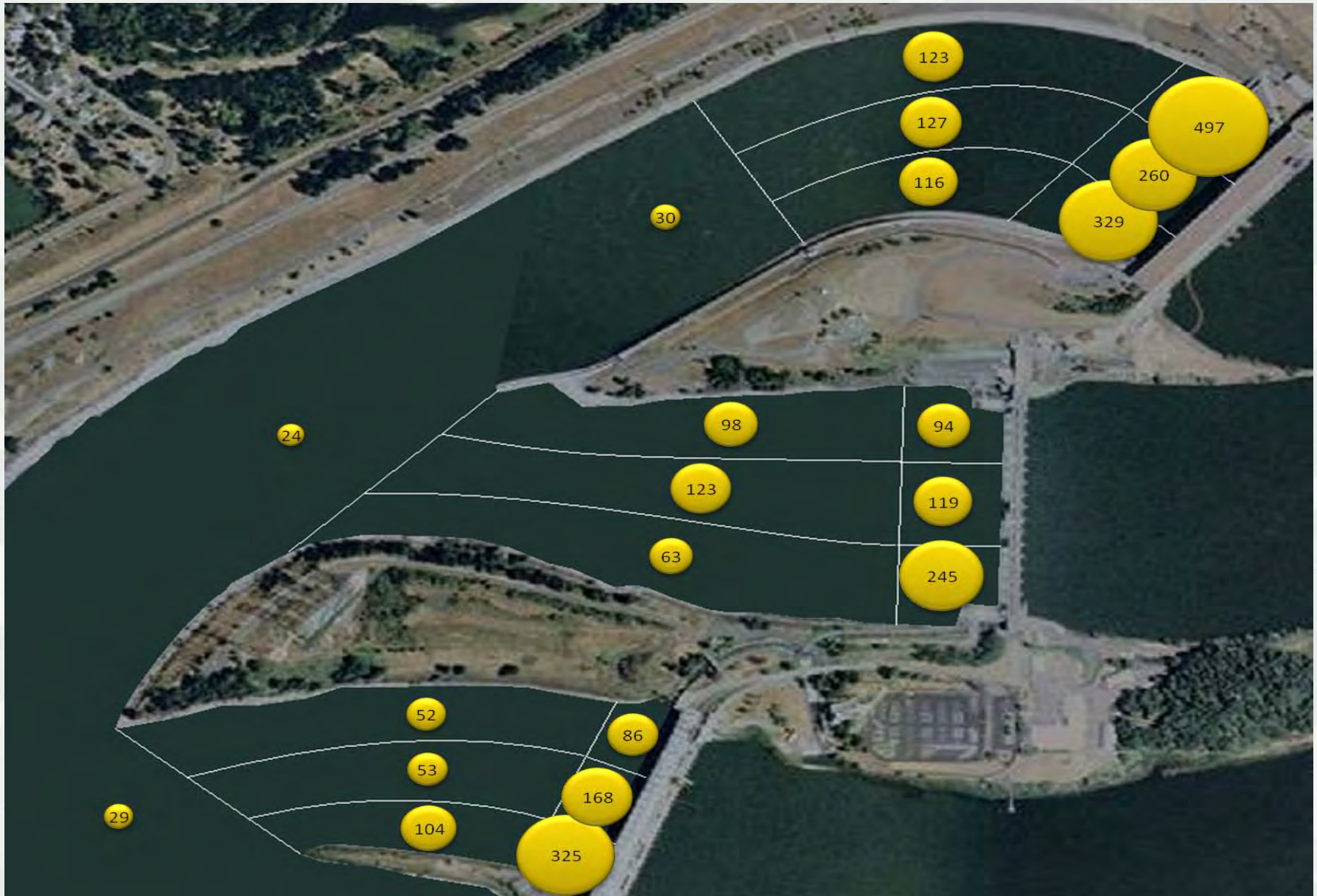
Expanded Estimated of Salmonids Consumed by Pinnipeds at Bonneville Dam, Adjusted for Unknown Catch, Night-time Catch, and Clepto-parasitism Events, 2002-2010



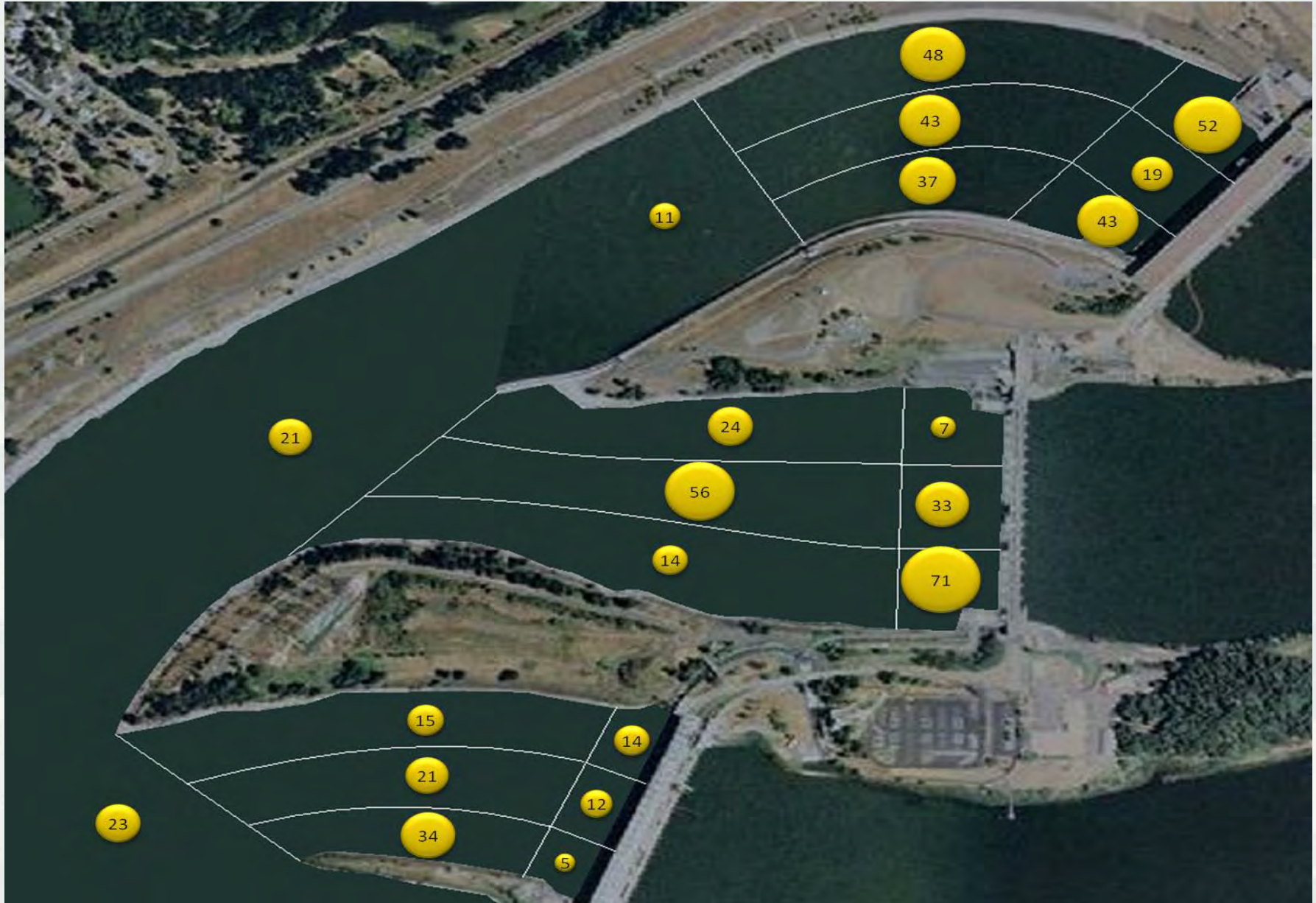
SSL Estimated Salmonid and Sturgeon Predation



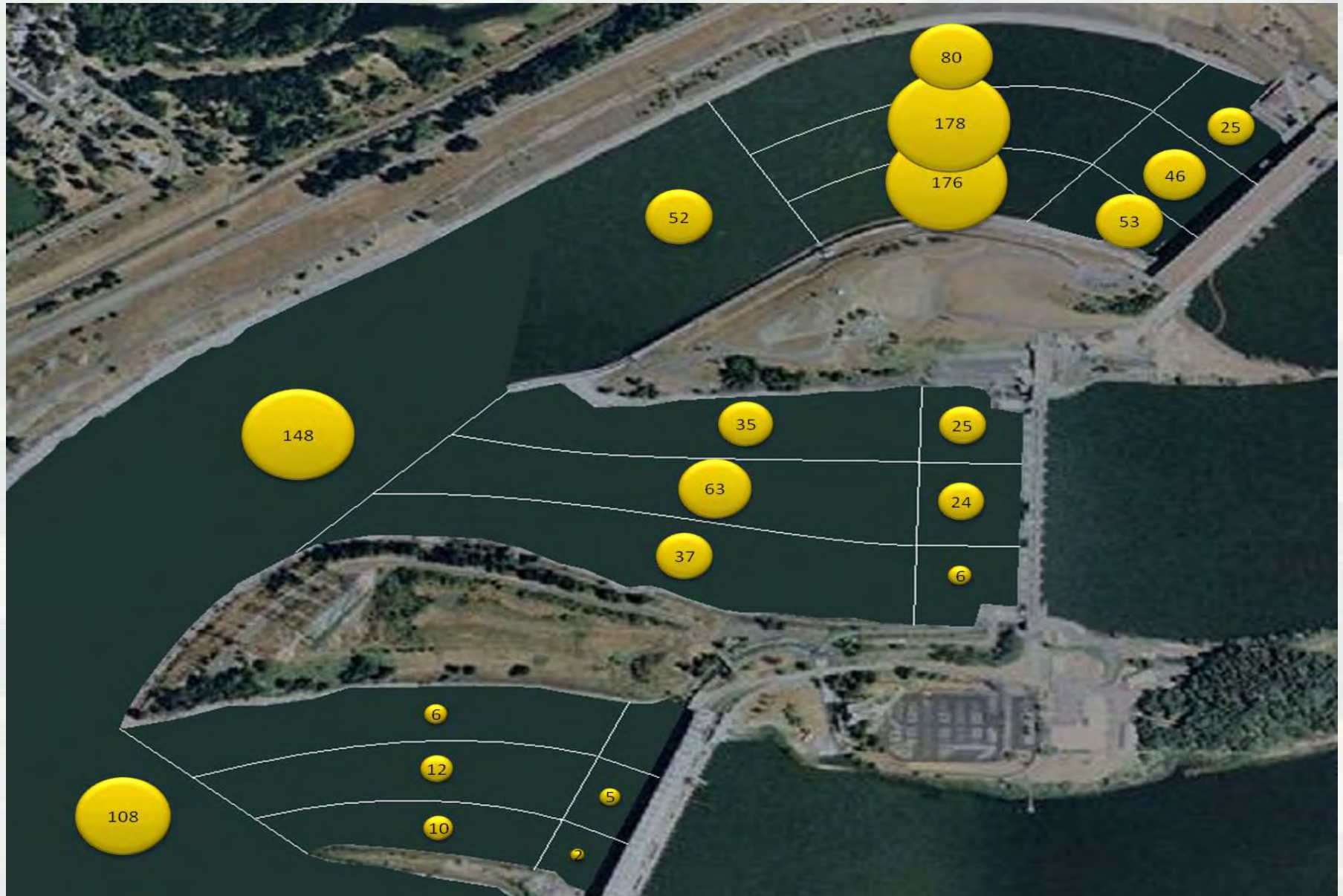
Chinook Catch by Location, CSL 2010



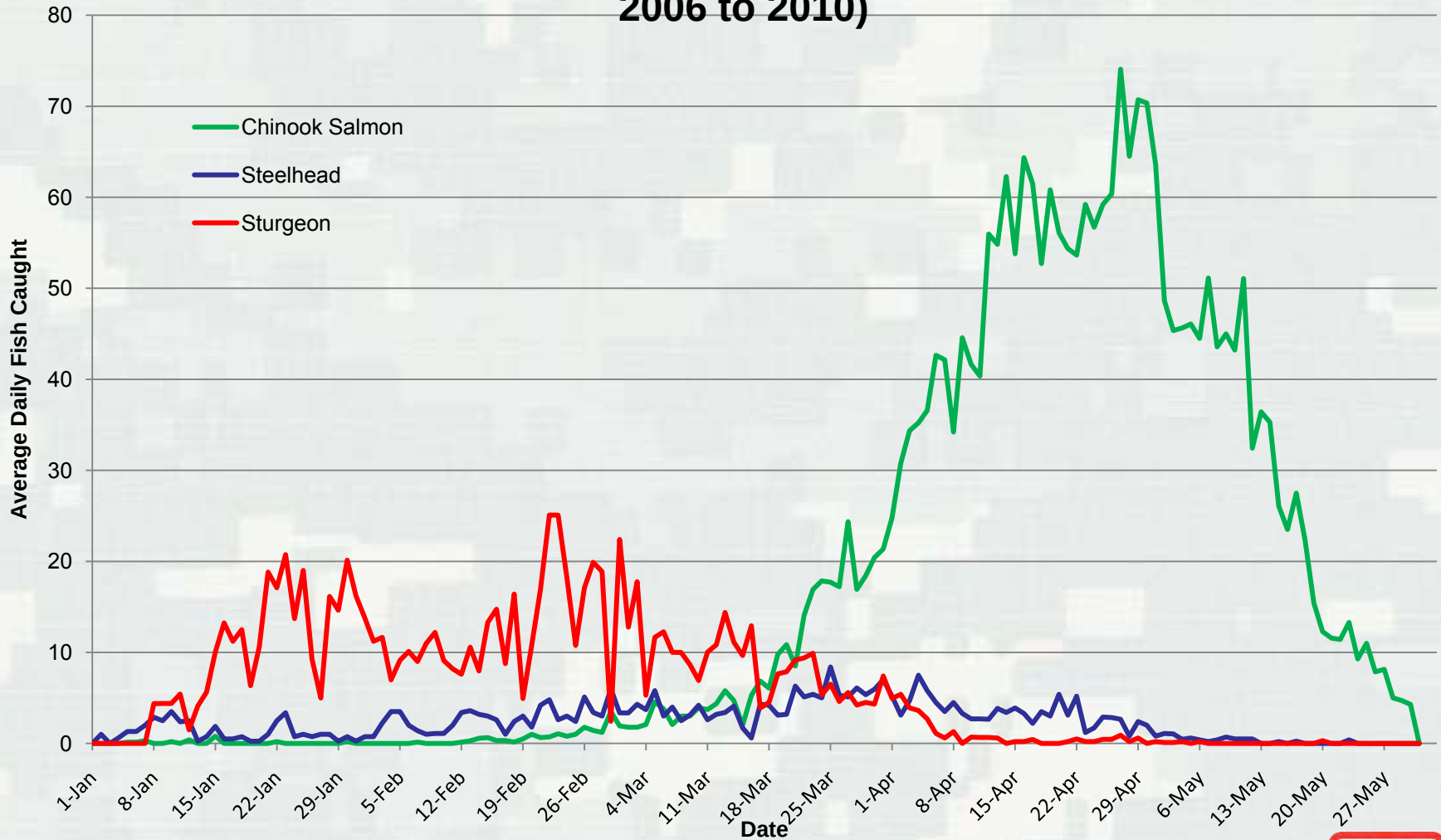
Chinook Catch by Location, SSL 2010



Sturgeon Catch by Location, SSL 2010



Daily Average Estimated Chinook Salmon, Steelhead, and Sturgeon Caught by Pinnipeds at Bonneville Dam (Averaged 2006 to 2010)



Lamprey Predation at Bonneville Dam Tailrace, 2002-2010

Year	Expanded Pacific Lamprey Consumption Estimate	Percent of Total Observed Fish Catch
2002	47	5.6%
2003	317	11.3%
2004	816	12.8%
2005	810	25.1%
2006	424	9.8%
2007	143	2.6%
2008	145	2.0%
2009	102	1.4%
2010	39	0.7%



Results: Non-Lethal Deterrents



Deterrent Measures at Bonneville Dam, 2008-2010

- SLED's and FOG's installed and still effective (No entry into fishways observed after installed).
- Acoustic Deterrent Devices installed near entrances and activated, no effect noticed.
- Hazing by USDA (land) and States/CRITFC (boat) continued, limited effectiveness.
- Concrete blocks appear successful in preventing hauling out on concrete apron, but not resting nearby.



Results: Trapping and Removal



California Sea Lion Removals Columbia River, 2008-2010

Year	Zoo/Aquaria	Accidental Trapping Incident	Euthanized	Trapped in Astoria and Euthanized	Total
2008	6	4	1	0	11
2009	4	0	10	1	15
2010	0	0	12	2	14
Total	10	4	23	3	40



Comparison of Listed and Non-Listed CSL

	Number of CSL	Mean Number of Salmon Eaten per Individual	Mean Number of Days Observed per Individual
CSL ID'D	420	22.1	22.1
CSL on Removal List	115	65.7	64.3
CSL Not on List	305	5.7	6.2
CSL Removed (excludes 3 non-listed CSL died on 5/4/08)	37	91.0	101.5
CSL Remaining on List	78	53.7	46.6

Note – Data as of 10/20/10, using observed data only, not expanded.



MAY 2008 ~ Astoria, OR

Bonneville residents

Astoria residents

Pinniped/Fishery Interaction Task Force Review of Removal Program (3rd Year)

- Met 4 days in November to review COE and States results
- Past 3 years of removal program showed mixed results, first a drop then an increase in abundance and predation
- Task Force assigned to recommend changes/improvements to the program, or to end it
- Report came out December 12



Pinniped/Fishery Interaction Task Force Recommendations (Majority)

- Reduce requirements for CSL to qualify for removal, remove mandatory hazing efforts
- Increase trapping effort: increase number of traps and days actively trapping and limit haul out sites
- Implement shooting as a tool to remove more CSL each year
- Explore new/easier ways to mark more individuals (shoot streamer tags, paintballs, etc)



Pinniped/Fishery Interaction Task Force: Requirements for Removal of Pinnipeds

- Old Requirements
 - ▶ Individually identifiable
 - ▶ Seen at Bonneville for 5 days and,
 - ▶ Seen to take at least one salmonid and,
 - ▶ Present during non-lethal hazing conditions
- New Requirements
 - ▶ Individually identifiable
 - ▶ Seen to take one salmonid and/or present for 5 days and/or seen multiple years

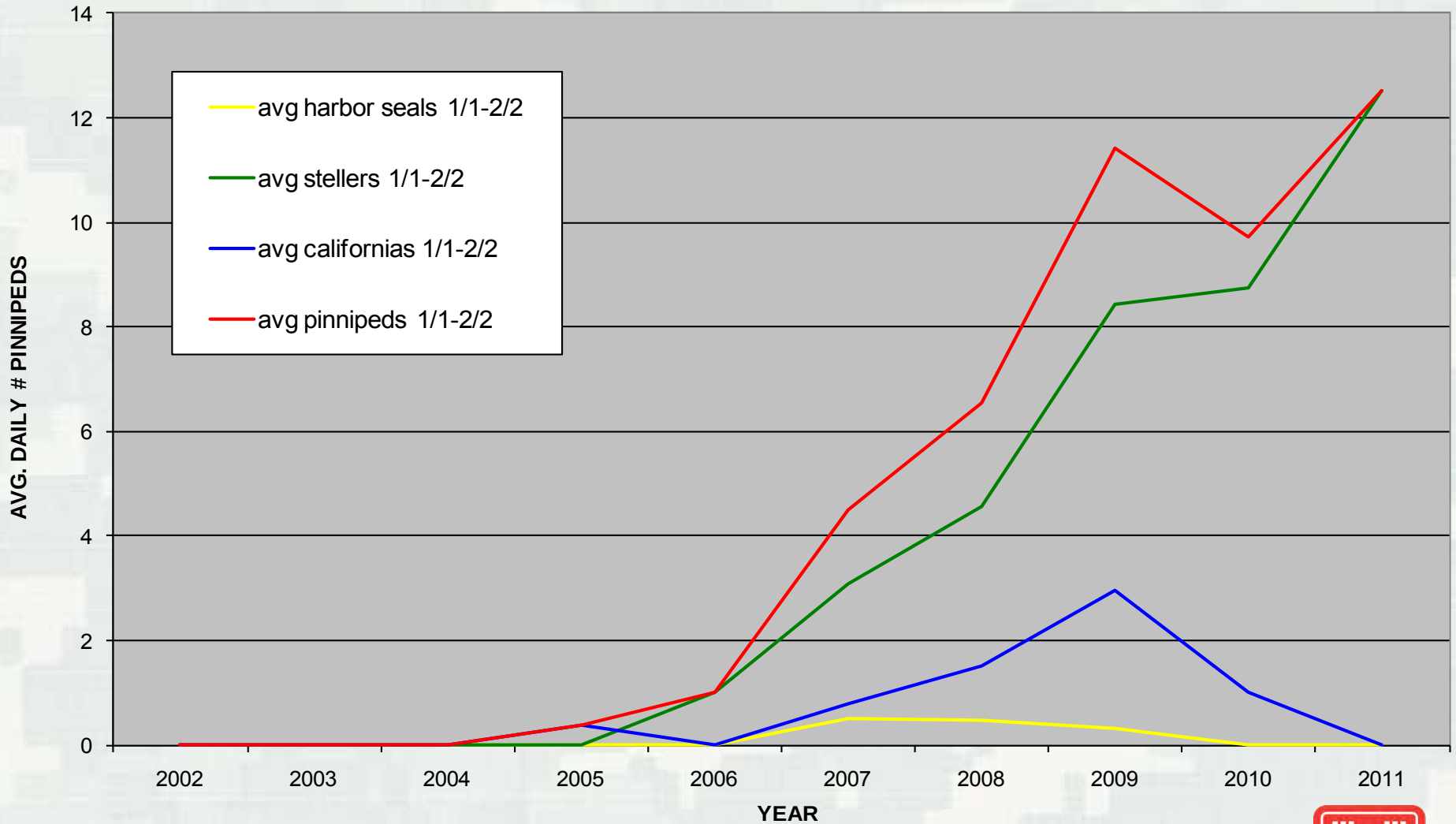


9th Circuit Court of Appeals

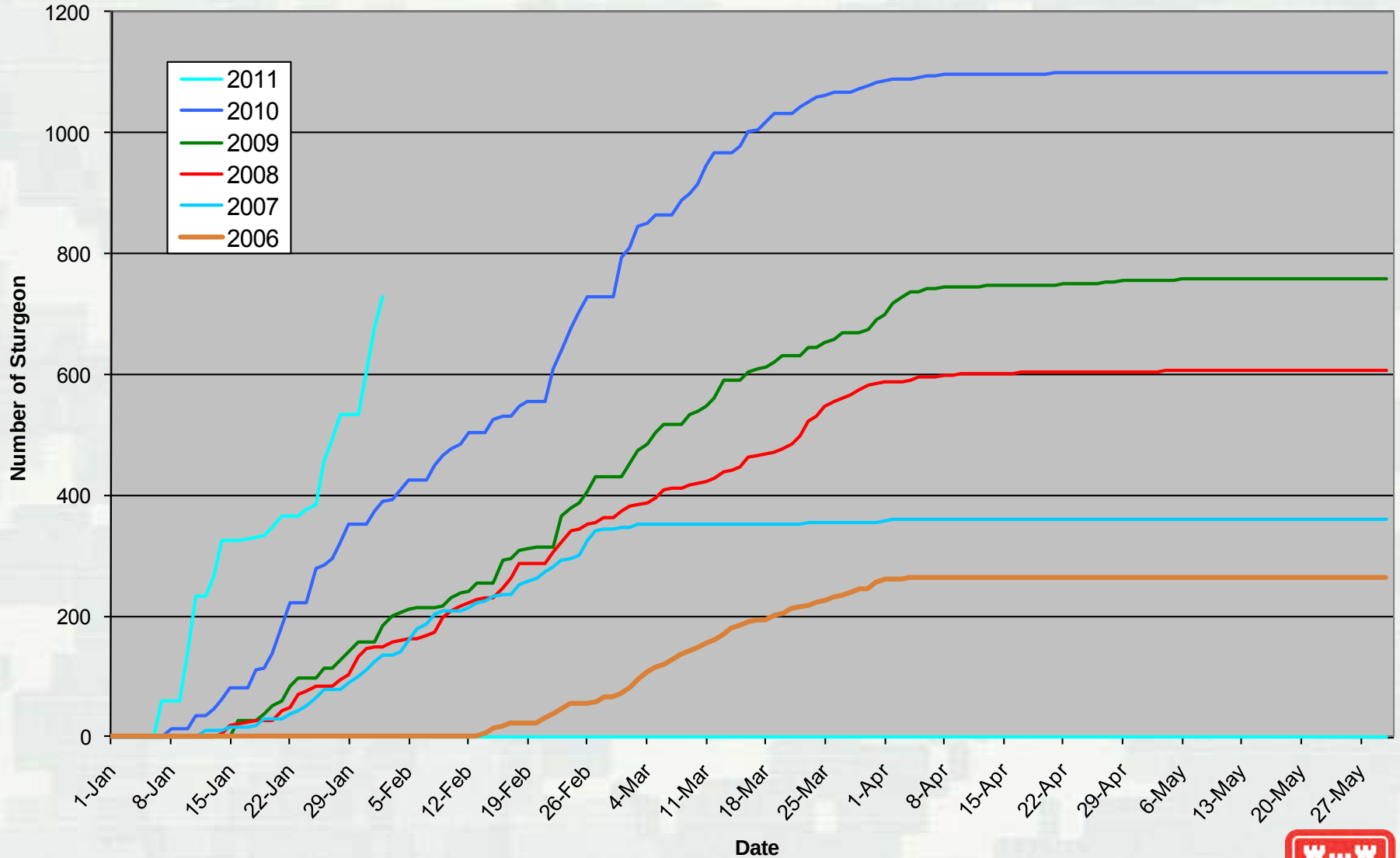
- November 23, 2010 court ruled that NOAA had not sufficiently explained that California sea lion predation at Bonneville was “significant”, in light of comparisons to human harvest levels allowed.
- NOAA has accepted courts ruling, plans on addressing those concerns and formulating a new Pinniped program by March 2011.



**AVERAGE DAILY PRESENCE OF PINNIPEDS, BY SPECIES, AT BONNEVILLE DAM,
FOR JAN 1 TO FEB 2 EACH YEAR**

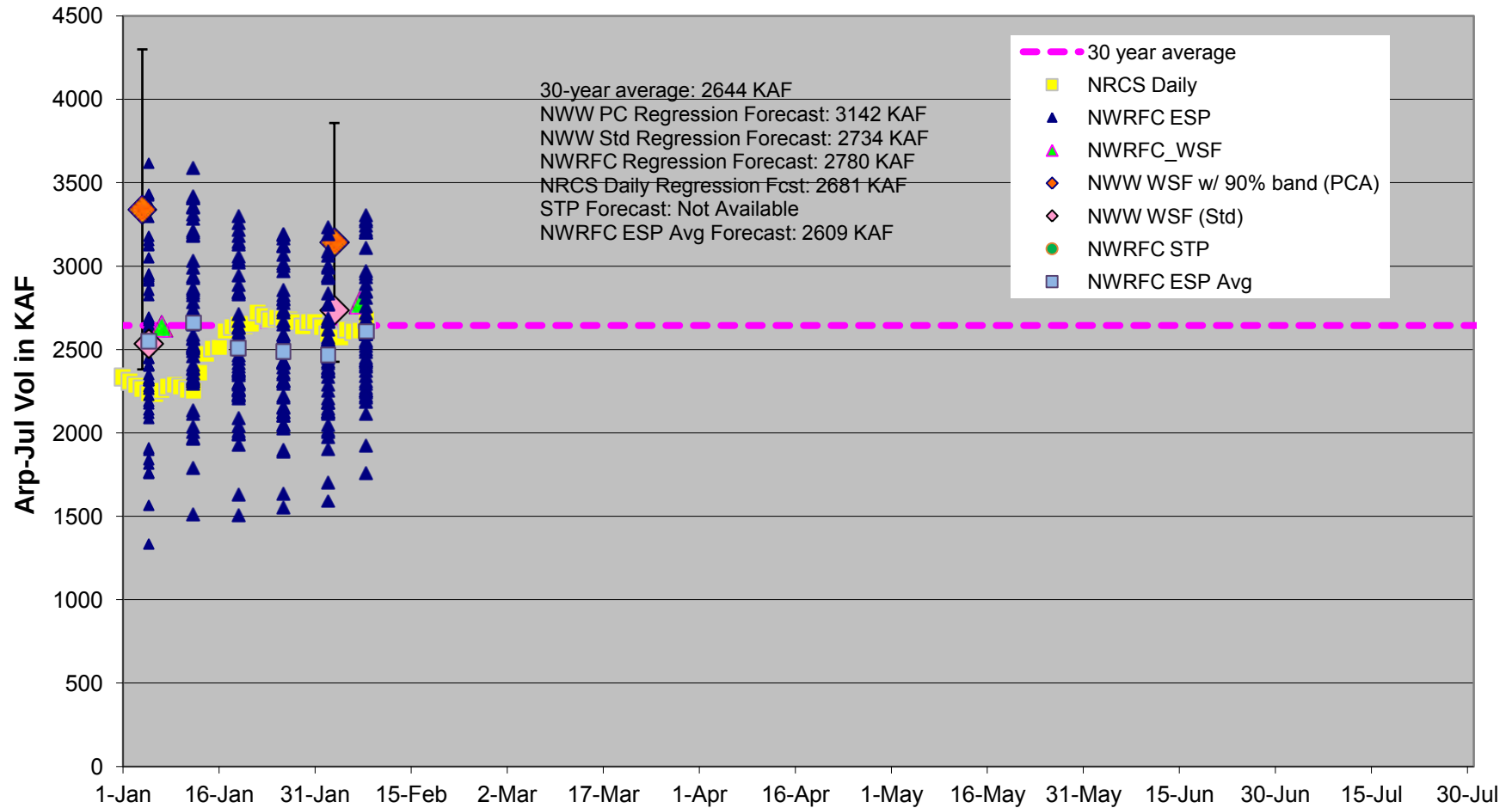


Cumulative Observed Daily Sturgeon Catch at Bonneville Dam, 2006-2011



Dworshak, ID April-July Inflow Volume Forecast Comparison

updated 08-Feb-2011



TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
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WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday February 23, 2011 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274
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*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review February 9 Meeting Minutes [\[Meeting Minutes\]](#)
3. Vernita Bar Update- Russell Langshaw, Grant County PUD
 - a. [PRD Tailrace Temperatures and HRF CPP Constraints](#)
4. 2011 Spring Operations - Dan Feil, COE-NWD
 - a. [Draft Spring FOP](#)
 - b. [Draft John Day White Paper](#)
5. Water Supply Forecast Update- Steve King, NWRFC
 - a. [Power Point Overview](#)
6. Dworshak Update - Steve Barton, COE-RCC and Steve Hall, COE-NWW
7. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System

- d. Water Quality
- 8. Other
 - a. Set agenda and date for next meeting - **March 9, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

Draft John Day Dam Fish Passage Project Operation

February 22, 2011

Introduction

The NOAA 2010 Supplemental Biological Opinion¹ (BiOp) established juvenile dam passage survival standards of 96% for spring migrants and 93% for summer migrants. Dam passage survival is defined as survival from the upstream face of the dam to a standardized reference point in the tailrace. To demonstrate achievement of the performance standard, survival must be estimated to a precision level of $\pm 3\%$ at the 95 percent confidence level using a paired-release methodology to estimate survival relative to a reference group.

Since 2008, John Day Dam has operated under a base operation of 30% spill, while evaluation of two alternating spill operations, 30 and 40% spill has occurred during the spring and summer. In each of the past three years, the Corps' Portland District has funded research to evaluate dam passage survival for migrating juvenile salmonids under these two spill operations. The research conducted during these three years provides information useful in determining if either of these two spill operations may be candidate under the current project configuration for meeting the juvenile dam passage survival performance standards specified in the BiOp. The purpose of this paper is to summarize the information collected to date in order to help make a determination on an operation to test in 2011 for achieving the performance standards for both spring and summer juvenile migrants.

Background

The John Day Configuration and Operation Plan (COP) identified alternatives that had potential to increase passage survival for migrating juvenile salmonids. Alternatives that showed the highest probability of success included installation of a surface-flow passage route coupled with improvements to the tailrace that would expedite fish egress rates following passage. In addition, varying spillway operational scenarios were considered. In 2008, spillway weirs were installed at bays 15 and 16 to provide a surface flow passage route and to reduce passage through the powerhouse. In 2010, an extended-length flow deflector was installed in spillbay 20 allowing relocation of the spillway weirs closer to the powerhouse (spillbays 18 and 19) by providing adequate training spill that improves tailrace egress. In addition, an avian deterrent array was installed to cover the majority of the project's downstream boat restricted zone.

A post-construction evaluation was conducted at John Day to evaluate the efficacy of each configuration change. In each year, a two treatment test of 30 vs. 40% spill was conducted. These operations were selected because they each provide good egress conditions downstream of the project at spill levels that were achievable given total dissolved gas (TDG) limitations. Acoustic-tagged fish were released upstream near Arlington, Oregon and monitored as they passed the dam (Weiland et al, 2009, 2011, In Prep). Fish passage metrics used to compare spill treatments included spill passage efficiency

¹ The 2010 Supplemental Biological Opinion incorporates the 2008 Biological Opinion.

(SPE)², fish passage efficiency (FPE)³, forebay residence time, tailrace egress time, and absolute survival from passage at John Day to The Dalles Dam forebay (survival).

Research Results

John Day Discharge – Average daily river flow at John Day Dam during the spring outmigration varied among the three years of study in total volume and timing (Figure 1). Average daily river flow levels and timing during the summer study periods were similar for 2008 and 2010, with levels being slightly lower for 2009 during the early summer.

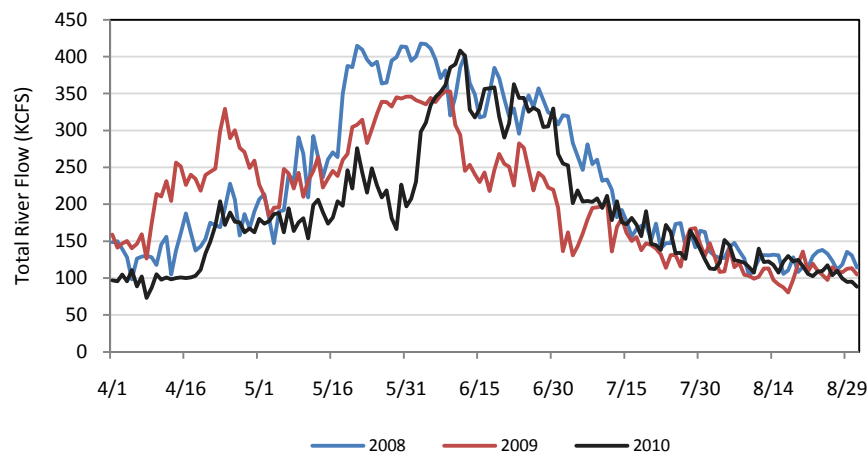


Figure 1.— Average daily flow at John Day Dam, 2008-2010

Survival Model Description – All estimates of juvenile dam passage survival presented below were derived using the single-release survival model⁴. The single-release model is often used to estimate survival through longer or multiple reaches and incorporates all potential sources of mortality incurred through the reach of interest (e.g. direct mortality from dam passage and predation and/or effects from tagging/handling that may occur well downstream of the dam) into the survival estimate. Thus, the single-release survival estimates presented here include mortality from dam passage at John Day Dam *and* mortality through the entire reservoir reach downstream to the forebay of The Dalles Dam. Alternatively, the paired-release model is used to assess survival through a much shorter reach; in this case, from John Day Dam to a reference point downstream only a few kilometers. The paired release model is useful in isolating the immediate effects of dam passage and excludes mortality incurred throughout the entire downstream reservoir due to predation or other sources not specifically linked to dam passage.

The studies conducted at John Day Dam to assess dam passage survival in 2008-10 were not intended to assess survival relative to the juvenile dam passage survival performance standards

² Proportion of fish passing the dam through the spillway

³ Proportion of fish passing the dam through non-turbine passage routes

⁴ A paired-release survival study was conducted in 2008, however for comparison with 2009 and 2010 information, only single-release survival estimates are presented here

specified in the BiOp. Instead, the studies conducted were intended to evaluate survival under two alternative spill operations (30 vs. 40%) to help identify a single spill operation under the current project configuration with the potential to meet the performance standards for juvenile dam passage survival stated in the BiOp. As specified in the BiOp, the paired-release model described above will be used to assess juvenile dam passage survival relative to the performance standards. Full performance standard testing is currently scheduled to occur in 2011 at John Day Dam.

Yearling Chinook Salmon – Across all three years of study, survival estimates for yearling Chinook salmon from passage at John Day to The Dalles Dam forebay exceeded 92% (Table 1) under both 30 and 40% spill levels. Estimates of FPE, since installation of the spillway weirs, exceeded 90% across all three years of study and were highest under the most recent project configuration evaluated in 2010. Compared to studies conducted prior to the installation of the spillway weirs (Beeman et al, 2006), FPE has increased from roughly 83% in 2002 to over 95% in 2010. Estimates of SPE have also increased from roughly 57% in 2002 to nearly 90% in 2010.

Table 1.— Passage behavior and survival metrics used to evaluate 30 and 40% spill at John Day Dam for acoustic-tagged yearling Chinook salmon, 2008-10. Survival (SE) and passage behavior metrics are reported as percents (%) and residence/egress time in hours (h) is reported as a median. All survival estimates are single-release and account for mortality from John Day Dam to The Dalles Dam.

Metric ^A	2008		2009		2010 ^B	
	30% Spill	40% Spill	30% Spill	40% Spill	30% Spill	40% Spill
Passage Survival (%) (John Day to The Dalles forebay)	94.0 (0.5)	94.2 (0.8)	94.3 (0.9)	92.5 (0.5)	94.4 (0.8)	95.0 (0.9)
Spill Passage Efficiency (%)	75.9	76.8	75.9	85.4	91.7	88.0
Fish Passage Efficiency (%)	92.9	91.1	92.6	94.3	96.9	95.9
Forebay Residence Time (h)	2.2	2.2	3.1	2.8	2.4	1.9
Tailrace Egress Time (h)	1.4	1.5	0.5	0.5	0.7	0.7

A – For yearling Chinook salmon, the Accords “no-backsliding” SPE metric range is 45 -75 and the delay metric range is 0.2 – 8.5 hours

B – Results from 2010 are preliminary and subject to change pending final analysis and reporting

Juvenile Steelhead – Estimated survival from passage at John Day Dam to The Dalles Dam forebay across all three years of study and for both treatments exceeded 94% (Table 2). Relocating the spillway weirs to spillbays 18 and 19 in 2010 resulted in an overall increase in SPE under both spill operations compared to 2008-09. Estimates of FPE remained high, equating to a reduction in turbine passage of more than 70% over 2002 radio-telemetry study results (Beeman et al, 2006). Similar to yearling Chinook, estimates of SPE for steelhead have increased from roughly 54% in 2002 to over 87% in 2010. Forebay residence times for juvenile steelhead held mostly steady over the three years of study. Tailrace egress times were much lower in 2010 than in 2008, but slightly higher than in 2009.

Table 2.— Passage behavior and survival metrics used to evaluate 30 and 40% spill at John Day Dam for acoustic-tagged juvenile steelhead, 2008-10. Survival (SE) and passage behavior metrics are reported as percents (%) and residence/egress time in hours (h) is reported as a median. All survival estimates are single-release and account for mortality from John Day Dam to The Dalles Dam.

Metric ^A	<u>2008</u>		<u>2009</u>		<u>2010^B</u>	
	30% Spill	40% Spill	30% Spill	40% Spill	30% Spill	40% Spill
Passage Survival (%) (John Day to The Dalles forebay)	96.1 (0.5)	94.6 (0.8)	95.5 (1.0)	94.7 (0.8)	94.1 (0.6)	97.4 (0.7)
Spill Passage Efficiency (%)	75.8	72.4	71.5	81.2	87.1	90.2
Fish Passage Efficiency (%)	97.4	96.7	96.8	98.0	98.2	98.2
Forebay Residence Time (h)	4.1	3.9	5.7	5.3	5.1	4.0
Tailrace Egress Time (h)	1.2	1.3	0.5	0.4	0.6	0.6

A – For steelhead, the Accords “no-backsliding” SPE metric range is 45-64 and the delay metric range is 0.3 – 13.4 hours

B – Results from 2010 are preliminary and subject to change pending final analysis and reporting

Subyearling Chinook Salmon - Subsequent to the initial post-construction evaluation in 2008 that resulted in poor survival estimates for subyearling Chinook salmon, the spillway weirs were closed and only spillbays 1 – 14 were used during the summer. Following the improvements made in 2010 (i.e. spillway weir relocation, extended deflector, and new avian deterrent array), the spillway weirs were re-evaluated under 30 and 40% spill, resulting in an increase of 8 – 9% in survival for both treatments compared to previous years (Weiland et al, 2009, 2011, and In Prep). Estimates of SPE and FPE both increased slightly in 2010 over previous years. Estimates of FPE in 2010 represent a reduction in turbine passage, with 30% turbine passage in 2002 compared to 9-14% turbine passage in 2010. In 2010, survival (single-release; from John Day to The Dalles Dam forebay) was estimated to be above 90% under both spill treatments. Estimates of SPE and FPE in 2010 were higher for both spill levels than previous years. Forebay residence times were shorter in 2010 than in previous years. Tailrace egress times in 2010 were similar to 2009, but shorter than in 2008.

Table 3.— Passage behavior and survival metrics used to evaluate 30 and 40% spill at John Day Dam for acoustic-tagged subyearling Chinook salmon, 2008-10. Survival (SE) and passage behavior metrics are reported as percents (%) and residence/egress time in hours (h) is reported as a median. All survival estimates are single-release and account for mortality from John Day Dam to The Dalles Dam.

Metric ^A	<u>2008</u>		<u>2009</u>		<u>2010^B</u>	
	30% Spill	40% Spill	30% Spill	40% Spill	30% Spill	40% Spill
Passage Survival (John Day to The Dalles forebay)	83.5 (1.1)	84.9 (1.1)	84.6 (2.0)	83.3 (2.6)	91.0 (0.8)	90.6 (0.8)
Spill Passage Efficiency	65.7	71.1	69.5	75.8	74.1	81.0
Fish Passage Efficiency	82.0	86.6	83.2	85.4	85.8	90.8
Forebay Residence Time	2.1	2.2	3.7	4.0	1.9	1.8
Tailrace Egress Time	1.5	1.4	0.5	0.5	0.6	0.6

A – For subyearling Chinook salmon, the Accords “no-backsliding” SPE metric range is 58-59 and the delay metric range is 1-3 hours

B – Results from 2010 are preliminary and subject to change pending final analysis and reporting

Conclusion

Analysis of survival data across three years of study suggest that it may be possible to achieve the performance standards at either 30 or 40% spill under the current project configuration. Under both spill operations in 2010, single-release estimates of survival from John Day to The Dalles Dam forebay for both yearling Chinook and juvenile steelhead either exceed or are approaching the spring migrant performance standard for dam passage survival (96%). For subyearling Chinook, 2010 improvements have resulted in more than a 6% survival increase when compared with survival under the 2009 baseline spill operation. Furthermore, it is anticipated that paired-release survival estimates for both spring and summer migrants will be even higher than the single-release estimates presented here. Paired-release survival estimates reflect mortality from dam and immediate tailrace passage, rather than mortality that may occur from dam passage and transit through the entire reservoir to the forebay of The Dalles Dam, as the single-release survival estimates presented here do.

A sensitivity analysis was completed to illustrate the sensitivity of the survival estimates to changes in reference group survival (Table 4). Information presented in Table 4 provides an idea of what level of reference group survival would have been necessary in 2010 relative to 2010 single-release survival estimates for 30 and 40% spill treatments to meet the performance standards. Yearling Chinook salmon reference group survival of $\leq 98.4\%$ would have resulted in paired-release survival estimates of at least 96.0% for 30 and 40% spill operations. Steelhead reference group survival of roughly $\leq 98.2\%$ would have resulted in paired-release survival estimates of at least 96.0% for 30 and 40% spill operations. Subyearling Chinook salmon reference group survival of $\leq 97.8\%$ would have resulted in paired-release survival estimates of at least 93.0% for 30 and 40% spill operations.

Table 4.— Modeled estimates of dam passage survival at varying reference group survival scenarios for 30 and 40% spill. Estimated paired-release survival was calculated using 2010 single-release survival estimates for 30 and 40% spill.

Yearling Chinook			Juvenile Steelhead			Subyearling Chinook		
Reference	30%	40%	Reference	30%	40%	Reference	30%	40%
1.000	0.945	0.950	1.000	0.942	0.978	1.000	0.910	0.906
0.998	0.947	0.952	0.998	0.944	0.980	0.998	0.912	0.908
0.996	0.949	0.954	0.996	0.946	0.982	0.996	0.914	0.910
0.994	0.951	0.956	0.994	0.948	0.984	0.994	0.915	0.911
0.992	0.953	0.958	0.992	0.950	0.986	0.992	0.917	0.913
0.990	0.955	0.960	0.990	0.952	0.988	0.990	0.919	0.915
0.988	0.956	0.962	0.988	0.953	0.990	0.988	0.921	0.917
0.986	0.958	0.963	0.986	0.955	0.992	0.986	0.923	0.919
0.984	0.960	0.965	0.984	0.957	0.994	0.984	0.925	0.921
0.982	0.962	0.967	0.982	0.959	0.996	0.982	0.927	0.923
0.980	0.964	0.969	0.980	0.961	0.998	0.980	0.929	0.924
0.978	0.966	0.971	0.978	0.963	1.000	0.978	0.930	0.926
0.976	0.968	0.973	0.976	0.965	1.002	0.976	0.932	0.928
0.974	0.970	0.975	0.974	0.967	1.004	0.974	0.934	0.930
0.972	0.972	0.977	0.972	0.969	1.006	0.972	0.936	0.932
0.970	0.974	0.979	0.970	0.971	1.008	0.970	0.938	0.934
0.968	0.976	0.981	0.968	0.973	1.010	0.968	0.940	0.936
0.966	0.978	0.983	0.966	0.975	1.012	0.966	0.942	0.938
0.964	0.980	0.985	0.964	0.977	1.015	0.964	0.944	0.940
0.962	0.982	0.988	0.962	0.979	1.017	0.962	0.946	0.942
0.960	0.984	0.990	0.960	0.981	1.019	0.960	0.948	0.944

References Cited

- Beeman, John W., L. Dingmon, S. Juhnke, H.C. Hansel, B. Hausmann, and P. Haner. 2006. Estimates of fish, spill, and juvenile fish bypass passage efficiencies of radio-tagged juvenile salmonids relative to spring and summer spill treatments at John Day Dam in 2002. Annual report of research prepared by U.S. Geological Survey Cook, WA for the U.S. Army Corps of Engineers, Portland District. 53 pp. plus appendices.
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- Weiland, M.A. and 17 co-authors. 2009. Acoustic Telemetry Evaluation of Salmonid Passage and Survival at John Day Dam with Emphasis on the Prototype Surface Flow Outlet, 2008. Annual report of research prepared by the Pacific Northwest National Laboratory for the USACE Portland District. 148 pp. plus appendices.
- Weiland, M.A. and 18 co-authors. 2011a. Acoustic Telemetry Evaluation of Salmonid Passage and Survival at John Day Dam, 2009. Draft report of research prepared by the Pacific Northwest National Laboratory for the USACE Portland District. 137 pp. plus appendices.
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Draft 2011 Spring Fish Operations Plan

INTRODUCTION

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

¹ The 2010 Supplemental BiOp incorporates the 2008 NOAA BiOp

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.

The Corps' Reservoir Control Center (RCC) is responsible for daily management of spill operations responsive to changing TDG conditions. 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.

Establishing daily spill caps entails reviewing existing hourly data at each dam (including flow, spill, temperature, and TDG levels) and consideration a number of forecast conditions (including total river discharge, powerhouse discharge, wind and temperature forecast, etc.). These data are used as input variables used in the System TDG (SYSTDG) model. The SYSTDG model estimates expected TDG levels and is an integral tool in establishing daily spill caps at individual dams.

The spill caps are met using the individual project spill pattern(s) (found in the FPP Sections 2 through 9) that most closely correspond to the specified FOP spill level (note: actual spill levels may be slightly over or under the specified spill discharge or percent value). During the spring freshet, when river discharge is greater than project powerhouse hydraulic capacity with the specified Spring FOP spill level, or when there is a lack of power load resulting in an increase in the spill level, the Corps will attempt to minimize TDG on a system-wide basis. This is accomplished by managing to 125%, 130%, or 135% TDG saturation throughout the system.

Spillway Operations

The Action Agencies will meet the planned FOP 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.

² In February 2009, the State of Oregon modified its waiver for 2009 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.

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 $\pm 1\%$ of the target percentage for the following hour. At Little Goose Dam, when forecast daily average inflows are ≤ 33 kcfs for three consecutive days and indicate a continued downward trend, the project will transition to a constant spill operation (approximately 7-11 kcfs as specified in the FPP) and may spill more or less than $\pm 1\%$. Also, at The Dalles Dam, spill percent may vary up to $\pm 1.6\%$ depending on river discharge. Furthermore, 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 $\pm 1\%$ of best efficiency (Table 1). Values stated in Table 1 are approximations and do not 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 $\pm 1\%$ 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 $\pm 1\%$ 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 $\pm 1\%$ 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 ≤ 3 kcfs, achieving 30% spill requires switching turbine operations between operating 2 units at the low end of the $\pm 1\%$ of best efficiency range to operating one unit at the high end of the $\pm 1\%$ 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 has been coordinated with regional parties through the Fish Passage Operations and Maintenance (FPOM) group and will also be implemented in spring 2011.

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 $\pm 1\%$ 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 $\pm 1\%$ 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. These occurrences may cause individual projects to briefly operate outside of MOP. In addition, unsteady flow at Little Goose and Ice Harbor dams during low flow conditions may impact that project's reservoir elevation and cause inadequate navigation depths at the downstream entrance to the Lower Granite and Lower Monumental dams' navigation locks. Therefore, adjustments to pool elevation in the Little Goose and Ice Harbor pools 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 ≤ 32 kcfs) and will be coordinated in TMT. These adjustments may be necessary for all navigation which includes commercial, non-commercial, 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

³ The 2009 FOP provided: "In exceptionally low water years, when the projected seasonal average flow is less than 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."

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.

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

The planned spill levels presented in Table 2 assume average runoff conditions. Adjustments to these spill rates may be necessary as a result of:

1. Low runoff conditions that may require adjustments in spill level while still meeting project minimum generation requirements.
2. High runoff conditions in which 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 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.

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	30%/30%	performance standard test planned
The Dalles	40%/40%	Same as 2010 (performance standard test planned)
Bonneville	100 kcfs/100 kcfs	Same as 2010 (performance standard test planned)

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 ≤ 33 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 are also included in FPP Section 8.
- 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 (< 38 kcfs) conditions occur in the spring, the full $\pm 1\%$ 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 ≤ 33 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. This provision also applies to both commercial and non-commercial navigation at Lower Monumental Dam. 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 early June. Both spillbay weirs will be removed from service in early to mid-June for the benefit of subyearling Chinook. The exact removal date 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.

Changes in Operations for Research Purposes:

- Spring research operations: Performance standard testing at 30% 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% 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 for 30% 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.

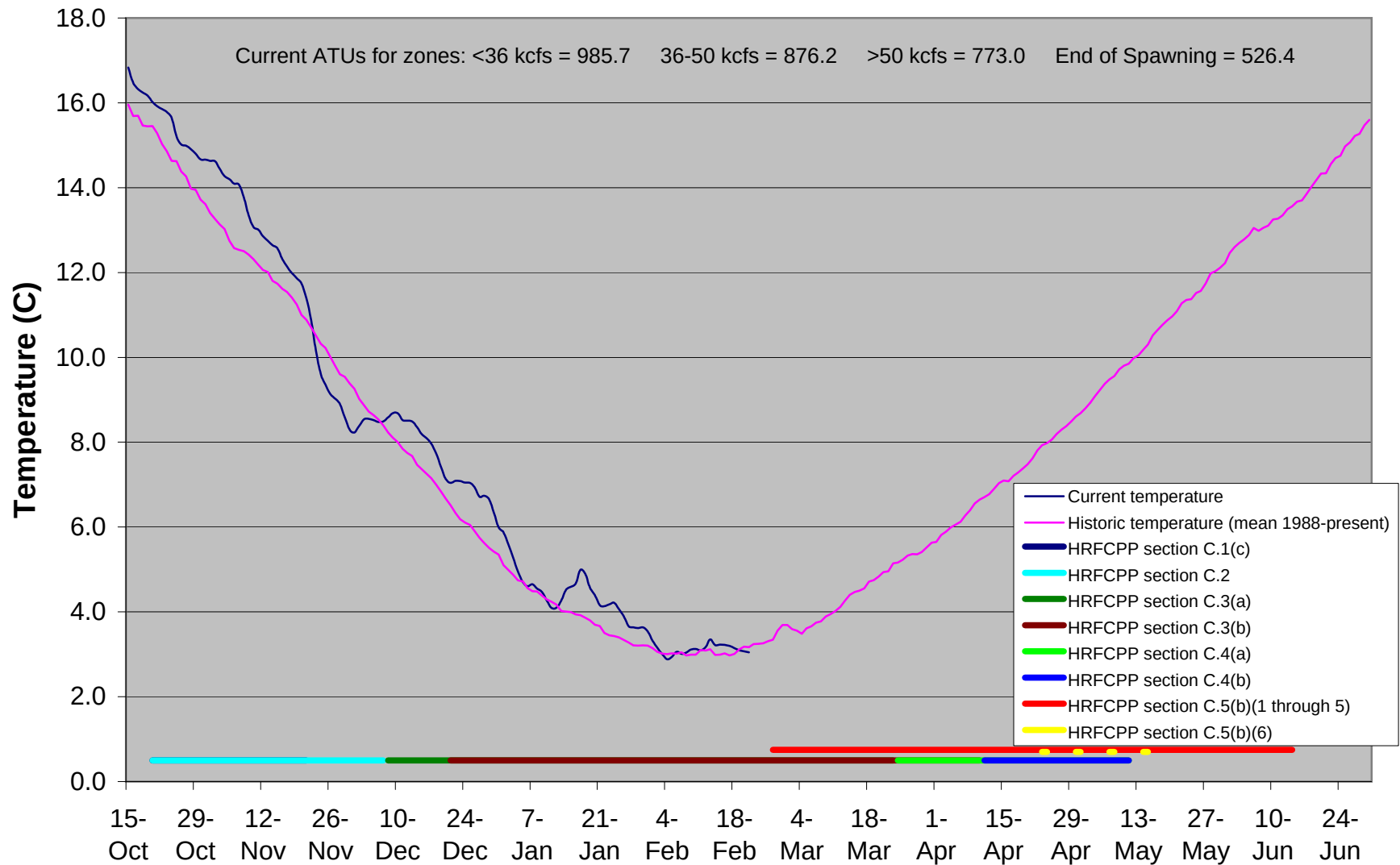
- Flow and spill quantity data for the lower Snake and Columbia River dams are posted to the following website every hour:
<http://www.nwd-wc.usace.army.mil/report/projdata.htm>
- Water Quality: TDG and water temperature data are posted to the following website every hour: <http://www.nwd-wc.usace.army.mil/report/total.html>. 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/html/

DRAFT

2010-2011 PRD Tailrace Temperatures and HRF CPP constraints



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

February 23, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Review Meeting Minutes/Notes

TMT members provided two comments on the February 9 Official Minutes:

- Under the Dworshak discussion (page 6), language TDG impacts needs to be clarified. **Action:** Steve Hall, Walla Walla District, will email language corrections to the COE Division office for inclusion in the revised notes.
- Under the Pinnipeds report, the task force was a ‘multi-entity’ task force (not a ‘state’ task force).
- With the above corrections, the February 9 notes were considered final.

Vernita Bar Update

Russell Langshaw, Grant County PUD, provided an update on Hanford Reach protection flows operations, which he said were scheduled to begin on 2/26. The figure he provided plotted the current and historical temperatures and predicted the start and stop of the operation. Russell said he would provide updates to TMT as the operation progressed. Additional information can be found on the Grant County PUD website, which was included as a link to the file posted to the TMT agenda. Russell concluded by saying this year had seen warmer than average temperatures but that they were returning to normal. Given this, it was anticipated the protection operation would likely end sometime the second week of June.

Fish Operations Plan

Dan Feil, COE, shared information about the draft Spring Fish Operations Plan (FOP) and John Day white paper that were posted to the TMT agenda late on 2/22. The white paper summarizes three years’ of evaluations of spill tests at John Day and is being used to inform the Spring spill plan proposal for the project. John Day spill, he said, was the only proposed change to spring spill operations from 2010 – the proposal is to conduct performance standard testing of 30% spill at the project. Dan also responded to a question about transportation operations, saying that the plan was to spill in May and start transportation using the same criteria and a staggered approach as was done in 2010. Low flow operations were included in the FOP. Dan suggested this may not be an issue this year given the current normal or above normal water supply forecasts. He also noted a correction would be made to the John Day white paper, on page 3, to update the juvenile steelhead numbers.

Next Steps/Action: Comments or questions on the draft FOP should be directed to Dan Feil by COB on Wednesday, 3/2: dan.h.feil@usace.army.mil or (503) 808-3727. A track changes version of the document was not available according to Feil, but the 2010 FOP was posted to the TMT web page for comparison. The COE hopes to finalize the FOP by 3/11. It was noted that the RIOG would be meeting on Monday, 2/28, to discuss the FOP.

RFC Water Supply Forecast

Steve King, NOAA-RFC, shared an overview of the conditions and forecasts for 2011. He said generally, water supply was above normal in the Upper Columbia, Western Montana and Upper Snake; and below normal in Central Washington, Western Oregon and Middle Snake. While the primary assumption that goes in to the early year forecasts is 100% of normal precipitation, observed precipitation in January was 94% above Ice Harbor, 144% above Grand Coulee, and 120% above The Dalles. Runoff, he said, was strong as a result of above normal precipitation and warmer temperatures – this means that runoff volumes shifted to an earlier time period, but did not necessarily indicate that strong runoff would hold up further along in the season. Snow conditions were generally strong on the eastern side and weak on the western side (with the exception of NE Oregon, which showed fairly strong snow conditions) at this point in the year. ENSO revealed a La Nina condition that was expected to continue through the Spring, then approach neutral around the Summer months. Steve clarified that ENSO, with fairly weak correlations to water supply, is not a preferred forecasting tool especially later in the season. Overall, the 1 month outlook for precipitation conditions showed near normal, while the three month outlook showed equal chances for above or below normal conditions. The 1 and 3 month outlook for temperature showed below normal conditions.

Steve went in to more detail about the model assumptions and the official and ESP water supply forecasts throughout the basin. The forecasts were as follows:

Project	“Official” WSF	ESP WSF*
Libby	102%	100%
Hungry Horse	114%	102% (2-week old forecast)
Coeur d Alene	104%	114%
Grand Coulee (Jan-July)	104%	98%
Jackson Lake	103%	109%
Snake near Irwin	103%	92% (not current)
Dworshak	105%	109%
Lower Granite	99%	98%
Okanagen	92%	82%
Yakima	87%	84%
John Day	106%	108% (not current)
The Dalles	101%	99%

*The power point provided at the meeting showed earlier ESP forecasts – the percentages listed above were the most up to date predictions that Steve shared at the meeting, except where noted.

Steve walked the group through the RFC website to show information and formatting updates that were intended to make the data more useful, user friendly and transparent. He encouraged TMT members to communicate with him suggestions for different information, formatting, etc. that would be useful to this team. He provided his contact information: Stephen.king@noaa.gov and (503) 326-7291. He commented that the RFC, a non-regulatory agency, would like to move away from regulated flow forecasting, although the information they provide could (and likely would) still be used by regulatory agencies for that purpose. As such, RFC is developing survey questions that will be distributed to regional partners to help inform the change. The next webinar is scheduled for 3/8 and will include a similar presentation as was provided at TMT today, with updated data. Information about the webinars can be found on the RFC website.

TMT members commented that the improvements to the web were all positive changes and very useful, and thanked Steve for presenting the information today. Steve acknowledged his staff, Don Lorraine, for his work on the web changes.

Tony Norris, BPA, pointed out the ‘Seasonal Update’ to the Water Management Plan, posted on the TMT web page, that included the latest water supply forecast information. The COE was asked about the phase out of their STP model, to which Karl Kanbergs responded that this will happen eventually but not in the near future. TMT will be engaged in a discussion on this topic later this year.

Dworshak Operations

Karl Kanbergs, COE, and Steve Hall, Walla Walla District COE, shared an update on Dworshak operations, noting that a deviation request for the February flood control target had been drafted and was being discussed between the two offices. The updated target elevation, which was communicated to TMT from Steve Barton on 2/16, was 1506’. The COE will make decisions about how to operate the project in March based on updated forecasts, risk assessment and discussions between the COE, the Columbia River Forecast Group (CRFG), TMT and other appropriate regional partners. The CRFG was scheduled to meet on 2/25 to look at the various forecasts and discuss the reason for the disparity between the various forecasts that had been pointed out at the last TMT meeting. The COE is also looking at future official forecasting changes for this project, and impacts to other regional negotiations, e.g. the Columbia River Treaty. Steve Hall added that the snow stations in the area were averaging about 100% of normal, and noted that Walla Walla District uses this as one indicator along with near and long range water supply forecasts to make decisions about how to operate Dworshak.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects: Grand Coulee was at elevation 1269.1’ and drafting toward spring targets for flood control and drum gate maintenance. Hungry Horse was at elevation 3524.22’, with 8.3 kcfs outflows. Karl

Kanbergs, COE, reported on projects: Libby was at elevation 2395.77', with 5 kcfs inflows and 15.96 kcfs outflows. The project is expected to end February at or below its end of February target elevation of 2392.7'. Albeni Falls day average outflows were 23.2kcfs. Dworshak was at elevation 1507.26', with 4.1 kcfs inflows and 6.5 kcfs outflows. Lower Granite day average outflows were 51.6 kcfs; McNary day average outflows were 175 kcfs, and Bonneville day average outflows were 195.3 kcfs.

Power system – Tony Norris, BPA, reported that a draft Record of Decision re: wind integration was available for review on the www.bpa.gov website, along with announcements for upcoming public meetings on this topic. The next meeting was scheduled for 2/25 at 9:30 am at BPA.

Water quality – Laura Hamilton, COE, reported that the 2010 TDG and Temperature Report was posted to the TMT web page. She said the fixed monitoring stations would be on line in mid-March and TMT would be hearing more updates on water quality at that time.

Next Meeting, March 9, 9:00 am

Agenda items include:

- Water Supply Forecasts
- Dworshak Operations
- FOP Update
- Spill Priority List
- BPA Emergency Action Plan List
- Operations Review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

February 23, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Karl Kanbergs, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of BPA, BOR, NOAA, USFWS, Montana, the COE, NWRFC, Washington, Idaho, CRITFC and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Review Meeting Minutes for February 9, 2011

The latest version of the facilitator's notes with comments incorporated is now posted to the TMT page. There were no additional comments today so the facilitator's notes are considered final.

There were two changes to the official minutes:

- Agenda item 5, Dworshak Water Supply Forecasts. Paul Wagner, NOAA, noted that the Dworshak hatchery has seen problems with prolonged TDG levels above 105%, not 115% as stated. Steve Hall, COE Walla Walla, will make this revision to the minutes.
- Agenda item 3. Pinniped Update. Robin Gumpert noted that the pinniped task force isn't just states, but a multi-agency task force. Doug Baus, COE, will make this revision. With these two changes, the official minutes will be considered final.

3. Vernita Bar Update

Russell Langshaw, Grant PUD, gave the first of his ongoing in-season updates on the Hanford Reach protection program. Grant PUD plans to initiate rearing protections on February 26, 2011. As of February 21, 985.7 temperature units had accrued. Updated data for the Hanford Reach fall Chinook program will be available on the Grant PUD website beginning February 26. Langshaw predicted that the protection program would end the second week of June. He will give another update at the next TMT meeting March 9.

4. Fish Operations Plan Update

Dan Feil, COE, introduced two links to this item on today's agenda. The draft spring FOP, the first link, is available for TMT members to review.

Comments are due by close of business March 2. Email comments to dan.h.feil@usace.army.gov, phone 503-808-3727.

The draft spring FOP contains sections on TDG management, low flow operations, transport operations, minimum generation and spill. Table 2 on page 9 summarizes proposed spring spill operations. Many of these are the same as last year, with the notable exception of John Day, which will be affected by plans to conduct BiOp performance testing at all three of the lower Columbia projects. The COE plans to release the final version of the spring FOP by March 11.

The second link to this item on today's agenda is to a white paper on John Day, which is also available for review. Feil noted a probable correction on page 3, where the reduction in turbine passage for juvenile steelhead should be 10-11%, not 70% of the run as stated. Feil will double-check this.

Transport operations in 2011 will be much the same as in 2010, with a staggered start of downstream collections for transport. Low flow operations are included in the Little Goose plan, but the current water supply forecast implies low-flow operations will likely not be necessary this year. TMT will revisit the spring FOP at its next meeting on March 9.

5. Water Supply Forecast Update

Steve King, NWRFC, gave a Power Point presentation on how the regional water supply forecast is shaping up for this year's fish passage season. He used the February mid-month forecast, issued February 17, as the basis for today's discussion. The ESP results from February 14 shown in the slides were updated this morning; he provided verbal updates for the new numbers. In running the forecasting model, the NWRFC made a primary assumption that spring precipitation will be 100% of normal, i.e. average. The assumption is based on several inputs including CPC climate outlooks and short term meteorological weather models.

At this point, the largest forecast, with respect to normal, is for the Clark Fork in western Montana; the smallest is for the western Cascades in Washington. King went over observed conditions (precipitation, runoff and snow pack), then discussed future conditions and forecasts for the individual basins of the Columbia system.

Precipitation: Rain has been stronger than normal in the southern tier and in western Montana. King noted that western Montana contributes 30% of runoff in the Columbia basin and another 30% comes from the Canadian portions of British Columbia. Any deviation from normal in these two areas is significant because it will play a key role in keeping flows up at The Dalles.

The January final forecast, issued early in January, assumed 100% of normal precipitation for the month of January. Observed precipitation for the month ended up at 120% of normal for the region, though areas in the Snake River and Montana were drier than normal. Conditions in February so far have been dry with the exception of the Clark Fork in the Flathead basin. Precipitation is strong in mountainous areas that produce most of the regional water supply.

Runoff: Volumes have been significant this year, largely the result of above normal precipitation combined with warm temperatures in the north. This caused a lot of mid-elevation snow to melt while the highest elevations held their snowpack. While runoff looks plentiful now, King cautioned that variations in forecasting periods and the fact that many regression models don't note timing can alter the outcome.

Snowpack: King chose six random SNOTEL locations to demonstrate that snowpack was generally above normal in the Rockies, but less than normal elsewhere.

Future conditions: The Northwest has been in a strong La Nina cycle since September 2010, as reflected by negative sea surface temperature anomalies. The La Nina trend is expected to last for a few more months, after which ocean conditions are expected to become more neutral by summer and fall. Last year, by contrast, was a strong El Nino year.

Jim Litchfield, Montana, questioned the common wisdom that says ENSO signals can predict whether it'll be a low or high volume year. King responded by showing a plot of SST vs runoff for Jan-Jul flow at The Dalles. Tony Norris, BPA, asked whether the picture changes much if the April-August timeframe is used; King didn't believe so. Paul Wagner, NOAA, asked whether the ENSO index is a useful tool as a forecast parameter. Generally, as more information accrues during the season, the RFC relies less on ENSO parameters in its forecasting, King said. He showed TMT the Climate Prediction Center's three-month precipitation outlook, which indicates that there is no preference for wet, dry, or neutral condition and that these conditions are forecasted to have an equal probability of occurrence. King noted that for many areas of the basin, especially in the southern tier basins of Oregon and Idaho, spring rain can be an important factor in the water supply outcome. He also emphasized that it can be very difficult to give long lead time predictions for heavy late season precipitation, as was the case in 2010.

Temperatures: In the short term, temperatures have been and will likely continue to be below normal.

Water supply forecasts: King gave forecasts for specific projects:

- Libby – 102% of normal Hungry Horse – 114%

- Coeur D'Alene – 104% of normal Grand Coulee – 104% of normal (January-July)
- Jackson Lake – 103% of normal
- Palisades – 103% of normal
- Dworshak – 105% of normal
- Lower Granite – 99% of normal (January-July)

He then gave updated ESP predictions based on that morning's ESP run:

- Dworshak – 109% of normal
- Palisades – 100% of normal
- Lower Granite – 99% of normal (January-July)
- Lower Columbia at Tonasket –82% of normal
- Yakima at Parker –84% of normal
- Service Creek at John Day – 109% of normal (The Dalles – 99% of normal (January-July)

King noted that tomorrow, February 24, the early bird forecast for March will be released. He explained that the RFC has updated its interactive tools on their web page, and the older version of these tools will be phased out eventually. He showed TMT members how to access the new presentation by clicking on circled areas of the RFC's water supply forecast map. He asked TMT members to let him know whether the available forecast periods meet their needs. Tony Norris, BPA, noted that the BiOp-preferred forecasting periods are January-July and April-August.

A phone participant asked whether there are monthly forecasts; King said no. The forecasts are updated monthly but they are period forecasts. He showed TMT the data normals page posted online, which provides individual months of observed information back to 1971, as well as how to use the new interactive tool to design their own forecasts.

The RFC hopes to shift away from issuing regulatory flow forecasts because it is not a regulatory agency, King announced.

The BiOp has certain requirements for regulated forecasts, Kanbergs added, so there will ultimately be some form of a long term forecast. In the meantime, the STP single trace forecast is being used. It may turn out that regulated forecasts will appear on the COE website instead of the RFC website. This change will happen sometime in the next year or two, with further discussion at TMT later this summer.

Norris showed TMT the continually updated water supply forecasts that are posted in the seasonal update to the WMP. King invited TMT members to contact him with any further questions regarding today's presentation at

stephen.king@noaa.gov, phone 503-326-7291. TMT will revisit the regional water supply forecast at its next meeting March 8.

6. Dworshak Update

Kanbergs and Hall gave updated information on Dworshak operations since the last TMT meeting, when TMT discussed the Joint Technical Staff memo highlighting a disparity between the COE principal components forecast and other forecasts. In response to concerns about this disparity, the COE is internally discussing a deviation from the required end of February flood control elevation to limit the end of February elevation at Dworshak to no higher than 1,506 feet, Kanbergs announced. This information was conveyed to TMT via email by Steve Barton on 2/16. The official end of February elevation is 1,496.8 feet. Kanbergs reiterated what King had said during his presentation: it can be very difficult to predict heavy precipitation late in the season. The COE will keep TMT informed of the outcome of the deviation request.

Hall said snowpack in the Dworshak basin is 103% of normal, an increase over the past few days. Individual snow stations range from 92% to 126% of normal, with most around 100% of normal. The water supply at Dworshak is heavily driven by snowpack, rather than spring rains, Hall said. Kanbergs noted that the long range climate forecast continues to show wetter and cooler than normal conditions. The wetter climate forecast did not hold for the first part of February. TMT will revisit Dworshak operations at its next meeting.

7. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,269.1 feet, drafting toward spring flood control targets and required drum maintenance next month. Hungry Horse is at elevation 3,524.22 feet, discharging 8.3 kcfs. Libby is at elevation 2,395.77 feet, with inflows of 5 kcfs and average releases of 15.96 kcfs. The end of February elevation target is 2,392.7 feet.

Albeni Falls is at elevation 2,055.5 feet, operating between 2,055-2,056 feet elevation with average releases of 23.2 kcfs. Priest Rapids flows are 132.4 kcfs. Dworshak is at elevation 1,507.26 feet, drafting slightly, with 4.1 kcfs inflows and 6.5 kcfs outflows. The project has cut back from full powerhouse flows and will operate at or below elevation 1,506 feet pending the outcome of the deviation request.

Lower Granite is discharging 51.6 kcfs average flows and has been close to 50 kcfs for the past 5 days. McNary is discharging 175 kcfs average flows, down from 200 kcfs for most of the week. Bonneville is discharging 195.3 kcfs.

b. Fish. There was nothing to report today.

c. Power System. BPA has issued a draft Record of Decision regarding environmental dispatch of wind integration during high wind conditions. The ROD is available on the BPA web page.

d. Water Quality. The COE has released its annual TDG and temperature report, Laura Hamilton, COE, reported. The report is available on the RCC water quality page under water quality data.

3. Next Meetings

The next TMT meeting in person will be March 9. The water supply forecast, Dworshak operations, a FOP update, the spill priority list, and the BPA emergency action plan will be on the agenda.

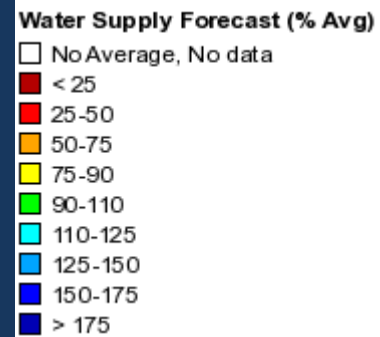
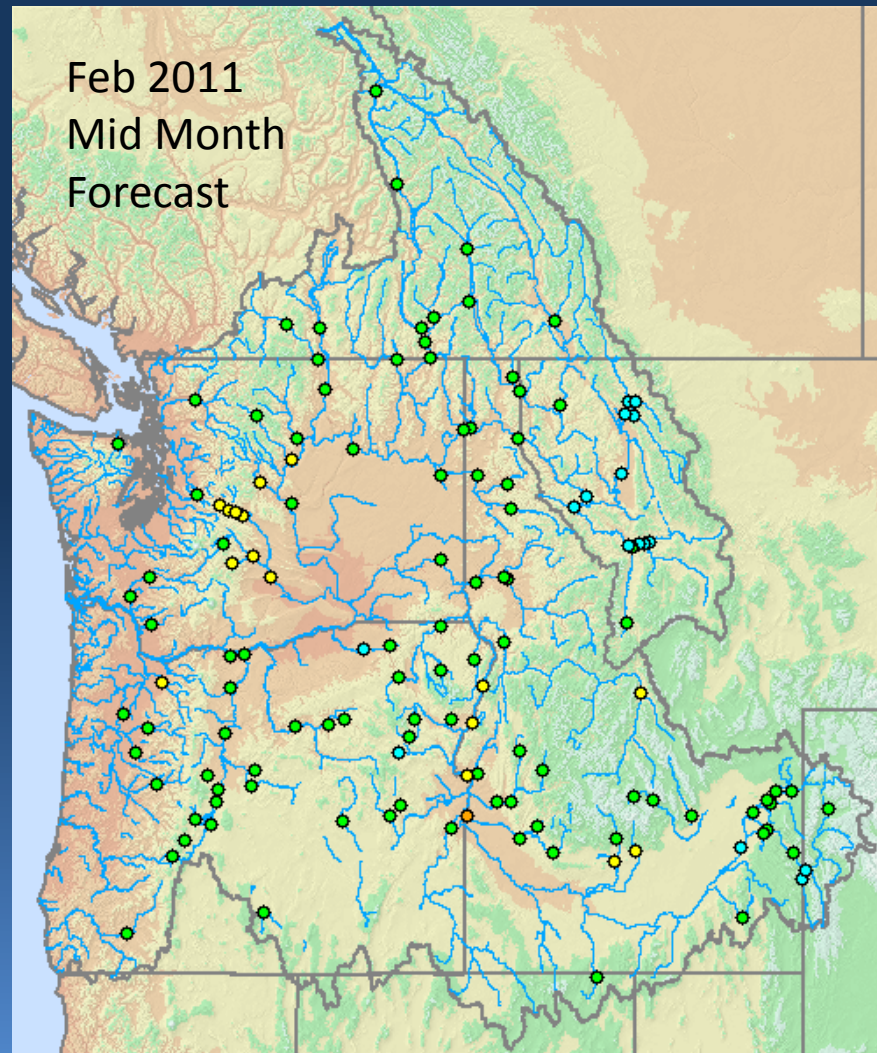
<i>Name</i>	<i>Affiliation</i>
Tony Norris	BPA
John Roache	BOR
Paul Wagner	NOAA
David Wills	USFWS
Jim Litchfield	Montana
Karl Kanbergs	COE
Steve King	NWRFC
Doug Baus	COE
Laura Hamilton	COE

Phone:

Mike Shapley	Snohomish PUD
Tim Heizenrader	Centaurus
Margaret Filardo	FPC
Dave Benner	FPC
Russ George	WMC
Bruce McKay	Consultant
Richelle Beck	DRA
Barry Espenson	CBB
Tom Le	Puget Sound Energy
Russell Langshaw	Grant PUD
Cindy LeFleur	Washington
Scott Bettin	BPA
Tom Le	Puget Sound Energy
Greg Bowers	COE
Richelle Beck	DRA
Steve Rowe	COE
Russ Kiefer	Idaho
Tom Lorz	CRITFC/Umatilla
Alex Cibarra	Grant PUD
Tracy Schwartz	COE Walla Walla



Northwest River Forecast Center Water Supply Briefing



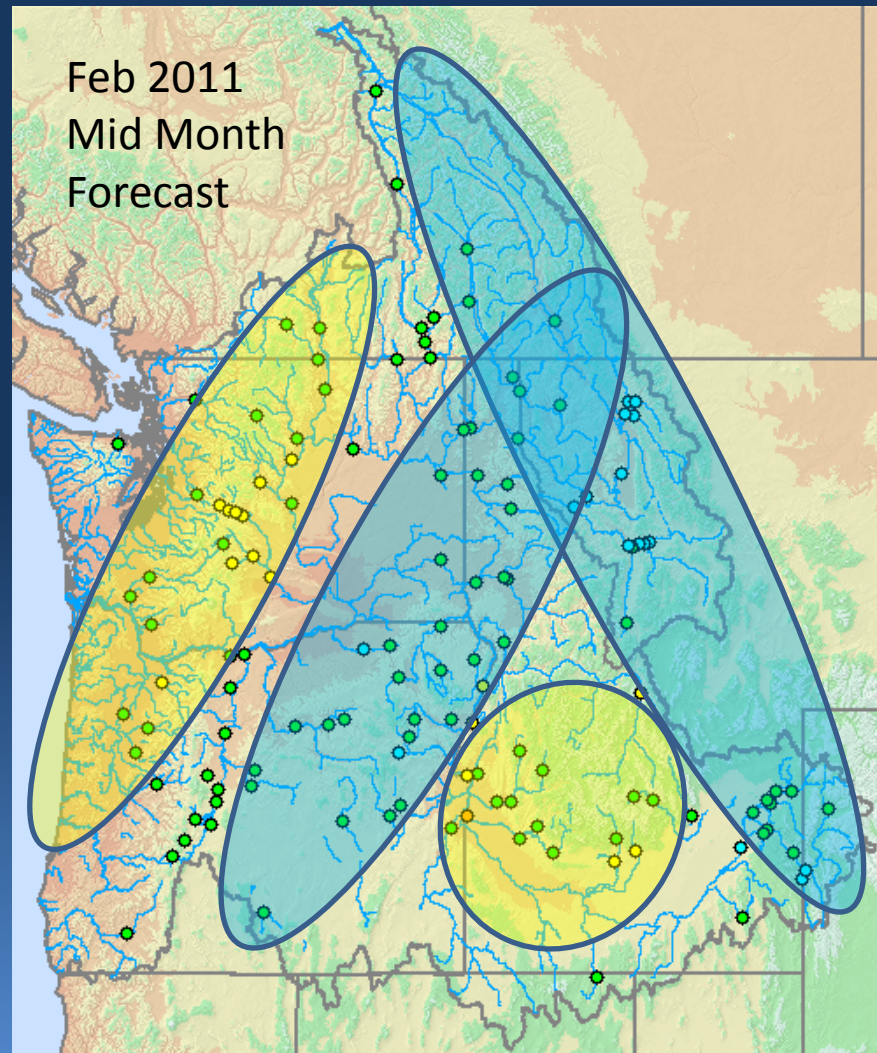
Feb "Mid Month" Forecast
Legacy Regression Technique
(2/17/11)

Ensemble Streamflow Procedure (ESP)
(2/14/11)

Precipitation Forecast:
100% of Normal



Northwest River Forecast Center Water Supply Briefing



Water Supply Forecast (% Avg)

□	No Average, No data
■	< 25
■	25-50
■	50-75
■	75-90
■	90-110
■	110-125
■	125-150
■	150-175
■	> 175

General Outlook:

Above Normal Forecasts

Upper Columbia
Western Montana
Upper Snake

Below Normal Forecasts

Central Washington
Western Oregon
Middle Snake



Observed Conditions



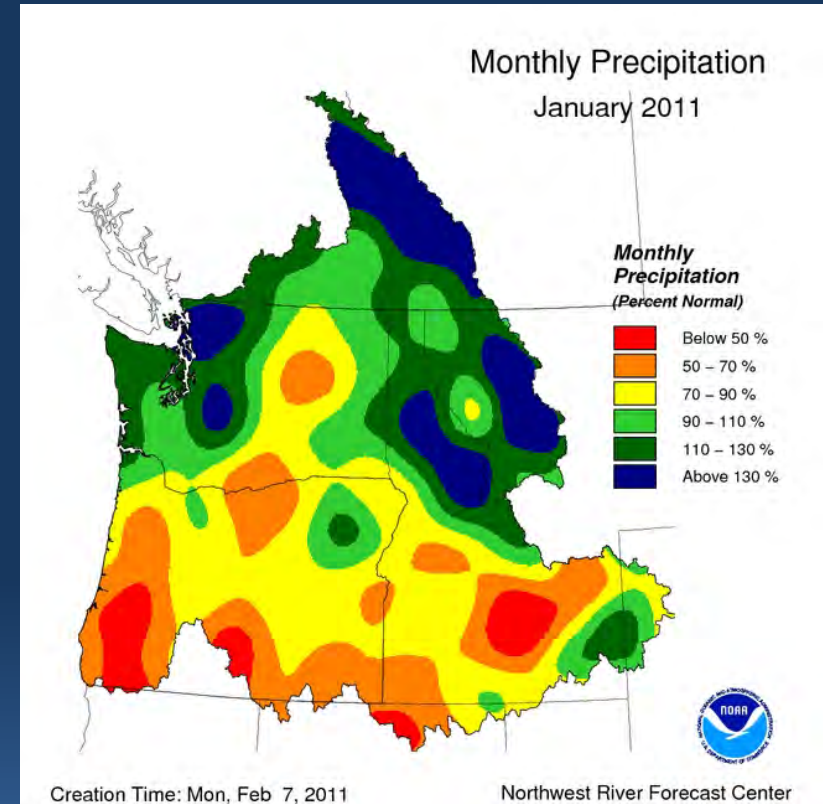
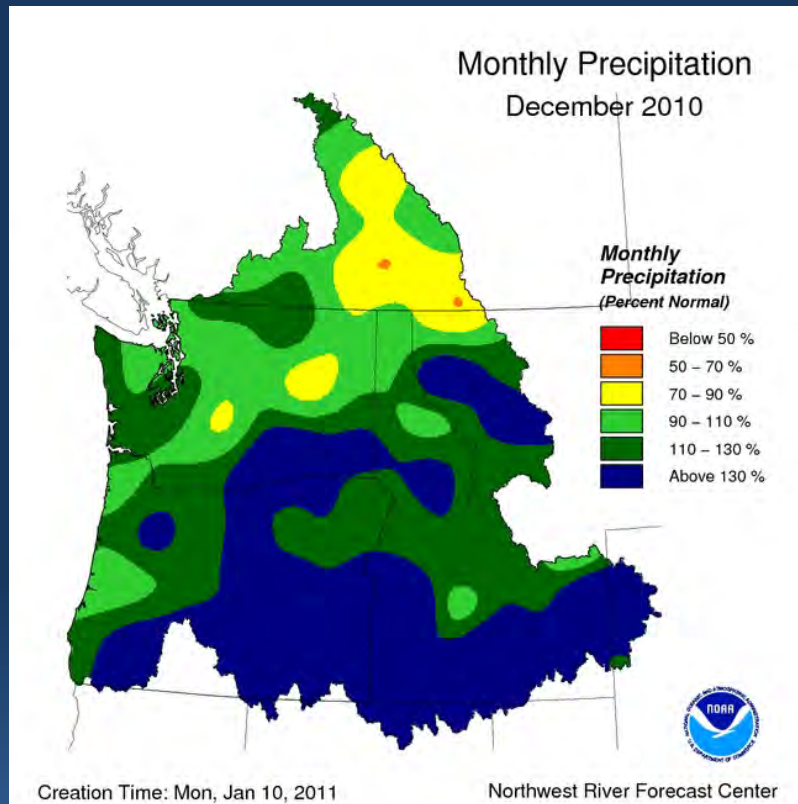
Precipitation

Runoff

Snowpack



Observed Monthly Precipitation



January Final Forecast precipitation assumption
= 100% of Normal

Observed January precipitation

above Ice Harbor = 94%

above Grand Coulee = 144%

above The Dalles = 120%

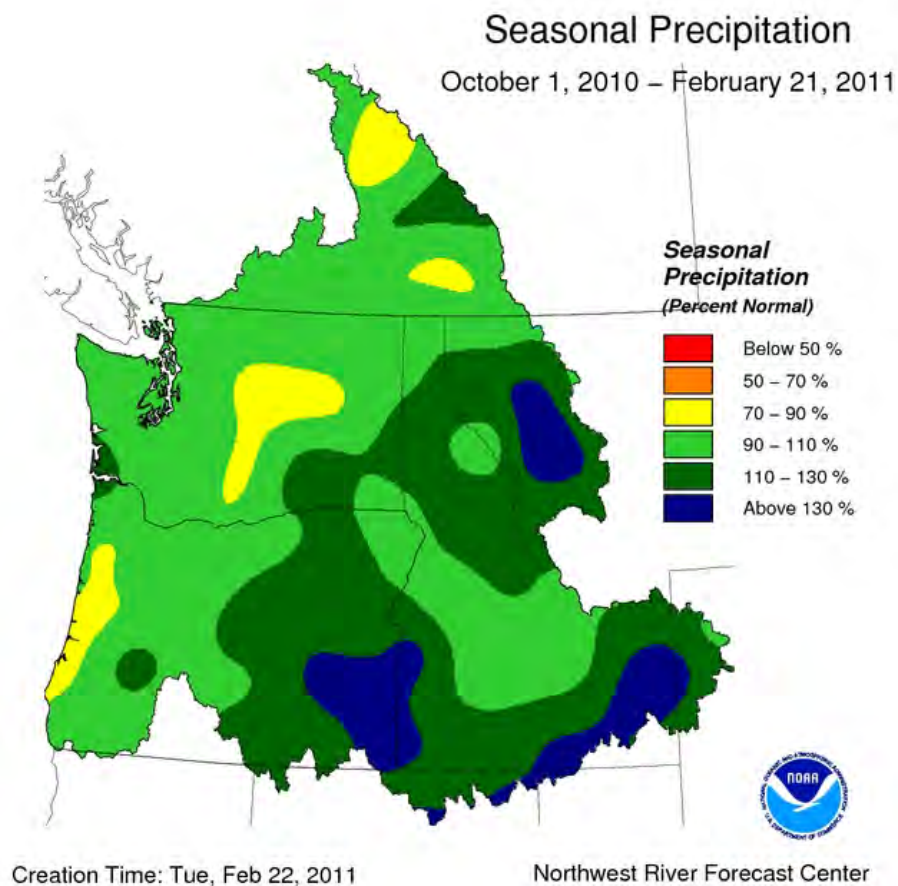


Observed Seasonal Precipitation

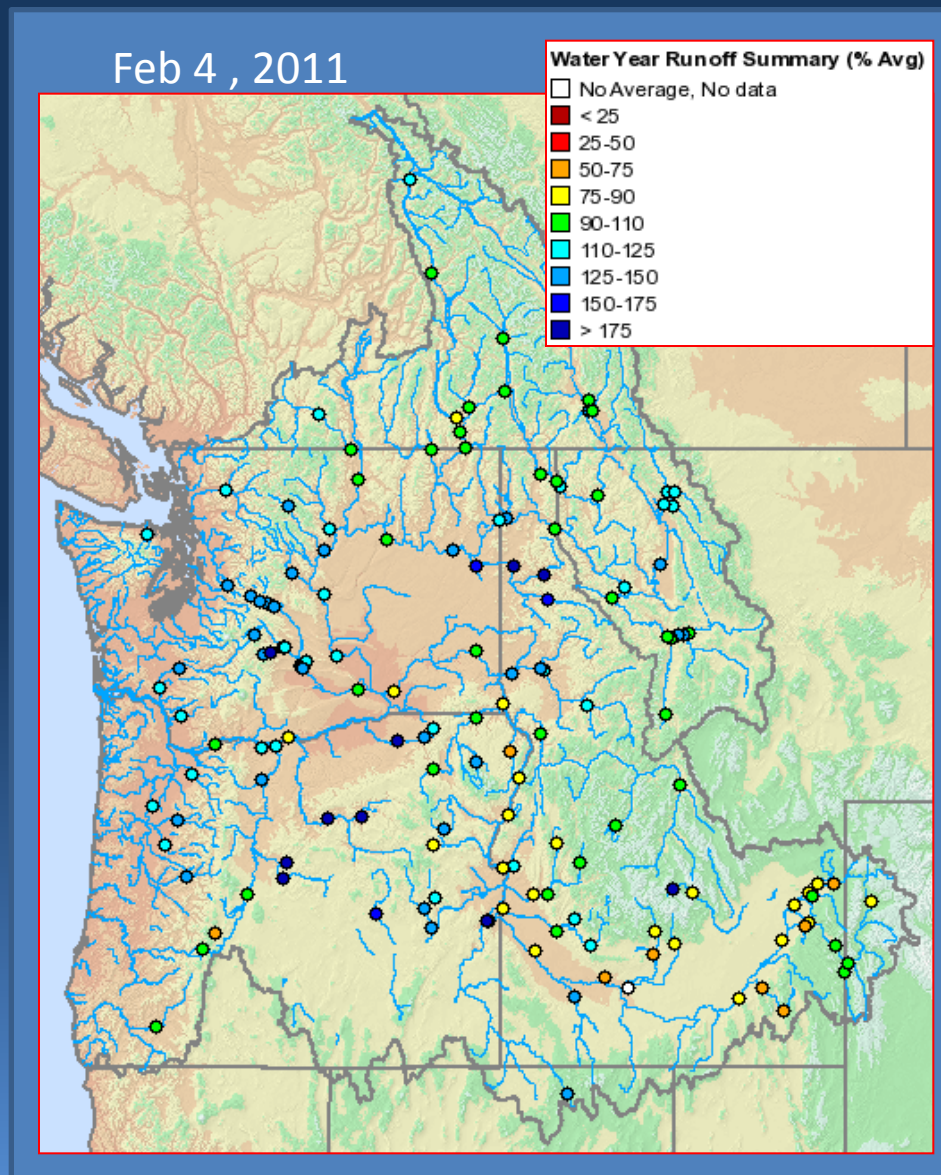
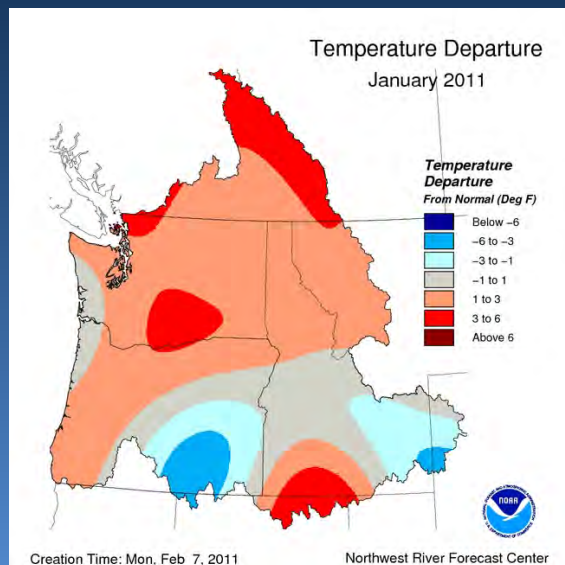
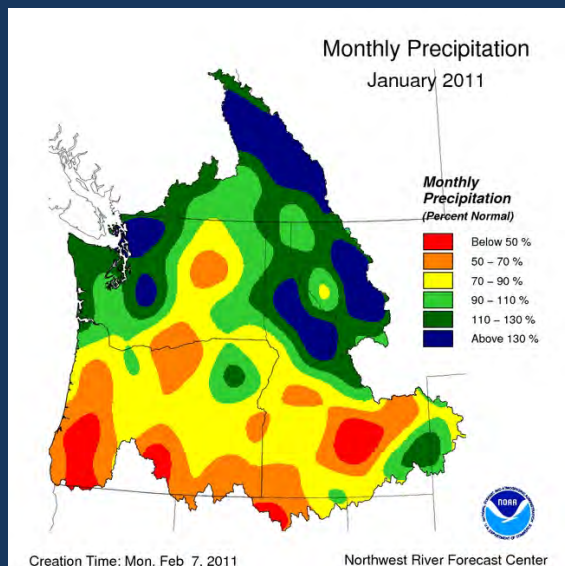


(Weekly Summary: 12Z feb 1 - 21, 2011)

DIVISION	..FEB TO DAY 21..			OCT - FEB....		
	OBSD	DEP	PCT AV	OBSD	DEP	PCT AV
COLUMBIA ABOVE COULEE	1.64	0.14	109.	12.82	0.86	107.
SNAKE RV AB ICE HARBOR	0.96	-0.25	80.	9.48	1.24	115.
COLUMBIA AB THE DALLES	1.42	-0.17	89.	12.67	0.82	107.
COLUMBIA AB CASTLEGAR	2.00	-0.12	94.	16.38	-0.87	95.
KOOTENAI	1.57	0.11	108.	12.40	0.08	101.
CLARK FORK	1.33	0.34	135.	9.15	1.68	123.
FLATHEAD	1.60	0.28	122.	12.66	2.55	125.
PEND OREILLE/ SPOKANE	2.20	-0.08	96.	18.01	1.35	108.
NORTHEAST WASHINGTON	1.01	-0.18	85.	8.91	0.10	101.
OKANOGAN	0.99	-0.04	96.	7.37	-0.15	98.
EAST SLOPES WASH CASC.	2.00	-1.70	54.	21.77	-5.16	81.
CENTRAL WASHINGTON	0.32	-0.33	49.	4.50	-0.37	92.
UPPER SNAKE	1.01	-0.31	76.	11.21	2.04	122.
SNAKE RIVER PLAIN	0.39	-0.27	59.	5.73	0.97	120.
OWYHEE/ MALHEUR	0.58	-0.17	77.	6.92	1.75	134.
SALMON/ BOISE/ PAYETTE	1.04	-0.50	67.	10.89	0.58	106.
BURNT/ GRANDE RONDE	1.09	0.04	104.	8.41	0.54	107.
CLEARWATER	2.24	0.09	104.	17.10	2.01	113.
SOUTHEAST WASHINGTON	1.21	-0.25	83.	10.44	0.35	104.
UPPER JOHN DAY	0.79	-0.12	87.	8.23	1.25	118.
UMATILLA/ LWR JOHN DAY	1.24	0.06	105.	9.82	1.48	118.
UPR DESCHUTES/ CROOKED	1.28	0.14	112.	9.73	1.53	119.
HOOD/ LOWER DESCHUTES	1.67	-0.90	65.	19.40	1.42	108.
NW SLOPE WASH CASCADES	5.85	-1.49	80.	53.16	-1.20	98.
SW WA CASCADES/COWLITZ	3.69	-2.62	58.	41.33	-2.96	93.
WILLAMETTE VALLEY	3.61	-1.82	66.	34.83	-2.24	94.
ROGUE/ UMPQUA	3.33	-0.06	98.	22.73	0.17	101.
KLAMATH BASIN	1.22	-0.38	76.	11.07	0.00	100.
LAKE COUNTY-GOOSE LAKE	0.56	-0.35	62.	6.97	0.92	115.
HARNEY/ MALHEUR BASIN	0.56	-0.17	77.	6.91	1.71	133.



Current Runoff Conditions

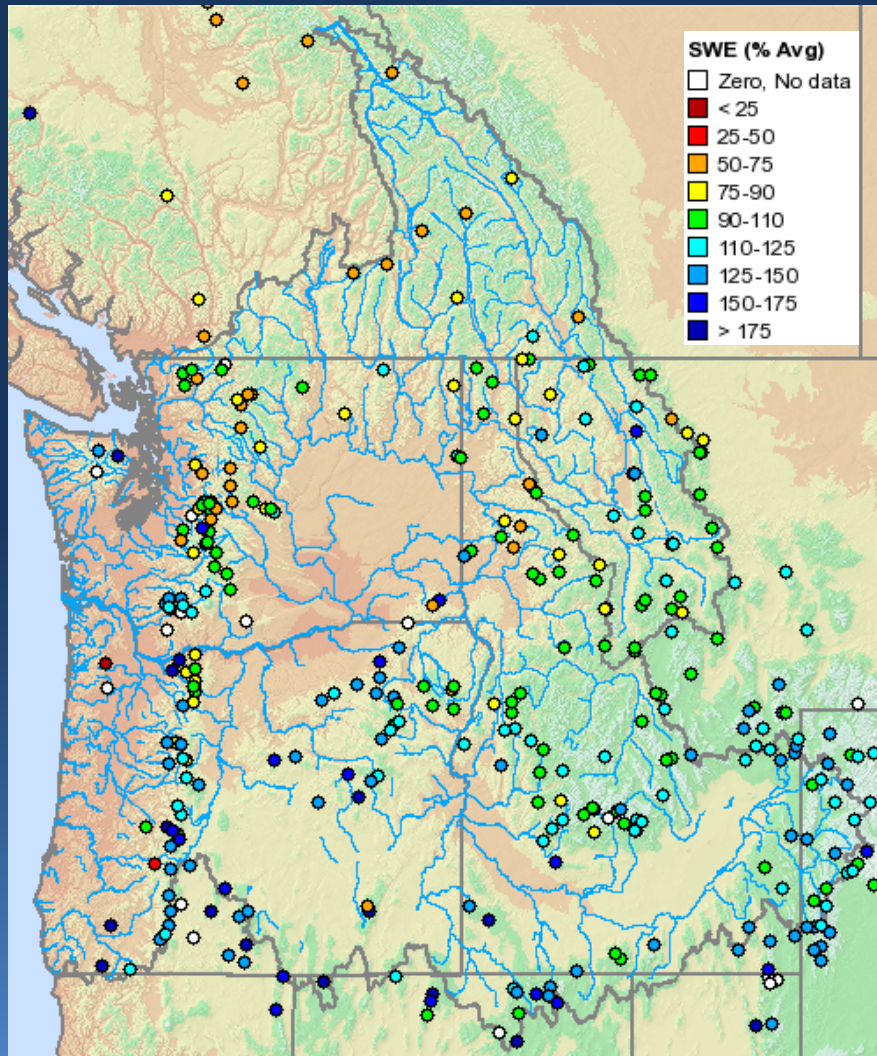




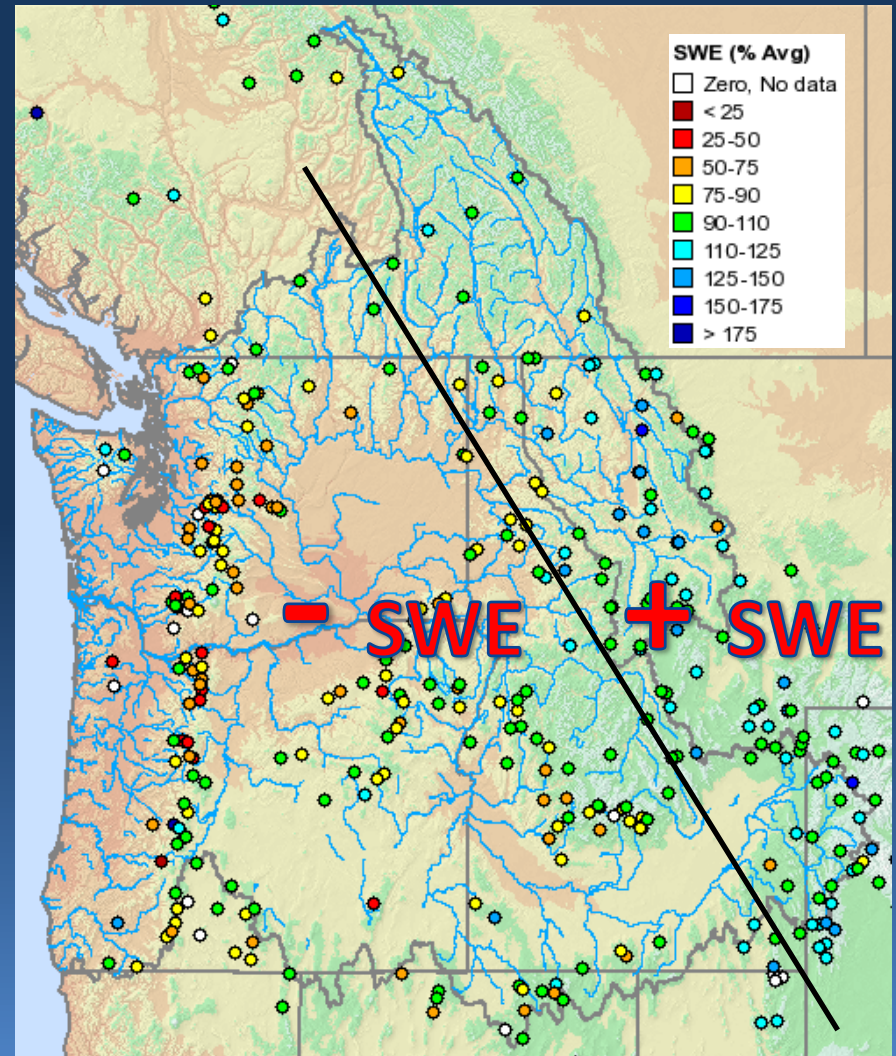
Current Snow Conditions



Jan 7, 2010

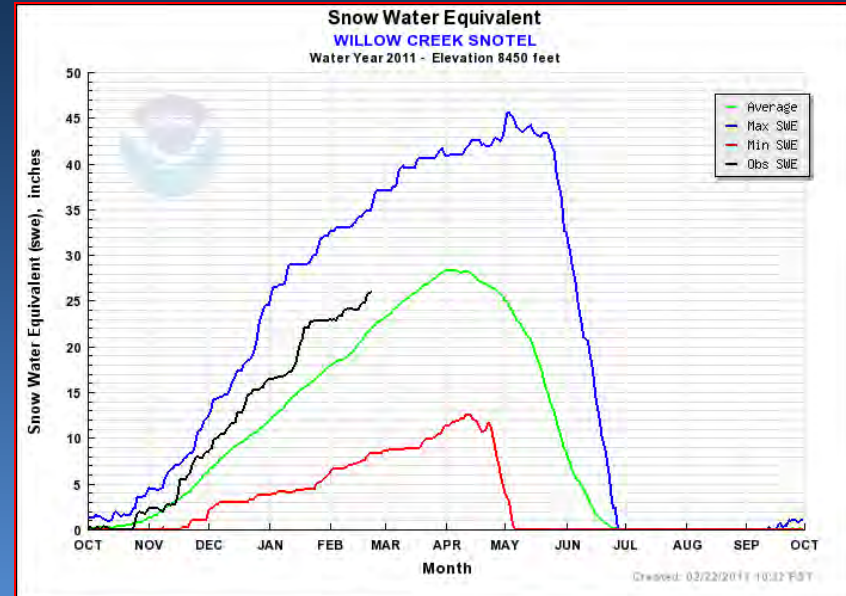
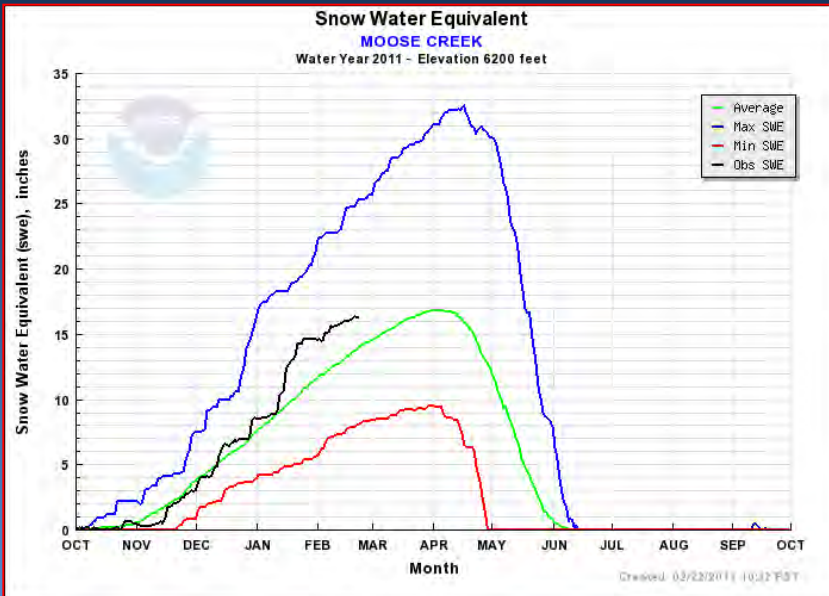
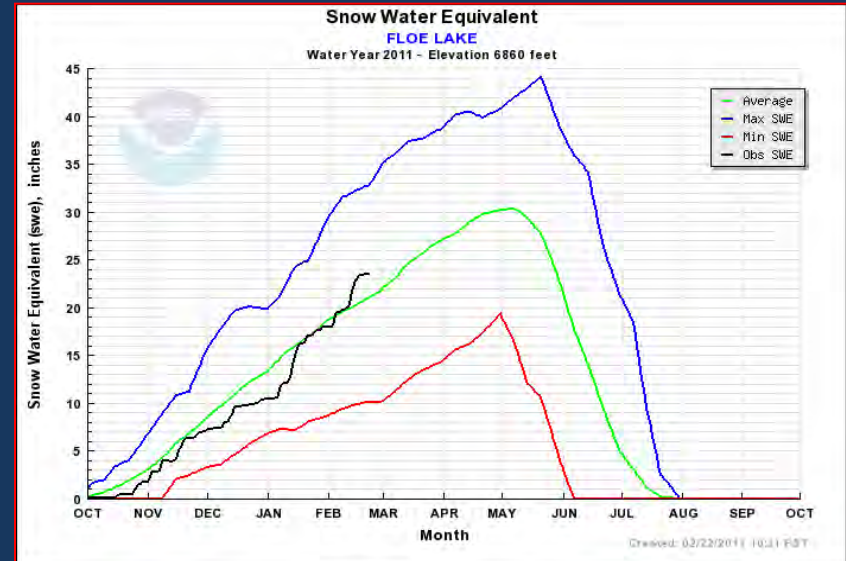
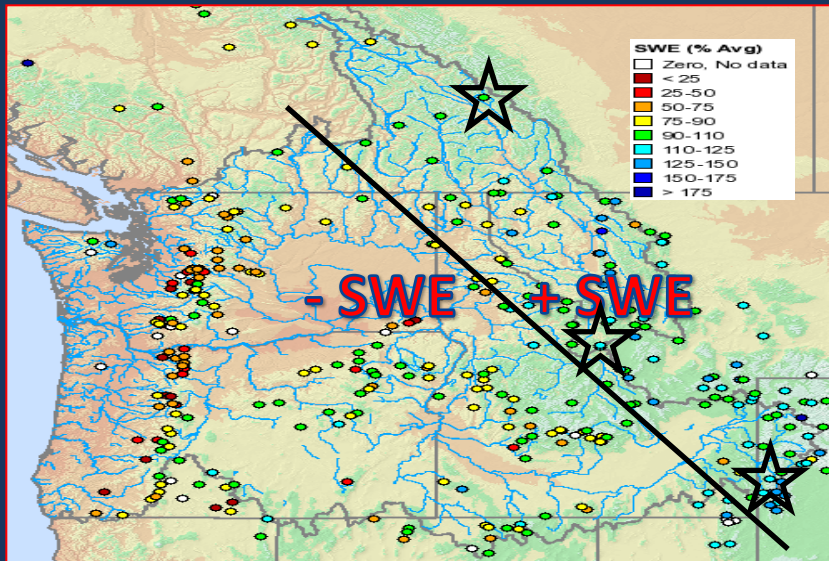


Feb 22, 2011



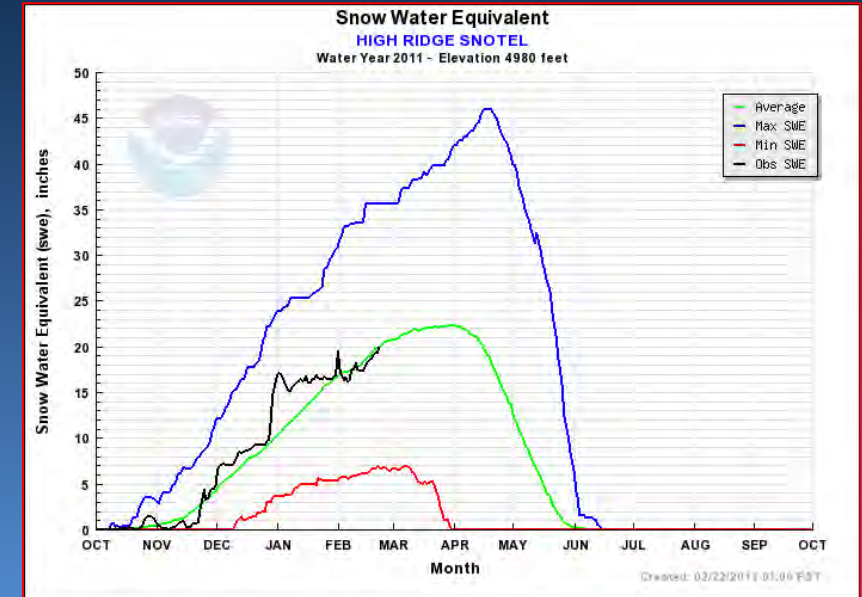
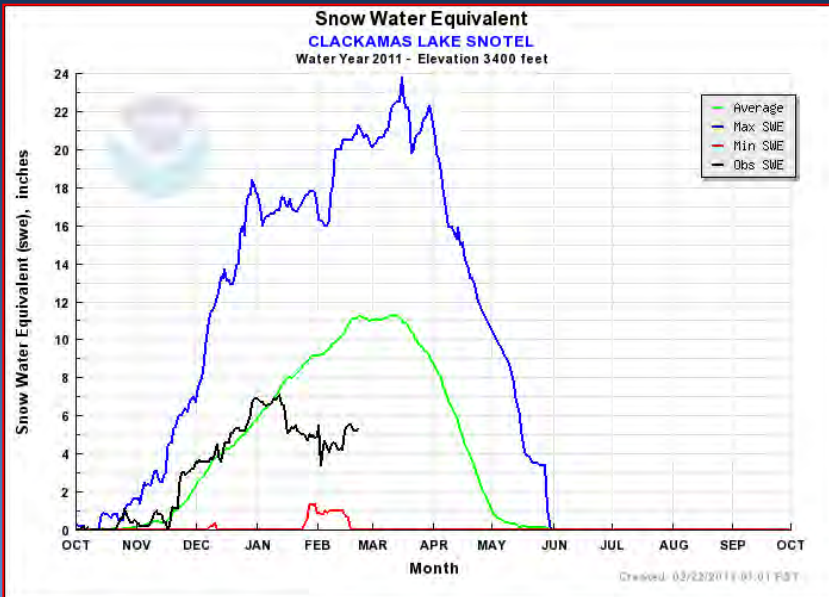
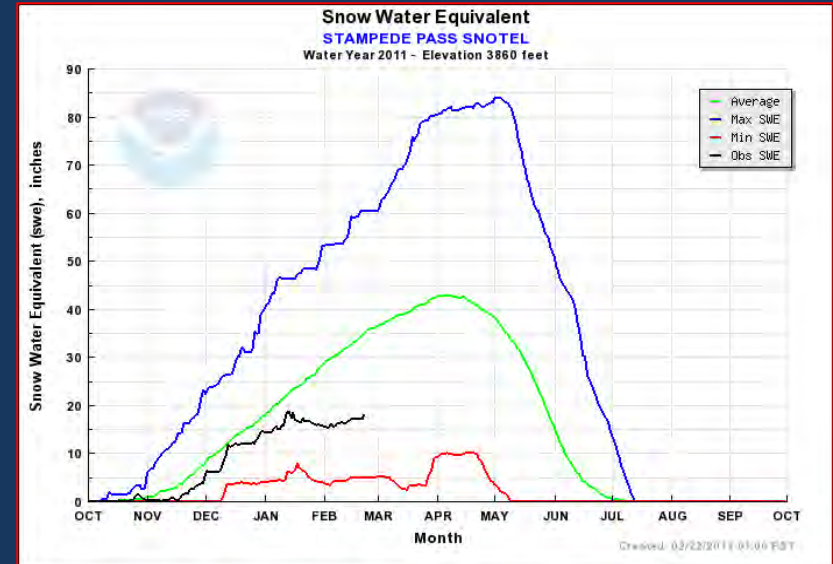
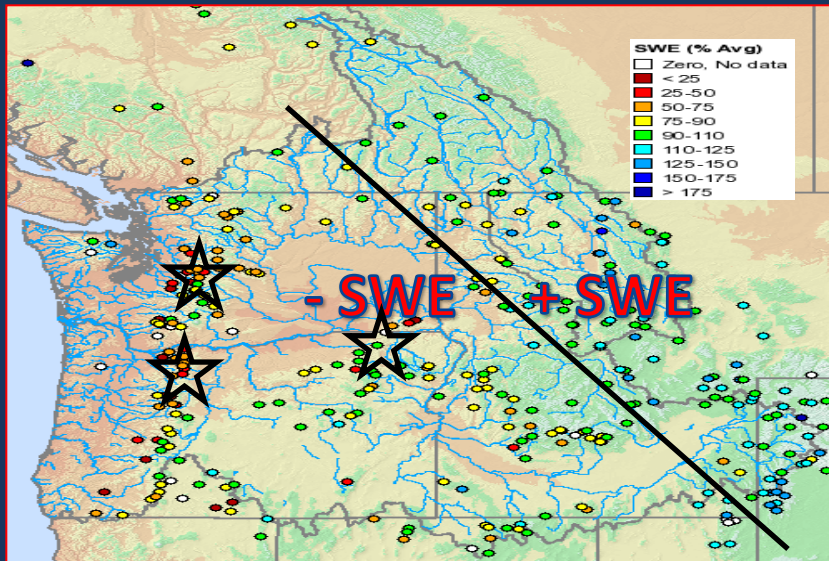


Current Snow Conditions





Current Snow Conditions





Future Conditions



Climate Outlooks

Precipitation Assumptions

Water Supply Forecasts

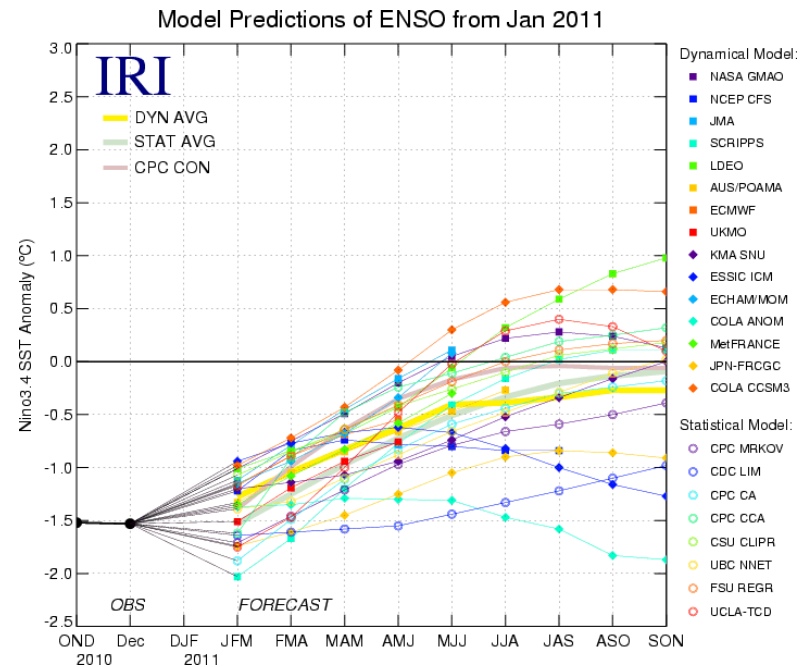
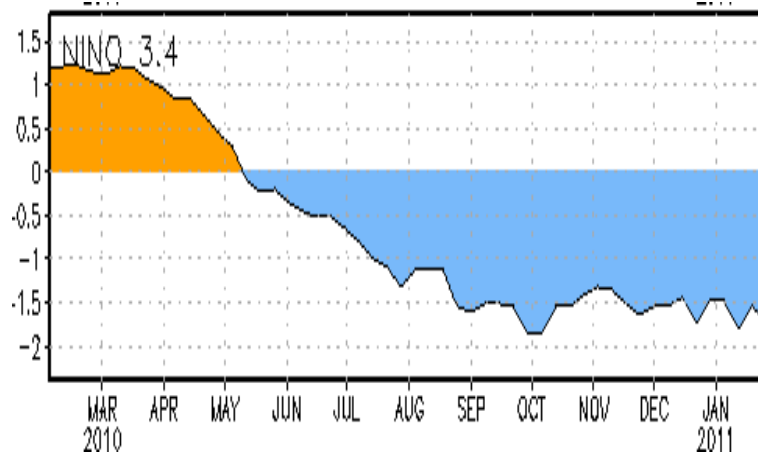


Enso: Observed and Forecast

SST Anomaly (Deg C)



Observed: SST 3.4 ~ 1.0 Deg C



CPC Synopsis: La Niña is expected to continue through spring of 2010.

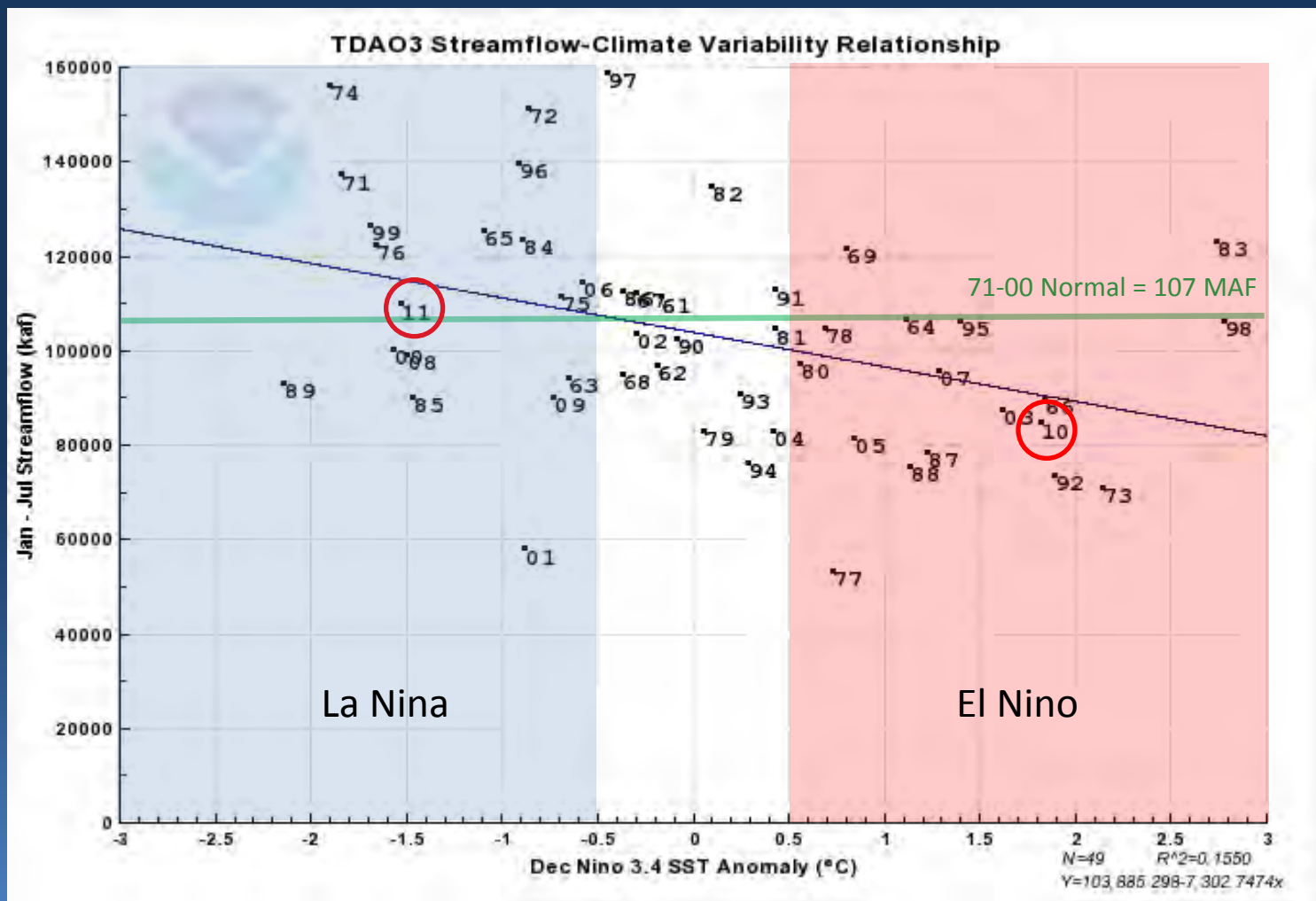
Source: Climate Prediction Center Weekly ENSO Update

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/lanina/enso_evolution-status-fcsts-web.pdf



SST Anomaly vs Streamflow

Columbia River near The Dalles

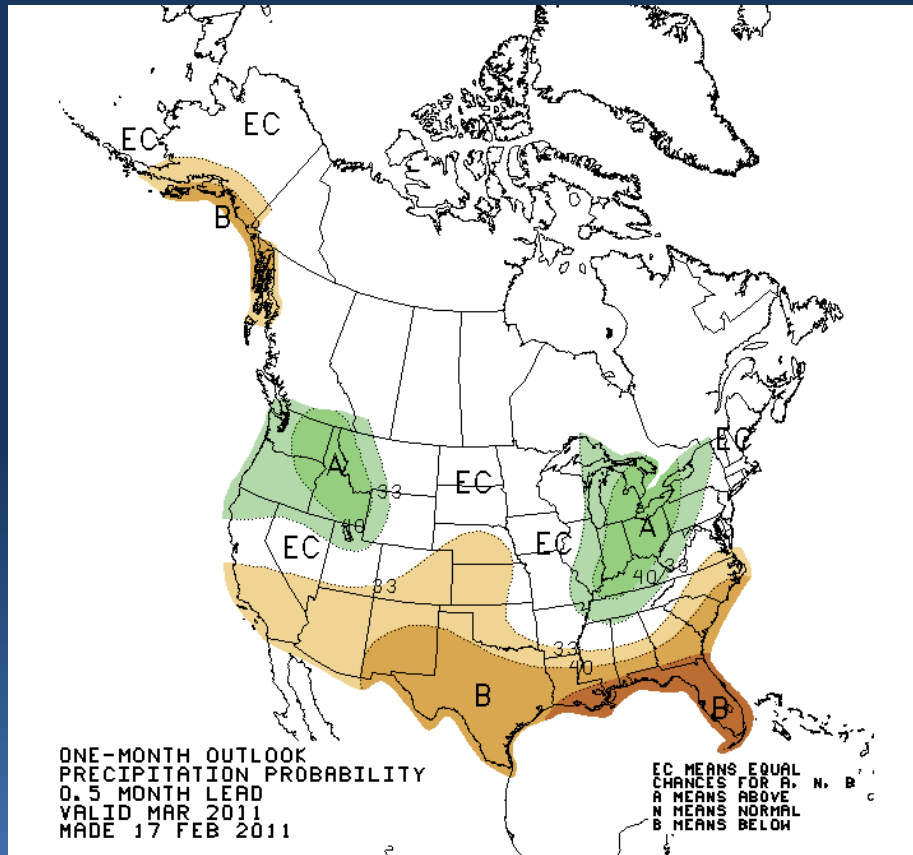




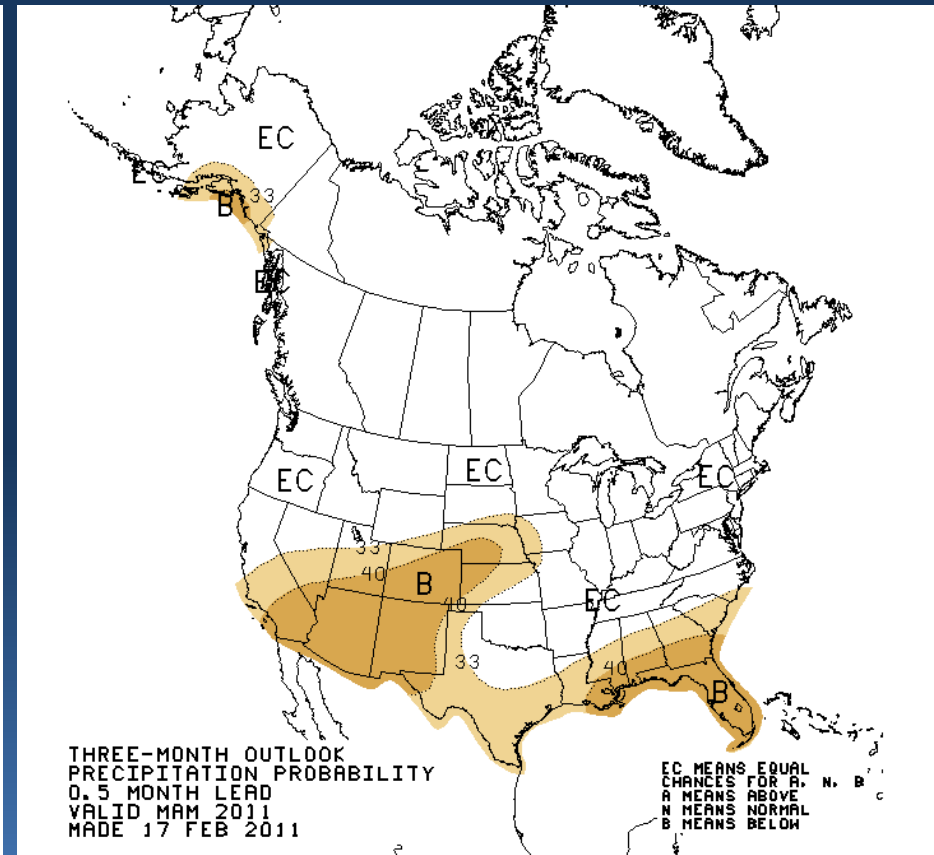
Climate Outlook: Precipitation



Current Month Outlook



Three Month Outlook

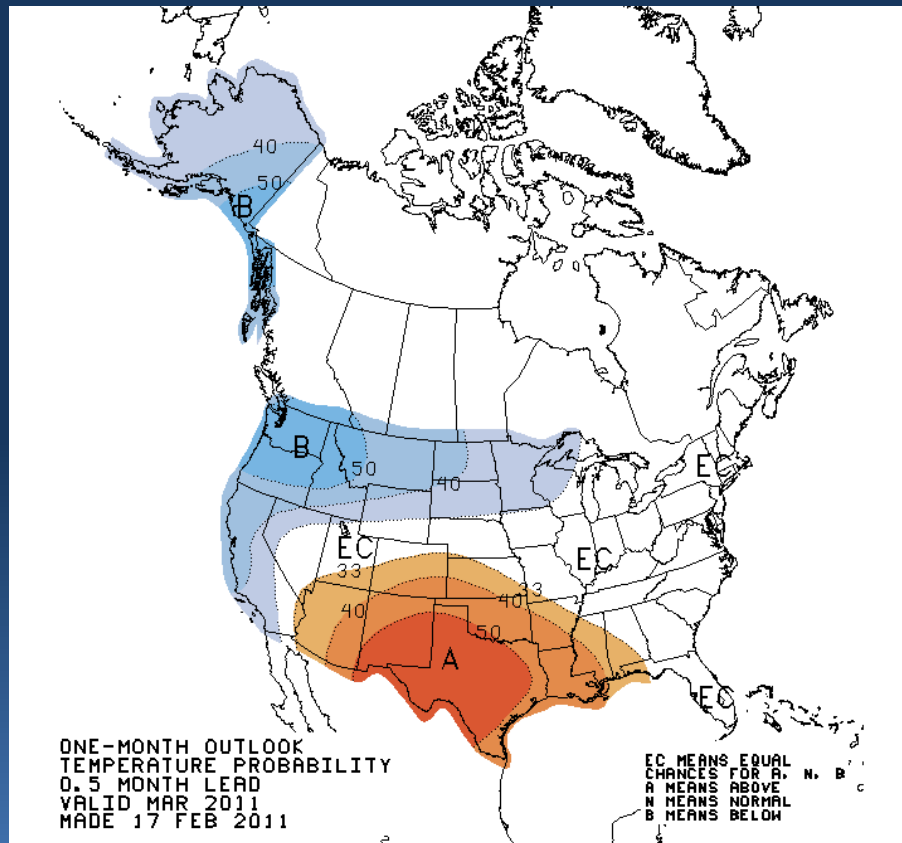




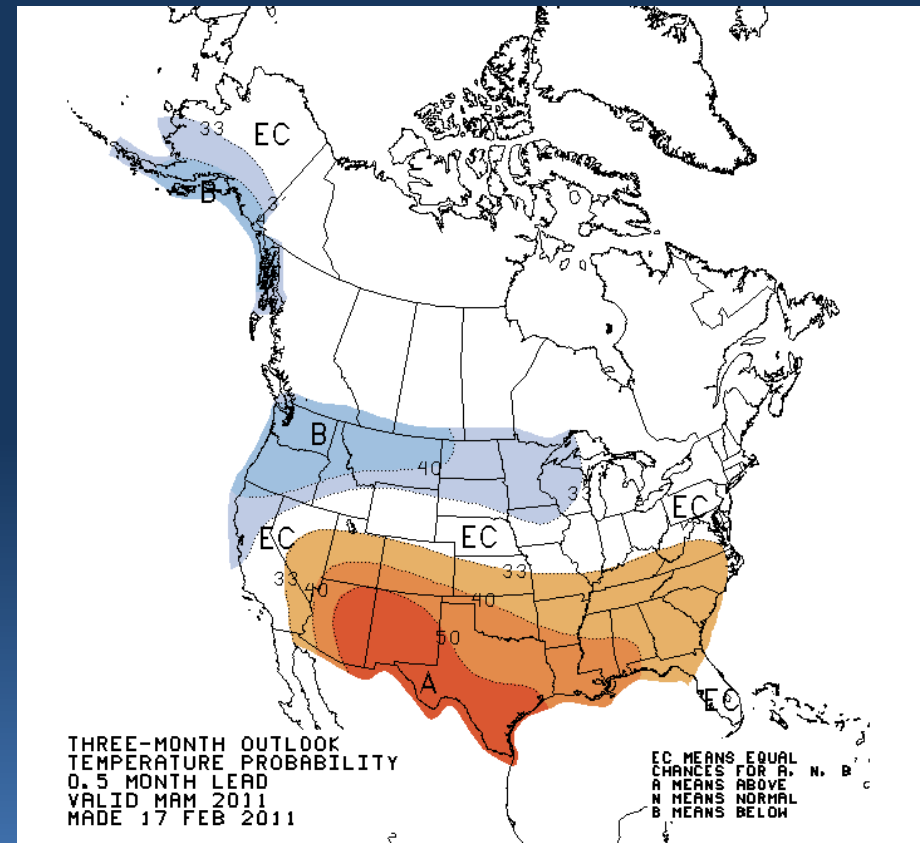
Climate Outlook: Temperature



Current Month Outlook



Three Month Outlook



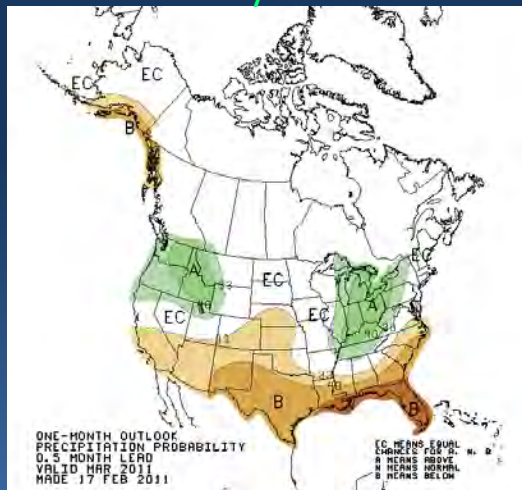


Model Precipitation Assumptions

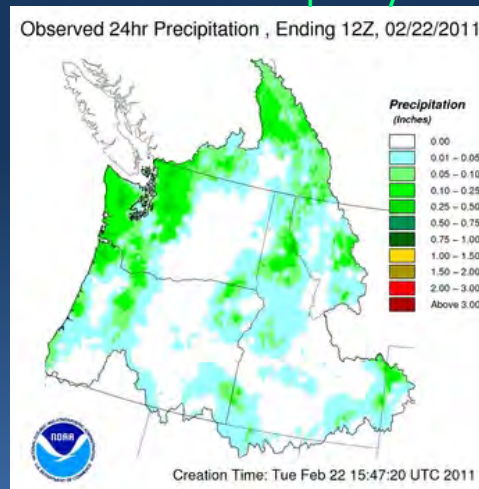
Feb Mid Month Water Supply Forecast:
Future Precipitation 100% of Normal

Assumption based on:

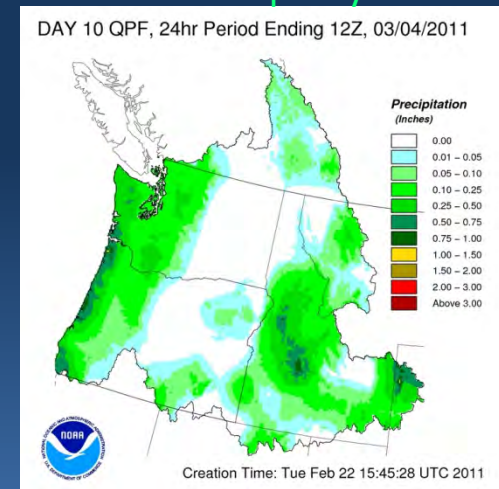
CPC Monthly Outlook



Observed Precip Days 1-5

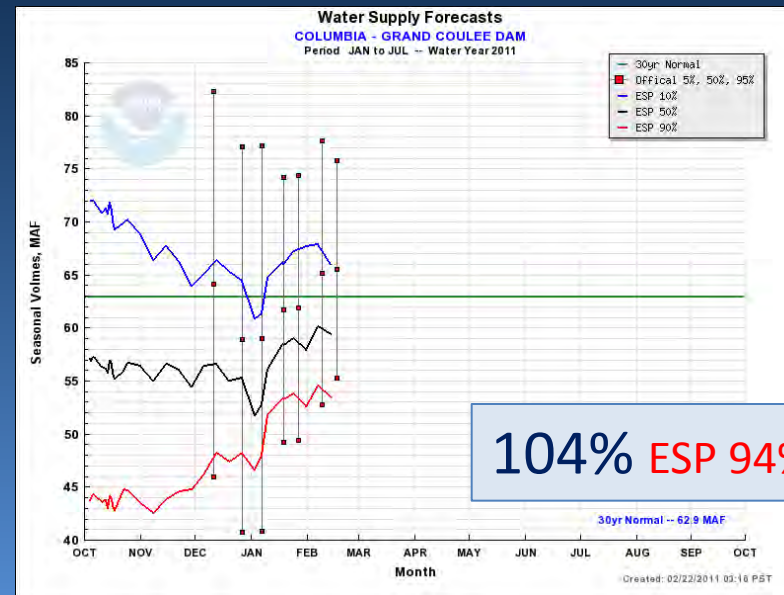
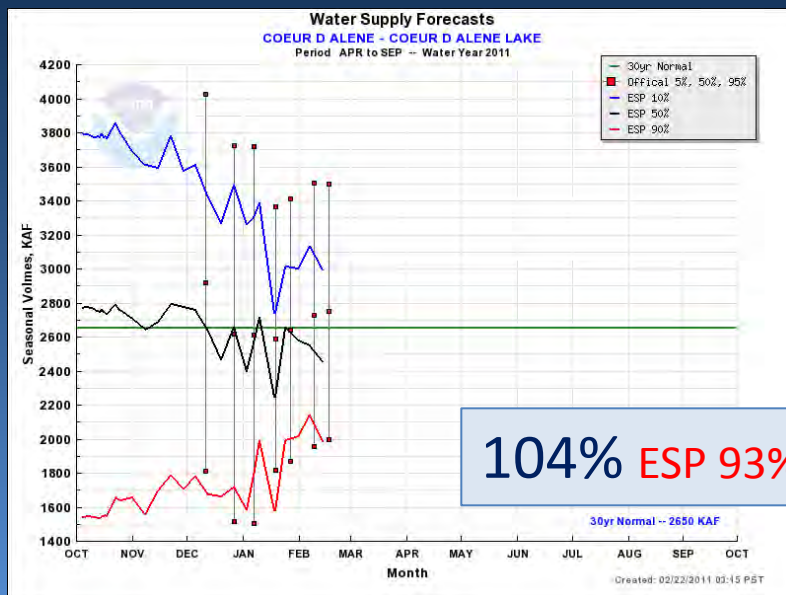
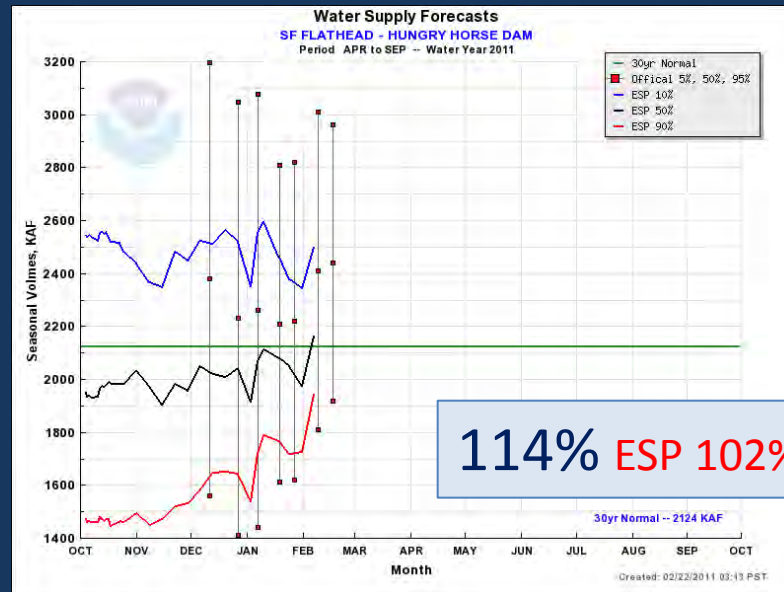
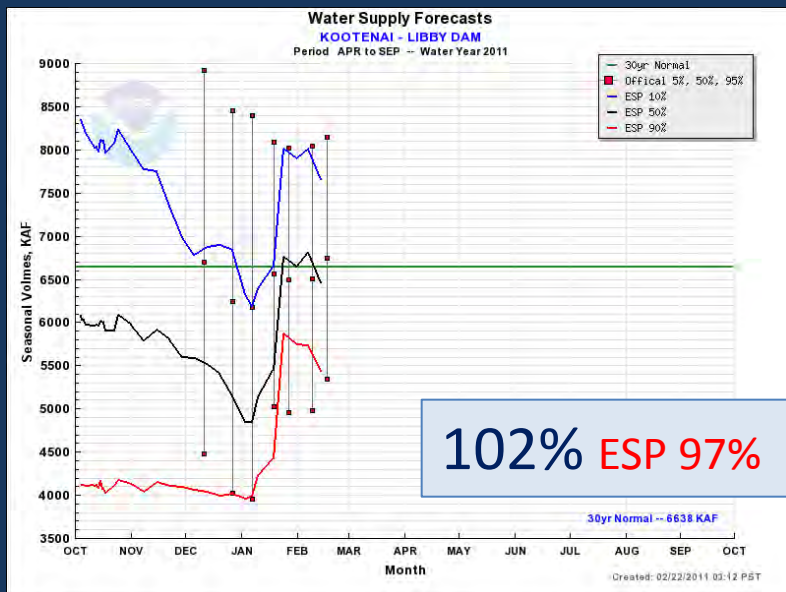


Forecast Precip Days 6-15



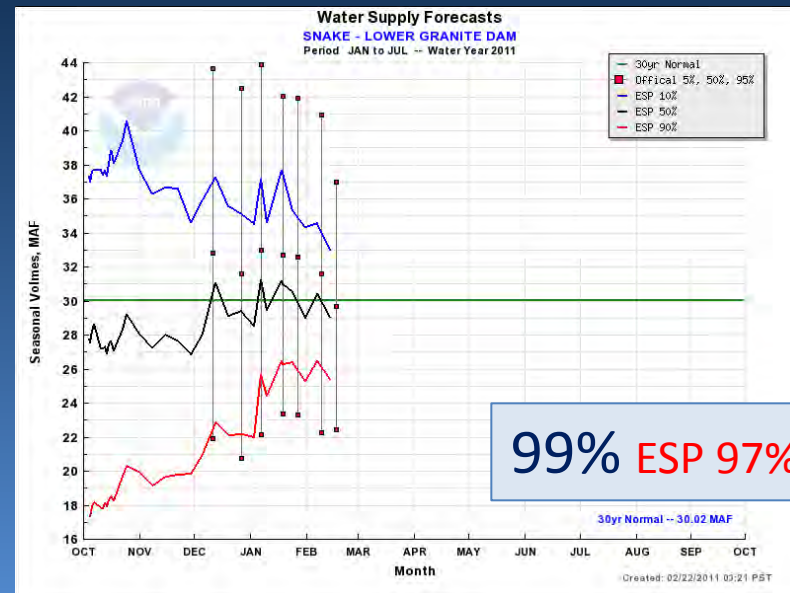
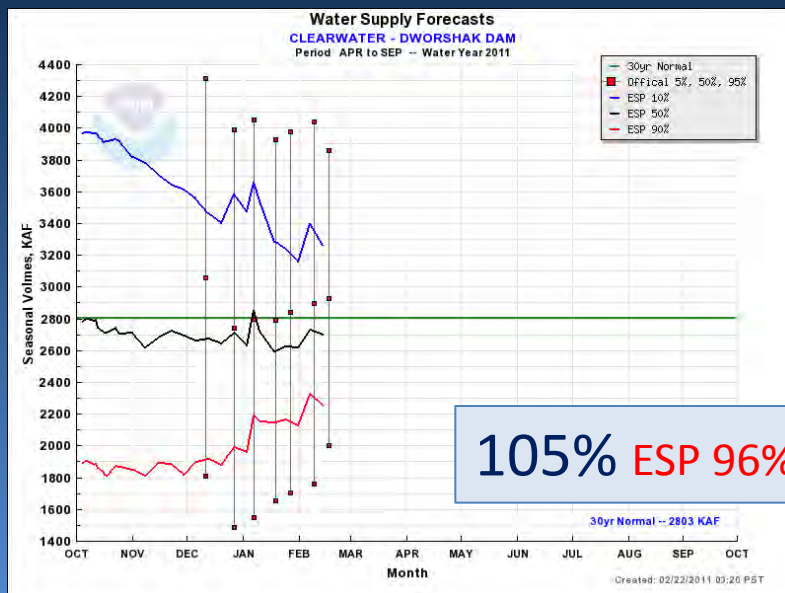
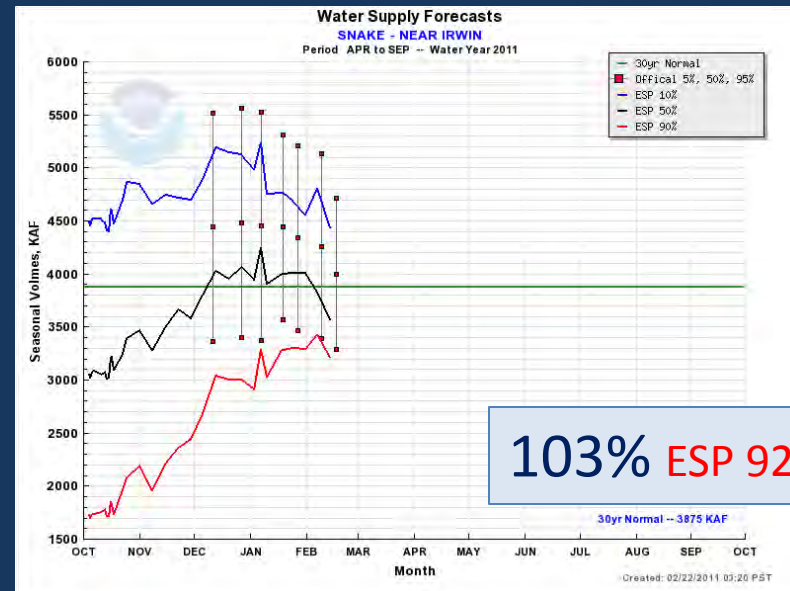
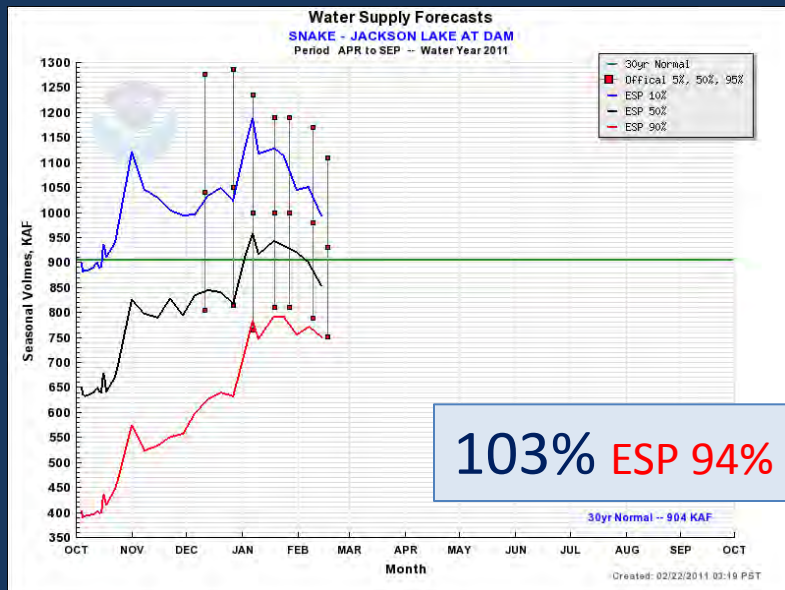


Water Supply Forecast: Upper Columbia



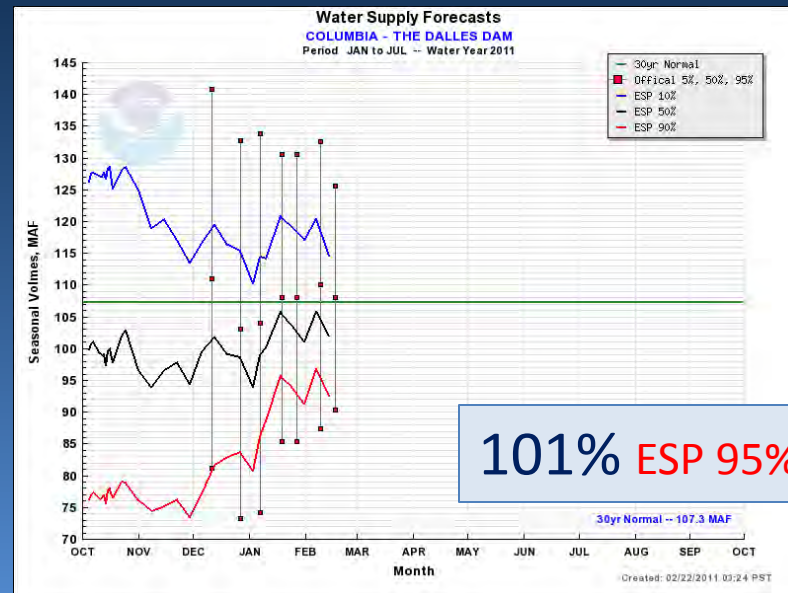
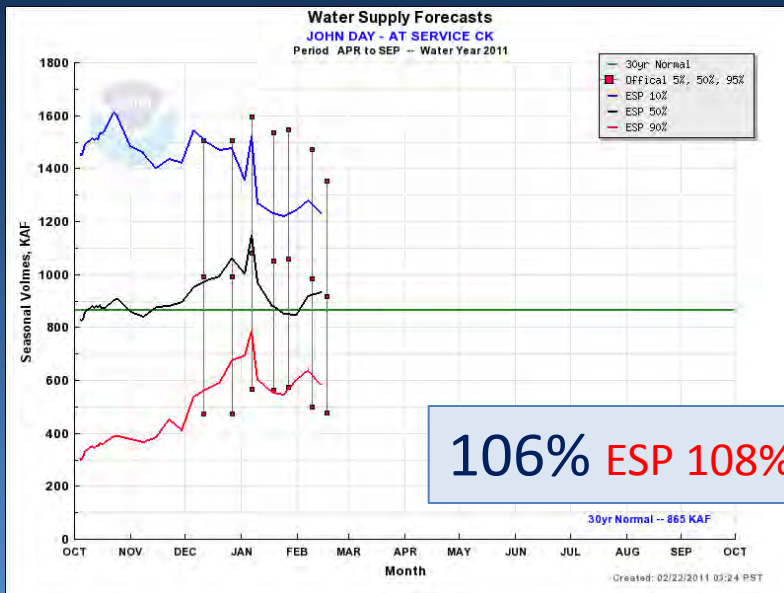
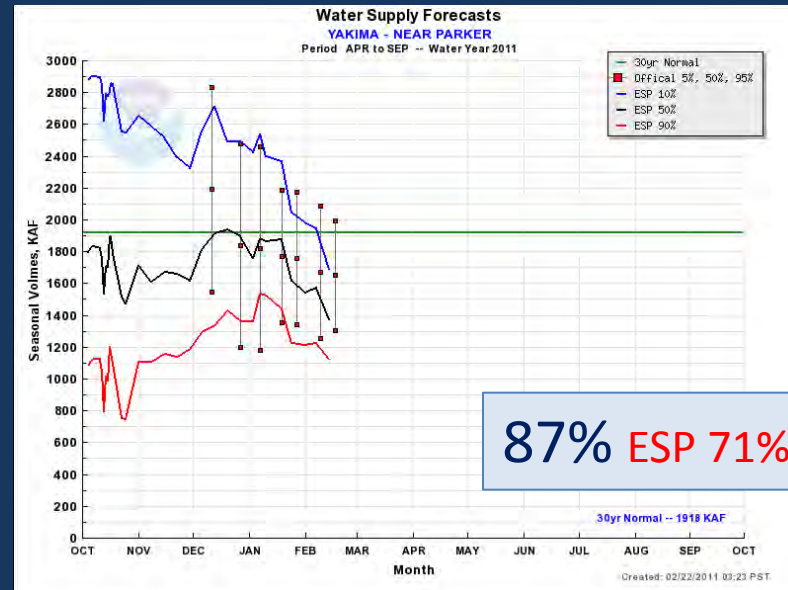
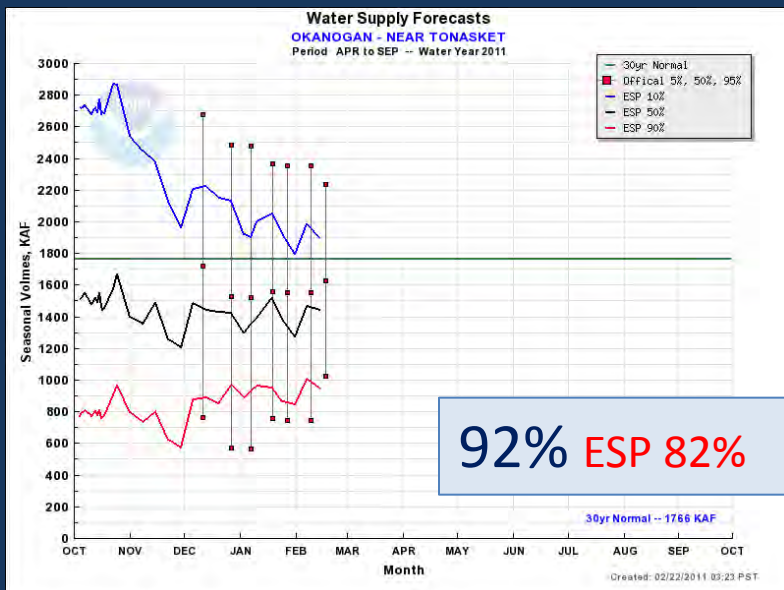


Water Supply Forecast: Snake





Water Supply Forecast: Lower Columbia





Water Supply Forecast: ESP Comparison



COLUMBIA - GRAND COULEE DAM (GCDW1)

Forecasts for Water Year 2011

Official Water Supply Forecast <i>Issued: 2011-02-17</i>					ESP Water Supply Forecast <i>Issued: 2011-02-14</i>				
Forecast Period	Forecasts Are in KAF				Forecasts Are in KAF				30 Year Normal
	95 %	50 %	% Normal	05 %	90 %	50 %	% Normal	10 %	
APR-SEP	55644	65900	103	76156	53239	60954	95	65925	63990
APR-JUL	45144	55400	103	65656	44279	49980	93	56181	53850
APR-AUG	51844	62100	103	72356	49924	56758	94	62270	60290
JAN-JUL	55244	65500	104	75756	53443	59335	94	65988	62900

SNAKE - LOWER GRANITE DAM (LGDW1)

Forecasts for Water Year 2011

Official Water Supply Forecast <i>Issued: 2011-02-17</i>					ESP Water Supply Forecast <i>Issued: 2011-02-14</i>				
Forecast Period	Forecasts Are in KAF				Forecasts Are in KAF				30 Year Normal
	95 %	50 %	% Normal	05 %	90 %	50 %	% Normal	10 %	
APR-SEP	16230	23500	97	30770	19323	23027	95	26998	24140
APR-JUL	13730	21000	97	28270	17012	20272	94	24028	21550
APR-AUG	15030	22300	98	29570	18231	21730	95	25668	22870
JAN-JUL	22430	29700	99	36970	25374	29066	97	33008	30020

COLUMBIA - THE DALLES DAM (TDA03)

Forecasts for Water Year 2011

Official Water Supply Forecast <i>Issued: 2011-02-17</i>					ESP Water Supply Forecast <i>Issued: 2011-02-14</i>				
Forecast Period	Forecasts Are in KAF				Forecasts Are in KAF				30 Year Normal
	95 %	50 %	% Normal	05 %	90 %	50 %	% Normal	10 %	
APR-SEP	79066	96700	98	114334	82573	92872	94	101722	98650
APR-JUL	65166	82800	98	100434	69744	78607	93	87540	84650
APR-AUG	73566	91200	98	108834	77568	86453	93	96172	93090
JAN-JUL	90366	108000	101	125634	92444	101940	95	114517	107300



NWRFC Water Supply Webpage

www.nwrfc.noaa.gov



Water Supply Forecast Release Schedule for 2011 WY								
Type of Forecast	Month							
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
<i>Early Bird (Prelim Forecast)</i>	30	27	24	31	28		2,30	
<i>Offical Forecast (Final)</i>		7	7	7	7	6	7	8
<i>Peak Flow Forecast</i>		10	8	8	8	9	8	11
<i>Mid-month Update</i>	16	20	17	17	21	19	16	
<i>Live Call</i>		10	8	8	8	9		

Normal Release Time is in the Afternoon on Days Listed



Northwest River Forecast Center Water Supply Period Rankings



[Home](#) | [Previous Page](#)

Select Period:

JAN-JUL

COLUMBIA - THE DALLES DAM (TDA03) Period Rankings - 1970 to 2011 JAN-JUL Normal -- 107300 (KAF)

Rank	Year	Period Volume (KAF)	Percent of Normal	Exceedance Probability*
1	1997	158865.92	148	2.381 %
2	1974	156294.51	146	4.762 %
3	1972	151370.51	141	7.143 %
4	1996	139645.26	130	9.524 %
5	1971	137346.04	128	11.905 %
6	1982	134820.51	126	14.286 %
7	1999	126730.05	118	16.667 %
8	1984	123595.61	115	19.048 %
9	1983	123376.79	115	21.429 %
10	1976	122449.32	114	23.810 %
11	2006	114672.00	107	26.190 %
12	1991	112959.91	105	28.571 %
13	1986	112488.48	105	30.952 %
14	1975	111495.75	104	33.333 %
15	2011	108000.00	101	35.714 %
16	1998	106175.05	99	38.095 %
17	1995	106155.22	99	40.476 %
18	1978	104825.78	98	42.857 %
19	1981	104791.23	98	45.238 %
20	2002	103753.00	97	47.619 %
21	1990	102371.51	95	50.000 %
22	2000	100346.00	94	52.381 %
23	2008	99209.00	92	54.762 %
24	1980	97366.22	91	57.143 %
25	2007	95738.00	89	59.524 %
26	1989	93021.28	87	61.905 %
27	1993	90818.70	85	64.286 %
28	1985	90324.80	84	66.667 %
29	2009	90244.00	84	69.048 %
30	2003	87688.00	82	71.429 %
31	2010	84718.00	79	73.810 %
32	1979	83024.92	77	76.190 %
33	2004	82954.00	77	78.571 %
34	2005	81349.00	76	80.952 %
35	1987	78634.71	73	83.333 %
36	1994	76398.88	71	85.714 %
37	1988	75538.46	70	88.095 %
38	1992	73544.84	69	90.476 %
39	1973	70991.94	66	92.857 %
40	2001	58187.00	54	95.238 %
41	1977	53293.33	50	97.619 %

Ranking tool places current
'official' forecast in historical context

Feb forecast volume for The Dalles:
101% of Normal (Jan-Jul)
Rank of 15 out of 40 years

*Exceedance Probability: The probability that a specific seasonal volume will be exceeded.



Northwest River Forecast Center Water Supply Forecasts



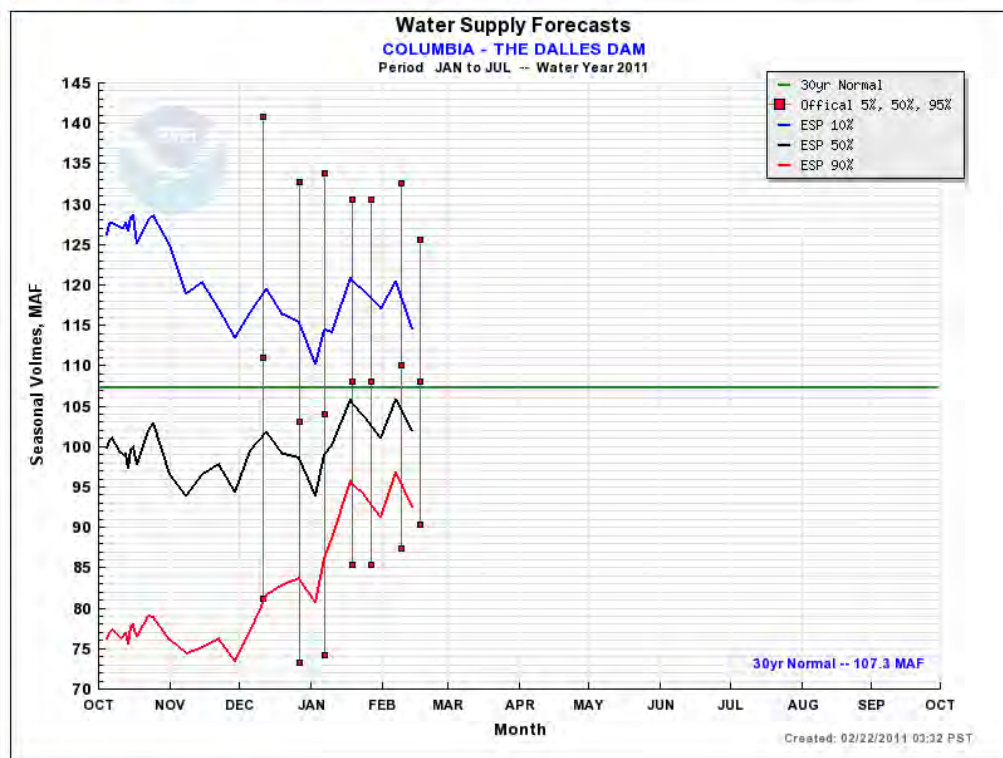
[Home](#) [Previous Page](#) [Archive](#) [Data/Normals](#) [Rankings](#) [Adjustments](#) [Verification](#) [Help](#)

COLUMBIA - THE DALLES DAM (TDA03) Forecasts for Water Year 2011

Official Water Supply Forecast *Issued: 2011-02-17* ESP Water Supply Forecast *Issued: 2011-02-14*

Forecast Period	Forecasts Are in KAF				Forecasts Are in KAF				30 Year Normal
	95 %	50 %	% Normal	05 %	90 %	50 %	% Normal	10 %	
APR-SEP	79066	96700	98	114334	82573	92872	94	101722	98650
APR-JUL	65166	82800	98	100434	69744	78607	93	87540	84650
APR-AUG	73566	91200	98	108834	77568	86453	93	96172	93090
JAN-JUL	90366	108000	101	125634	92444	101940	95	114517	107300

Move the mouse over the desired "Forecast Period" to display a graph.



For Data Used In Plot Click Here: [CSV](#)

Added Functionality:

Mouse over on Forecast Period date
to create graphic for that period



Northwest River Forecast Center Monthly Runoff Information



[Home](#) | [Previous Page](#)

COLUMBIA - THE DALLES DAM (TDA03) Seasonal Volume Normals in KAF

	Apr-Sep	Apr-Jul	Apr-Aug	Jan-Jul
30-Year Normal 1971-2000	98649.17	84649.44	93085.93	107302.05
Estimated** 30-Year Normal 1981-2010	92401.55	79619.50	87274.85	100970.51

* Filled Monthly Total
** Provisional data beyond WY 2000

COLUMBIA - THE DALLES DAM (TDA03) Month Volumes in KAF												
Calendar Year	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1970										4735.71	4517.81	5172.55
1971	9161.20	9772.71	8382.09	16270.33	39075.68	37333.09	19360.45	10116.14	5635.70	5587.12	5590.24	5003.43
1972	8532.97	7969.03	16204.57	15067.25	34723.96	48587.48	21590.24	10824.00	5955.18	3791.83	4771.50	3587.18
1973	5834.75	4187.02	6313.92	7190.81	18847.75	18268.33	10642.55	6400.68	4343.79	4290.28	5840.88	8745.47
1974	13257.27	8428.42	10545.37	20183.37	29779.03	49483.36	24319.69	19432.12	5482.52	6436.17	4229.47	4417.64
1975	5294.25	4695.56	7482.53	10002.62	26457.48	36434.48	21128.53	8706.04	6038.42	6144.35	7112.90	11241.50
1976	8128.80	6653.97	7693.11	16528.25	35897.85	26908.49	20738.36	14298.12	8721.20	5178.17	4238.49	3855.99
1977	3542.07	3241.50	3597.18	7154.25	13003.15	14829.65	7365.60	6668.00	4580.68	3968.60	4270.82	8516.48
1978	5654.19	5172.53	4251.06	15253.89	24145.86	27000.48	11262.55	8041.19	7772.63	5315.99	4747.53	3495.50
1979	5755.31	6166.34	8007.63	10032.99								
1980	4822.15	5000.05	6310.00	14702.58								
1981	7854.15	7929.15	7443.73	10944.24								
1982	5646.55	11575.07	12701.40	13440.87								
1983	7984.77	8607.80	15481.84	16220.00								
1984	3974.39	7237.88	11958.89	19862.59								
1985	4931.75	4791.21	6374.11	19338.04								
1986	5289.81	9969.27	75821.10	16500.76								
1987	4308.94	4491.34	8900.59	12154.85								
1988	3894.08	3701.88	8758.80	13118.24								
1989	4249.38	3651.01	9191.91	16425.09								
1990	6045.66	4902.60	7085.07	16141.92								
1991	6148.71	7966.72	7149.11	13025.50								
1992	4719.01	5845.90	7781.82	11026.87								
1993	4084.97	3527.02	8636.74	12722.84								
1994	4269.04	3429.81	8124.55	13839.49								
1995	5642.40	9717.05	11258.63	10664.01	24926.09	18822.62	18863.06	8586.46	5093.07	6429.57	76198.71	14289.07
1996	9126.38	15882.10	12349.74	20488.89	27195.22	34415.17	20098.71	8918.99	5487.74	5240.78	5281.29	6384.90
1997	11523.41	9511.19	14485.23	19814.38	41895.03	41278.62	20257.15	9651.01	7042.93	9230.13	7088.18	5771.34
1998	8189.88	5308.15	9290.20	15286.64	33370.80	23823.73	13695.64	7267.52	5128.37	4316.12	5181.56	6406.15
1999	7909.33	1096.79	12331.12	15364.82	26391.64	35910.92	21925.93	12501.67	5728.78	5203.68	6492.30	7499.40
2000	9896.57	6891.89	9103.82	17426.67	22380.28	22380.73	14897.02	7360.96	5592.28	4843.00	5718.00	2822.00
2001	2002.00	2388.00	4504.00	6614.00	17878.00	13806.00	9227.00	5575.00	3463.00	3427.00	4612.00	4208.00
2002	5572.00	4658.00	6761.00	18697.00	22900.00	38489.00	17288.00	6272.00	4290.00	3304.00	3372.00	3536.00
2003	4797.00	5663.00	19102.00	13060.00	20827.00	24603.00	9930.00	5542.00	3670.00	5978.00	4632.00	4366.00
2004	4426.00	4983.00	7977.00	13765.00	20814.00	19909.00	11074.00	7401.00	7108.00	5602.00	5408.00	6664.00
2005	7120.00	5594.00	6349.00	10528.00	21609.00	18708.00	11615.00	5866.00	4280.00	6167.00	4067.00	5052.00
2006	8928.00	5184.00	8095.00	18338.00	34785.00	27714.00	11697.00	5689.00	4031.00	2994.00	7265.00	5615.00
2007	5205.00	5357.00	12058.00	18777.00	33815.00	22828.00	13655.00	5826.00	3372.00	4704.00	4469.00	4842.00
2008	4042.00	4078.00	5924.00	7129.00	51292.00	30884.00	15860.00	8033.00	4715.00	4628.00	5794.00	4300.00
2009	6310.00	3165.00	8413.00	12001.00	23943.00	25281.00	11690.00	7386.00	4783.00	4229.00	4864.00	3938.00
2010	4869.00	4134.00	5325.00	9739.00	17687.00	29041.00	13923.00	7021.00	5577.00	8247.00	7323.00	8334.00
2011	12387.00											
30 Year Normal 1971-2000	6313.36	6762.88	9576.38	14174.55	26688.98	27978.68	15807.22	8436.50	5563.24	5086.62	5617.43	6051.67
Estimated** 30-Year Normal 1981-2010	5907.39	6335.30	9048.32	13738.40	25231.38	26158.21	14491.51	7655.34	5126.71	5002.16	5618.15	5556.50

Update to the Runoff

- Filled in missing data
- Added normals for
- Added estimated '8

Update to the Runoff Data/Normals page:

- Filled in missing data for WY 2001
- Added normals for forecast periods
- Added *estimated* '81-'10 normal

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday March 9, 2011 9:00am - 12:00pm

**1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)**

CONFERENCE CALL INFORMATION

**Phone Number (877) 336-1274
Access Code 3871669**

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review February 23 Meeting Minutes [\[Meeting Minutes\]](#)
3. Chum Emergence Model - Dennis Schwartz, COE-NWP
 - a. [Emergence Model](#)
4. Water Supply Forecast Update- Steve Barton, COE-NWD
 - a. [Westwide SNOTEL](#)
5. Dworshak Update - Steve Barton, COE-RCC and Steve Hall, COE-NWW
6. 2011 Fish Operations Plan - Dan Feil, COE-NWD
 - a. [Oregon Comments on the 2011 Draft FOP](#)
 - b. [Oregon Response to 2011 JDA Spill Proposal](#)
7. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System

- d. Water Quality
- 8. Other
 - a. Set agenda and date for next meeting - **March 23, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

Development of a Conceptual Chum Salmon Emergence Model for Ives Island

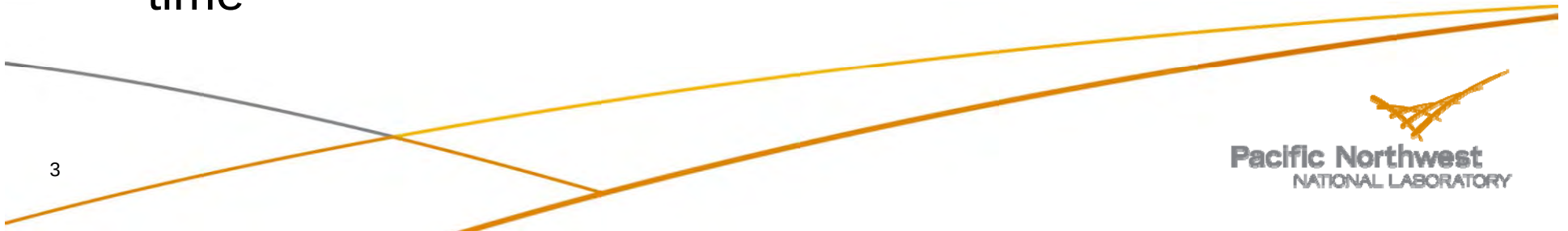
Chris Murray, David Geist, Evan Arntzen, Yi-Ju Bott, and Marc Nabelek

Introduction

- ▶ Estimation of timing of chum salmon emergence below Bonneville Dam would be useful to system operators
 - Want to estimate complete distribution of emergence, e.g., estimation of first emergence, 50% emergence, 80%, etc.
 - Would provide valuable information that could be used in balancing chum redd protection and power system operation
- ▶ PNNL has developed a procedure to predict emergence times of individual redds in Ives Island spawning area
- ▶ Talk will include
 - Conceptual basis for the prediction method
 - Approach and case study for 2009-2010 chum redds

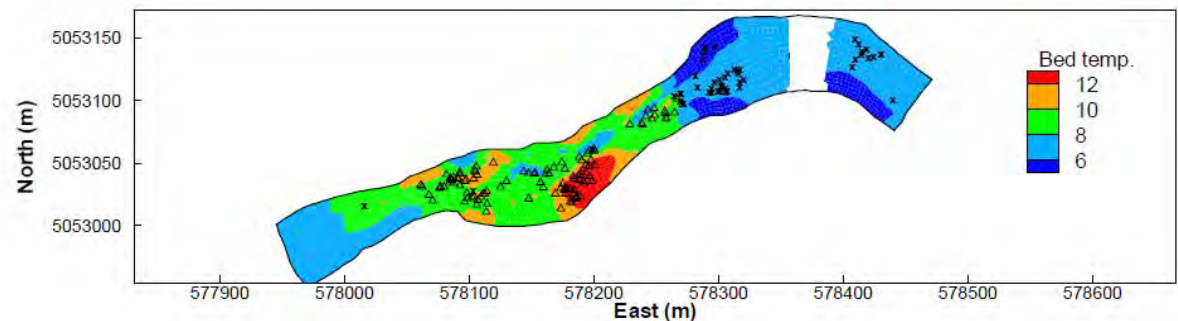
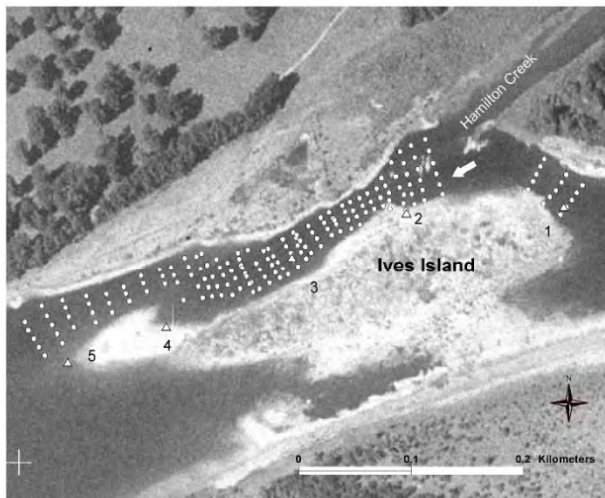
Conceptual Model Assumptions

- ▶ Days to emergence for a given chum salmon redd can be predicted from estimates of hyporheic temperature
 - Laboratory studies by PNNL suggest thermal threshold of 932 accumulated thermal units (ATUs) at 50% emergence
 - ATU calculated as sum of daily average temperature from a given start date, here the date of spawning
- ▶ Spatial interpolation of days to emergence from point data can be used to predict days to emergence at unsampled locations
- ▶ Patterns of warm and cool hyporheic temperatures near Ives Island have been found to be relatively constant over time



Spatial Distribution of Hyporheic Temperature

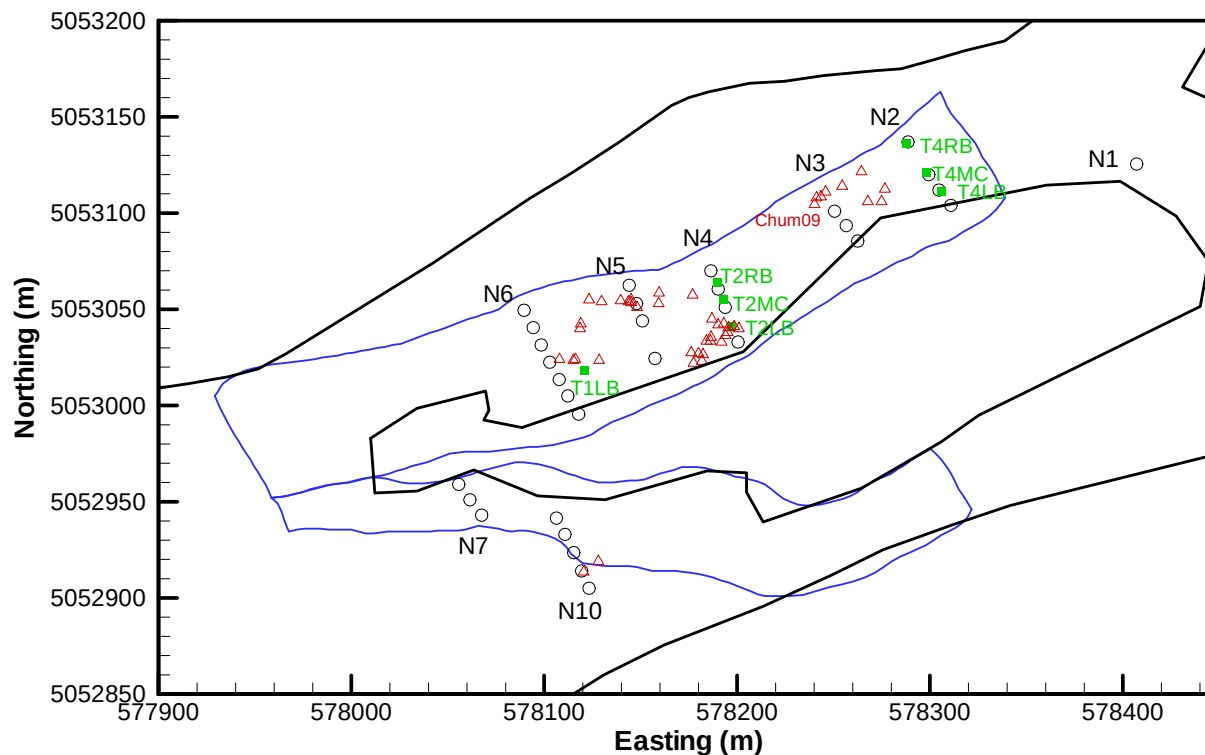
- ▶ Warmer hyporheic temperatures found in western portion of Ives Island channel, associated with chum spawning
 - Geist et al. 2002*



*Geist et al. 2002. Physicochemical characteristics of the hyporheic zone affect redd site selection of chum and fall Chinook salmon, Columbia River. NAJFM 22:1077-1085.

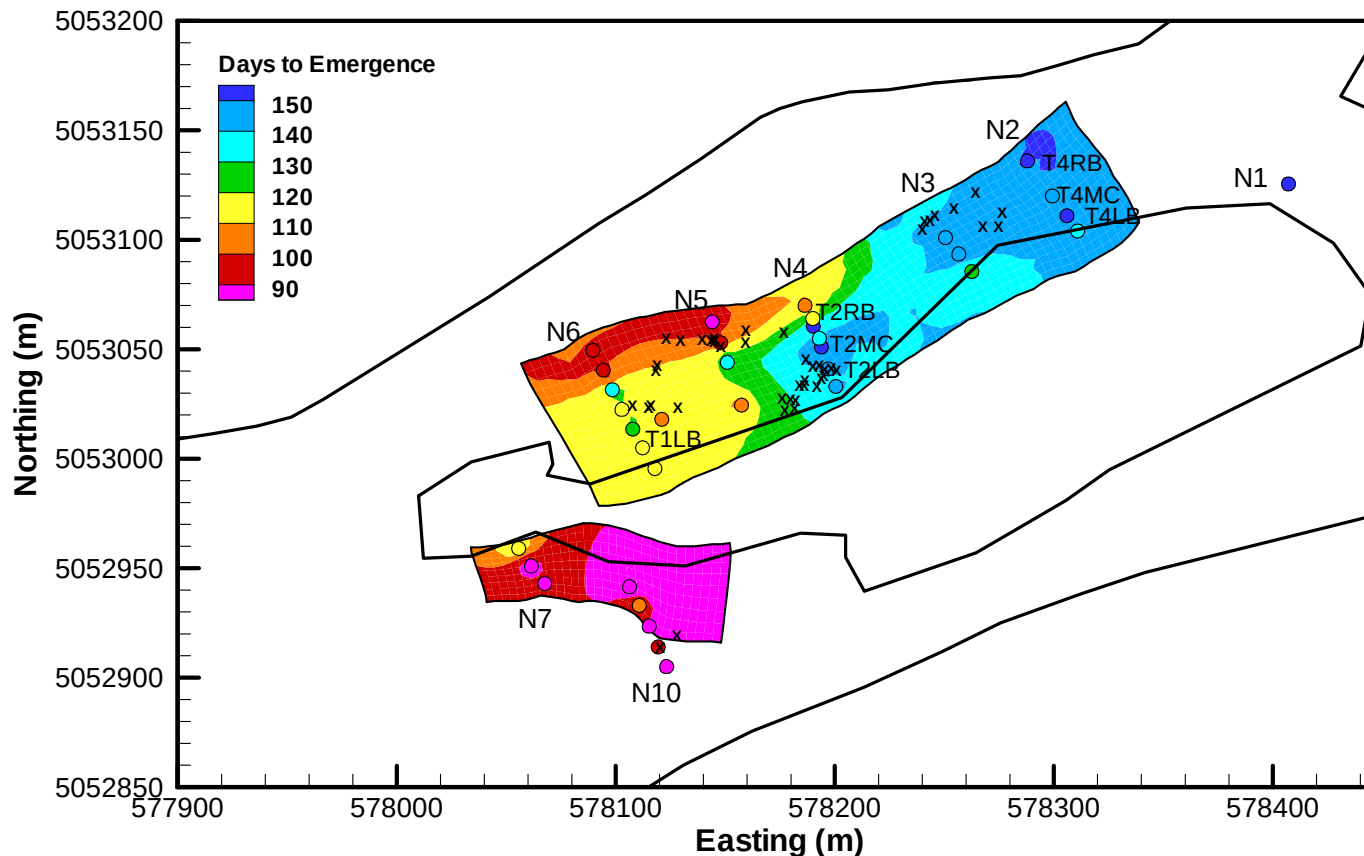
Locations of Hyporheic Bed Temperature Sensors for 2006-2007

- ▶ 2006-2007 had dense distribution of sensors with hourly record of hyporheic temperature over full incubation season
 - Onset loggers at 31 locations, 3 real time sensors, and 4 other locations with hyporheic temperature sensors



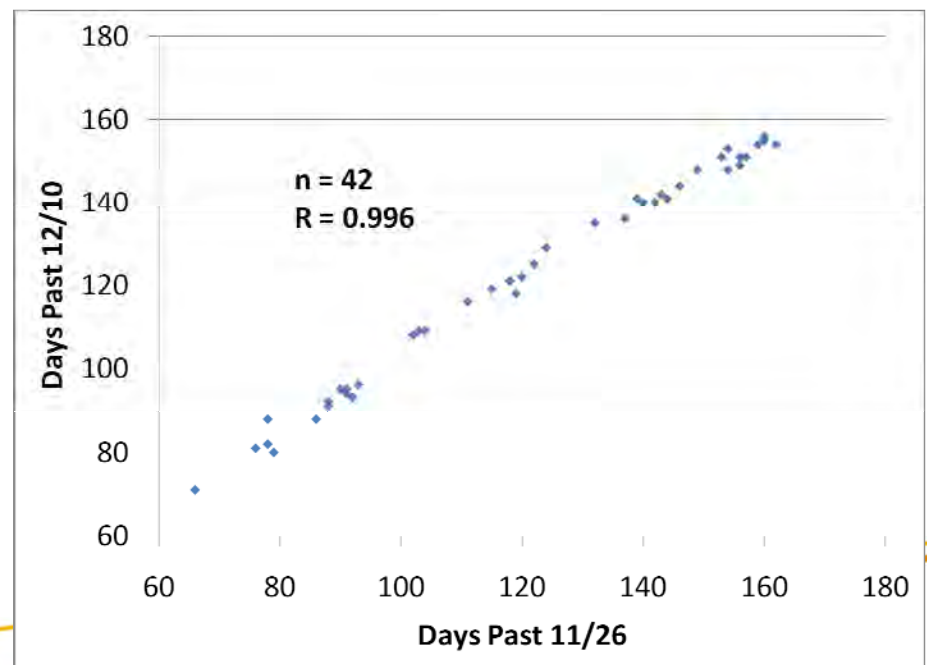
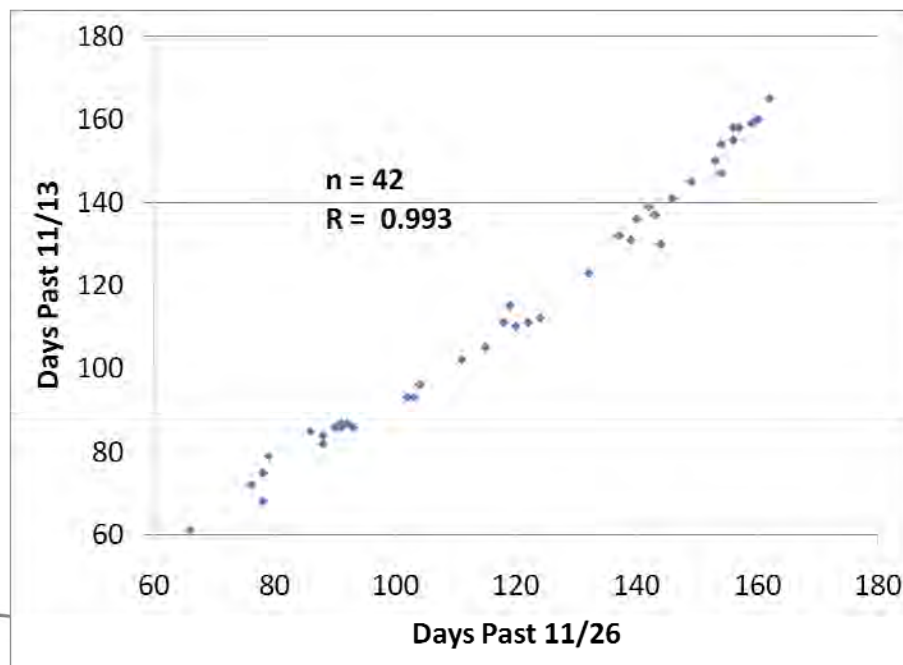
Map of Estimated Days to Emergence for 2006-2007

- ▶ Calculated ATUs for each sensor location, calculated days to emergence, and interpolated using standard mapping algorithms
- ▶ Higher hyporheic temperatures in western portion of study area, similar to Geist et al. 2002, leads to earlier emergence in that area



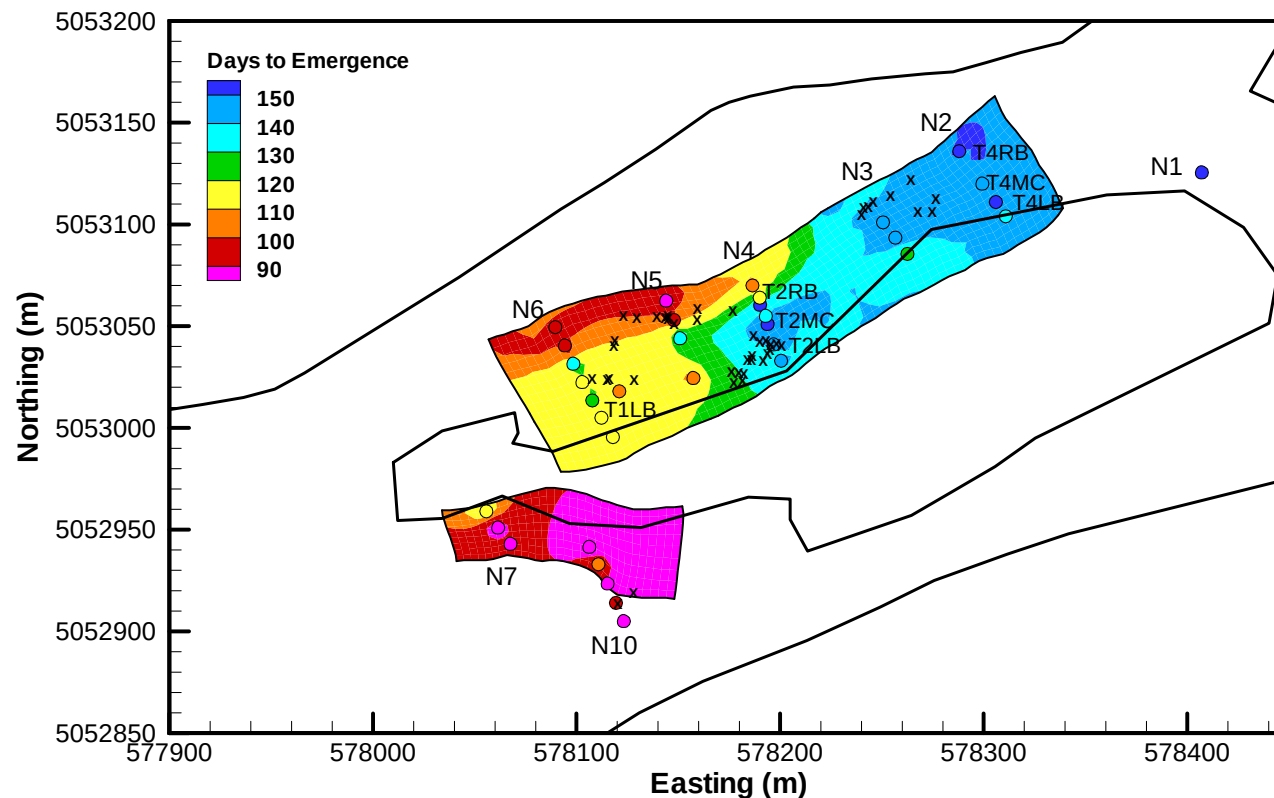
Spatial Pattern of Hyporheic Temperature Constant within a Given Incubation Season

- ▶ High correlation between days to emergence calculated using spawning dates associated with formation of 10th, 50th, and 90th percentiles of redds
 - One month spread in initiation dates



Pre-Season Estimate 2009-2010 Redds

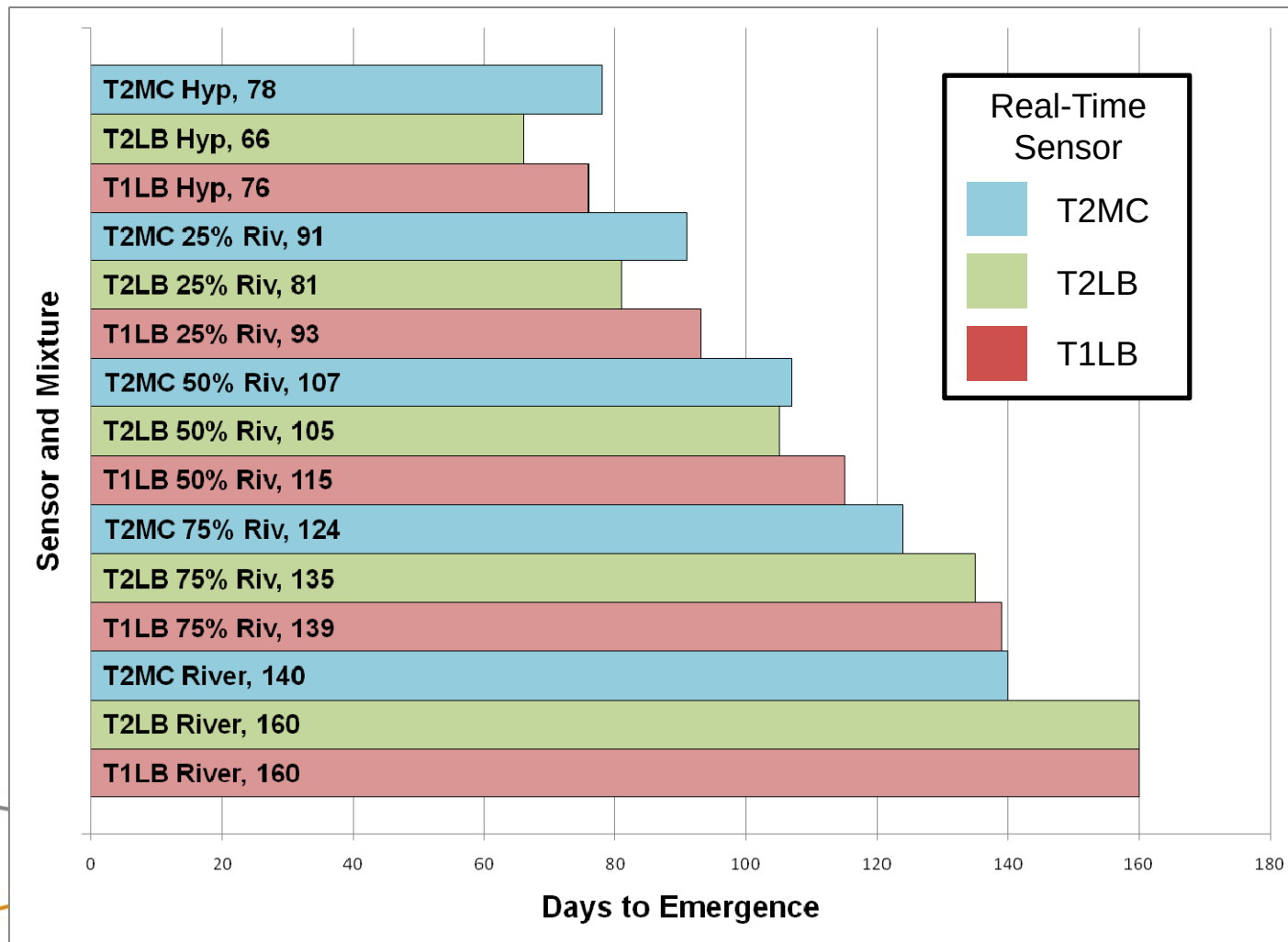
- ▶ Map location and record spawning dates for each chum redd at end of spawning period
- ▶ For each redd location, interpolate days to emergence from 2006-2007 map, add to spawning date



	Pre-season
Earliest	3/1/2010
10%	3/11/2010
50%	4/8/2010
90%	4/23/2010

Conceptual Model for Use of Real-Time Data for Adjusting Estimated Days to Emergence

- ▶ Mixtures of hyporheic and river water from 3 real-time locations span range of estimates for 2006-2007 Ives Island egg pocket sensor locations
- ▶ Use proxy mixture curve for closest value of days to emergence



In-Season Update of Emergence Estimates

- ▶ Identify sensor and mixture of groundwater and river water associated with days to emergence
 - Interpolated days to emergence determined from 2006-2007 map for pre-season estimate
 - Search in table of days to emergence for sensors and mixtures to find closest match
- ▶ Calculate ATUs for each redd
 - Use appropriate sensor and mixture from real time system data and spawning date as start date
 - Emergence date found when ATUs exceed 932 for given redd
- ▶ Estimate dates for population of redds
 - Date of first emergence
 - Dates when 10%, 50%, and 90% of redds should reach 932 ATUs
- ▶ Compensates for differences in river or hyporheic temperature from year to year

Comparison of Pre-Season and In-Season Estimates for 2009-2010 Chum Redd Locations

- ▶ Pre-season estimate from linear interpolation of days to emergence on 2006-2007 map, added to spawning date
- ▶ In-season estimate used 2009-2010 real time hyporheic and river temperature data
 - Mixture for each redd determined from closest match of interpolated days to emergence
- ▶ In-season estimates are at least 1-2 weeks earlier
 - Warmer river temperatures from mid-January through the end of March in 2010

	Pre-Season	In-Season
Earliest	3/1/2010	2/10/2010
10%	3/11/2010	3/4/2010
50%	4/8/2010	3/25/2010
90%	4/23/2010	4/9/2010

Summary

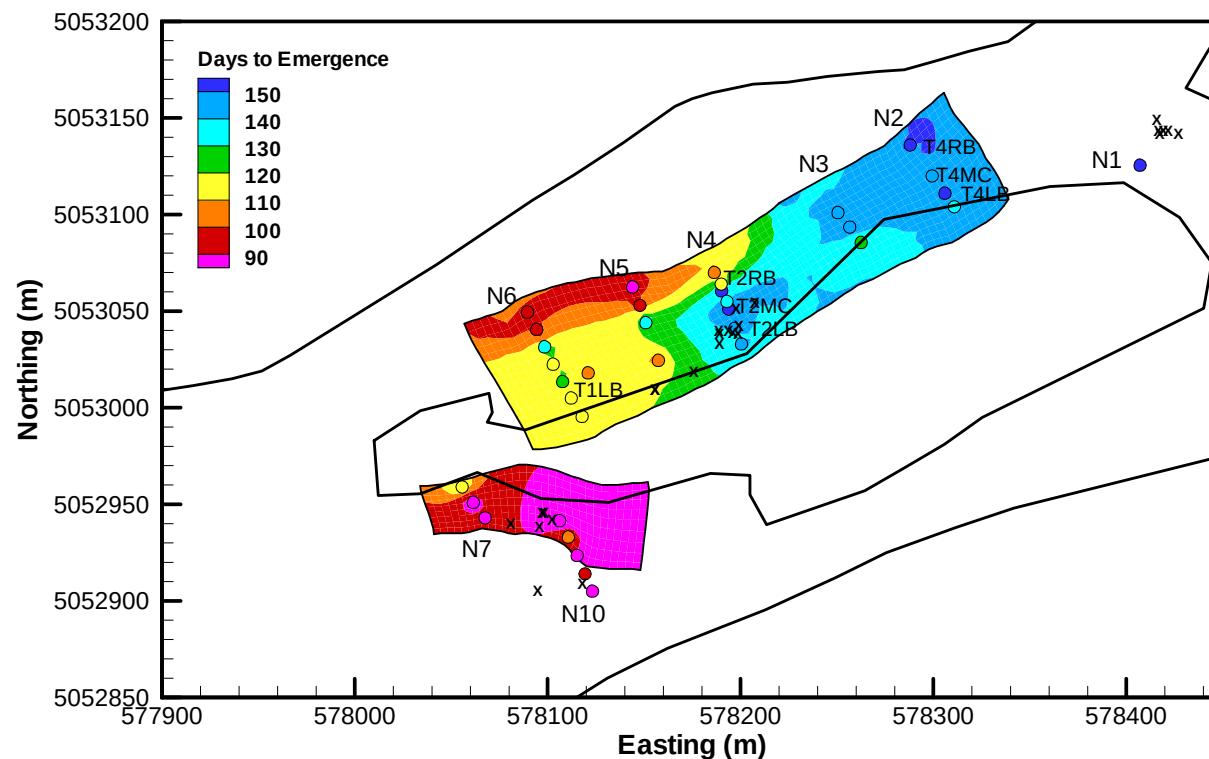
- ▶ Model developed to predict range of chum emergence dates for portion of Iles Island area with highest spawning density
 - Full temporal distribution based on individual redd locations and spawning dates
 - Will provide more information to system operators on expected chum emergence, greater ability to protect chum redds, manage river flows
- ▶ Assumptions
 - Spatial pattern of bed temperatures relatively constant over time
 - Use of 932 ATU cutoff provides conservative protection for chum
- ▶ Pre-season estimate based on interpolation from 2006-2007 map of days to emergence
- ▶ Estimate will be updated in-season using temperature data from real-time system
 - Account for annual changes in river or bed temperatures
- ▶ Predictions could be tested by seining, redd-capping, or direct observation

2010-2011 Preliminary Chum Redd Analysis

Chris Murray, David Geist, Evan Arntzen, Yi-Ju Bott, Marc Nabelek, and Katherine Murray

Pre-Season Estimate for 2010-2011

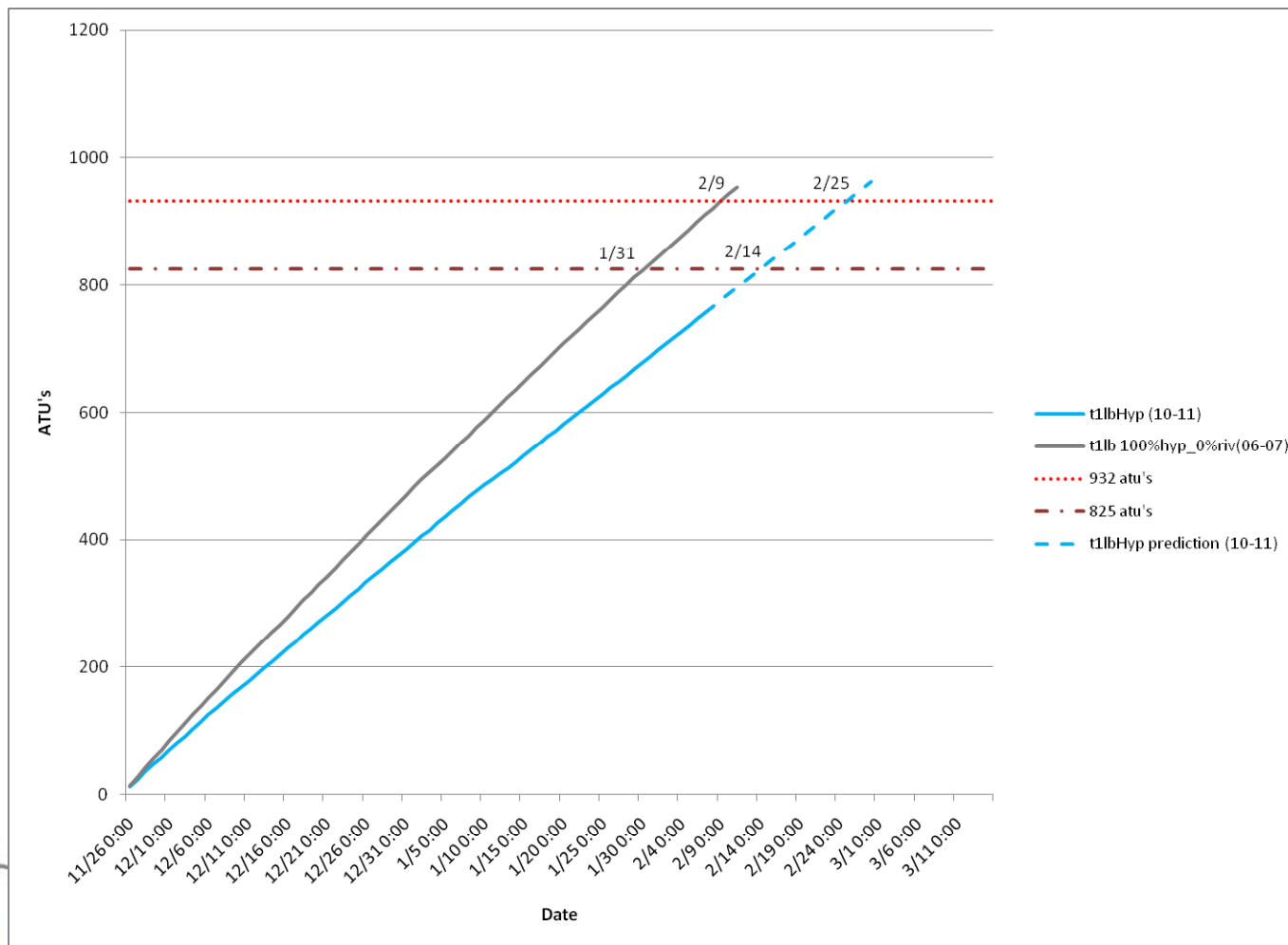
- ▶ Mapped location and recorded spawning dates for each chum redd at end of 2010 spawning period
- ▶ For each redd location, interpolated days to emergence from 2006-2007 map, added to spawning date



	Pre-season
Earliest	2/7/2011
10%	2/11/2011
50%	4/6/2011
90%	4/18/2011

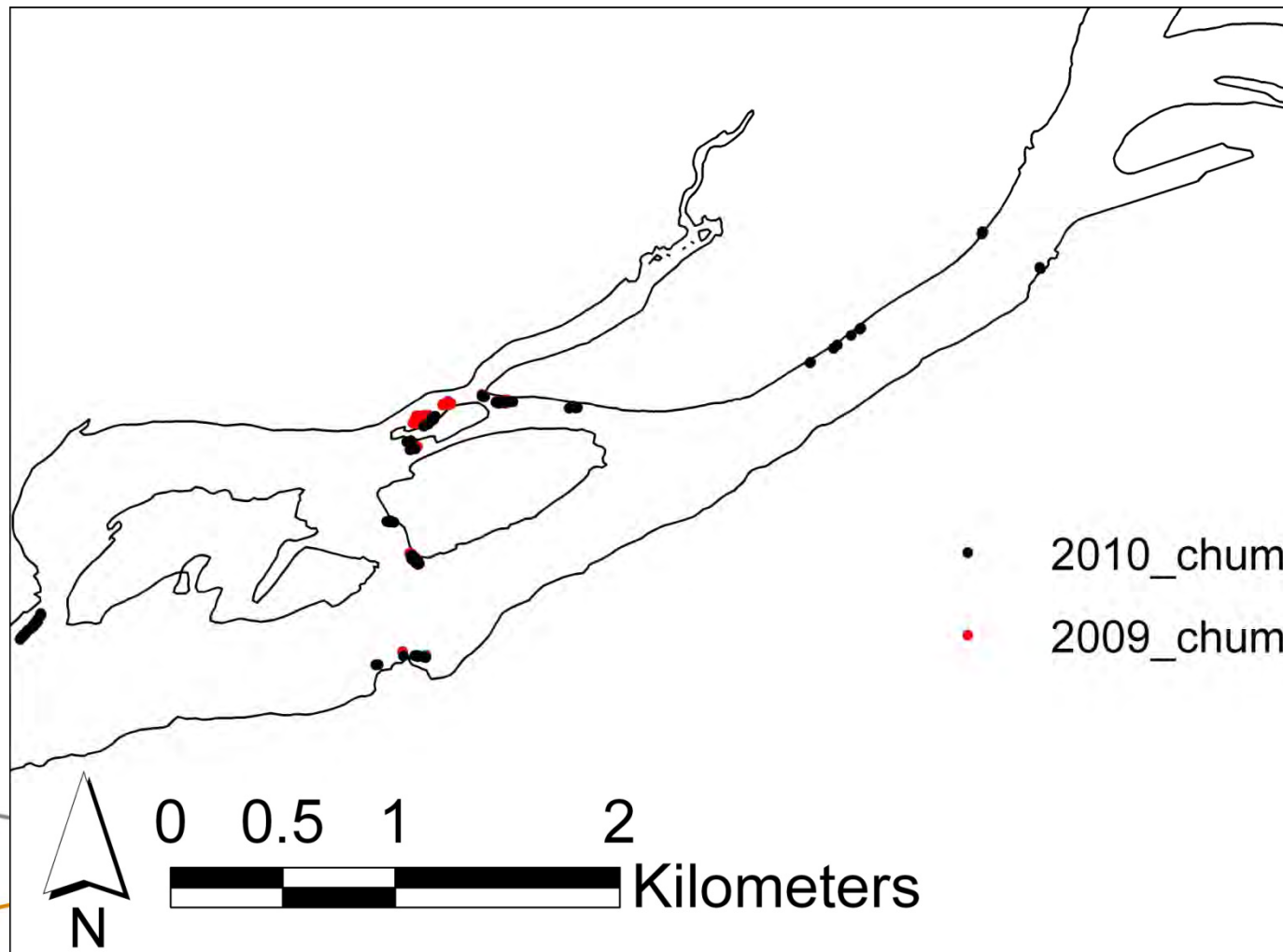
ATU Curves from Real-Time Logging System

- ▶ T1LB Hyporheic sensor is lagging 2006-2007 by about 2 weeks – cooler hyporheic temperatures suggest later start for emergence and later date for peak emergence



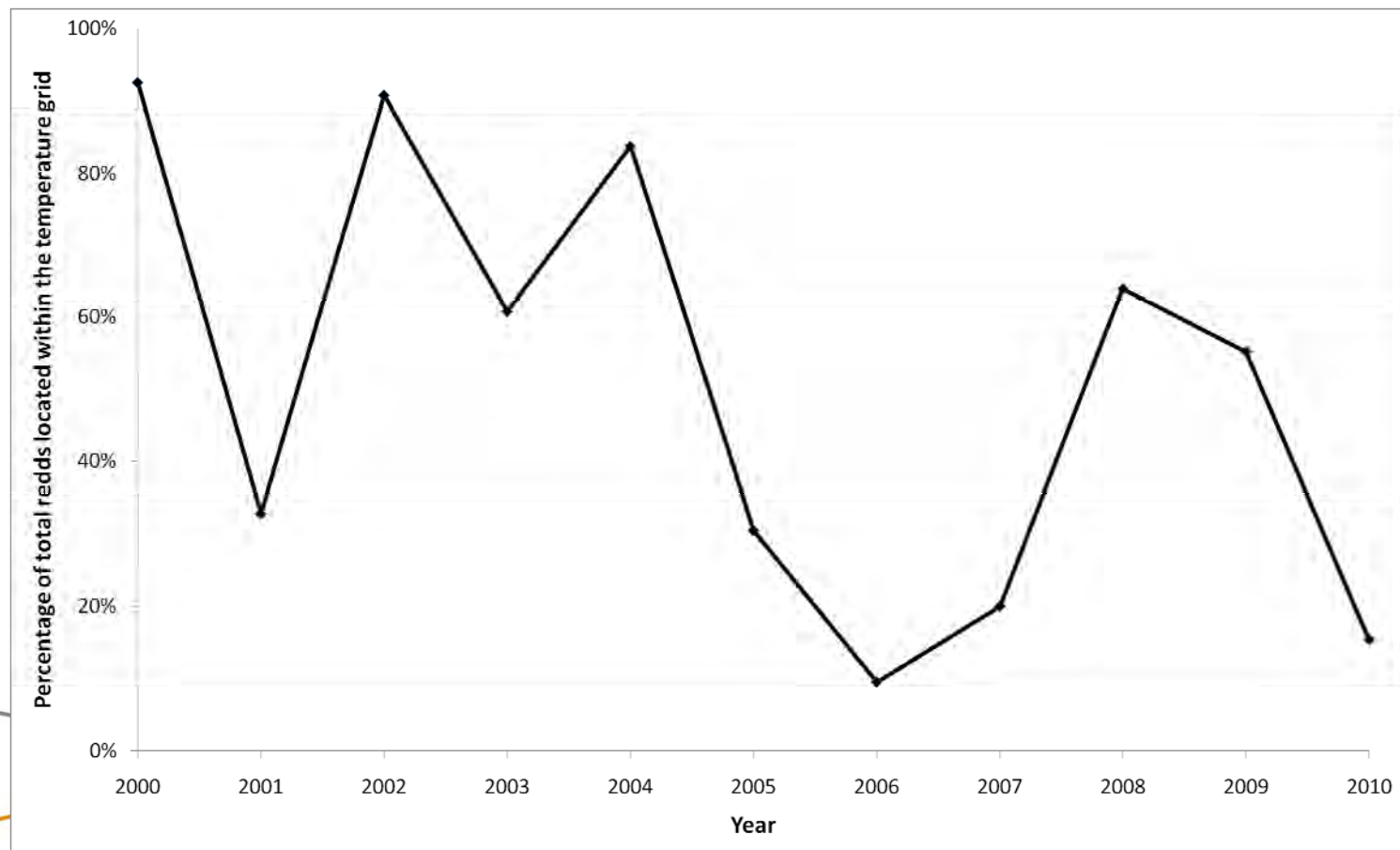
Distribution of Chum Redds in 2009 and 2010 Within Wider Ives Island Area

- ▶ 43 of 82 redds in days to emergence map in 2009, only 16 of 164 in 2010



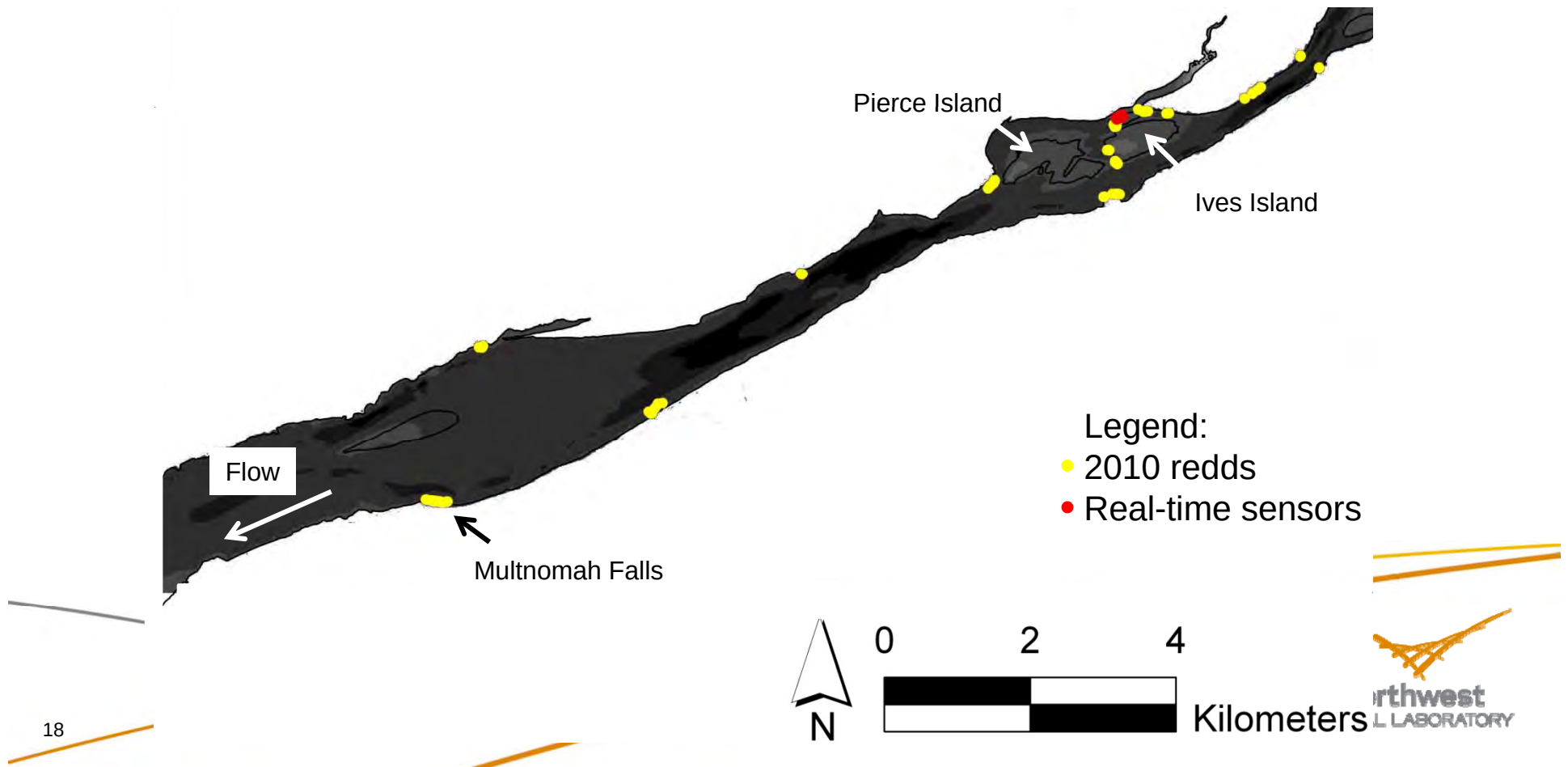
Percentage of Redds Within Map of Days to Emergence Varies from Year to Year

- ▶ Greater than ~ 50% in 6 of 11 years, but as low as 9%
- ▶ May want to place additional sensors in years when proportion in grid of days to emergence is low



2010 Redd and Tailwater Elevations

- ▶ 18 redds near real-time sensors
- ▶ Elevations of redds near real-time sensors ranged from 6.6 feet to 9.2 feet
- ▶ A tailwater elevation of 11.5 ft generally sufficient to protect the redds



Summary

- ▶ Pre-season estimate available for 2010-2011 redds
 - 50% emergence expected on 4/6/11
- ▶ Real time data indicates hyporheic temperature is lower than 2006-2007
 - Delay emergence by ~ 2 weeks
- ▶ Proportion of redds within study area grid variable
 - Very representative in some years, much less in others
 - May want to place additional sensors in years with fewer redds within grid area
- ▶ Most 2010 redds fall within DEM coverage
 - Elevations of redds near real time sensors estimated
 - 11.5 ft tailwater elevation should be sufficient to protect redds

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 9, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Review Meeting Minutes/Notes

TMT members reviewed the 2/23 Official Meeting Minutes and Facilitator's Notes. With no suggested changes, they were considered final.

Chum Emergence Model

Dennis Schwartz, COE, provided an overview and update on the development of a chum emergence model to support decision-making around chum operations in the spring and fall. He said he had shared the information at FPAC and that the model was being developed by SRWG and reviewed through the AFEP process. The following bullets reflect highlights of his presentation:

- The COE worked with PNNL on the predictive model.
- It focused on timing of emergence and the interface of emergence with spill at Bonneville.
- 2006-2007 data was used to develop the model and it has the capacity to be updated with real time data.
- 932 accumulated thermal units is the criterion for determining 50% emergence in the study area, the Ives Island channel. That number was determined based on lab emergence studies.
- Tests of the model so far have shown actuals to be within two weeks of the pre-season estimates for emergence.
- The COE is exploring the possibility of placing sensors in other spawning areas to capture a more complete spawning/emergence picture (as low as 9% of chum spawning occurred in the Ives Island mapped area).
- The COE also found that using an 11.5 feet tailwater elevation at Bonneville is sufficient to protect spawning chum this year – with 16 of 18 redds protected.
- Next steps with model development include an additional year of testing TDG levels in the lab to determine impacts of TDG exposure up to 130%. So far, tests have shown emerged chum to have considerable tolerance to elevated TDG levels.

Questions and comments:

- This tool will be most useful during low flow years.

- Is there an opportunity to tour the lab? Response: Dennis is willing to coordinate a field trip to the lab if there is interest. TMT members will discuss this off-line and work directly with Dennis on this.
- What is the applicability to other fish, in terms of the findings around tolerance to higher TDG levels? Response: These findings are specific to chum.
- Are you tracking temperatures during spill? Response: Yes, and, temperatures are not typically an issue of concern for the chum.

Water Supply Forecast

Steve Barton, COE, provided updated water supply forecast information, starting with RFC forecasts: Above Grand Coulee, the forecast showed 107% of normal for the water year; above Ice Harbor, 115% of normal; and above The Dalles, 107% of normal. All areas saw lower water supply for the first three weeks of February and a sharp increase later during the month.

The snow map showed increases in snow in Washington and Oregon in late February, bringing those areas of the basin back to near normal snow pack, along with the rest of the Columbia and Canadian basins.

Action: Steve said he would post the SNOTEL map on the TMT web page later today.

Steve went on to discuss the updated water supply forecasts – all showed normal to near normal precipitation with an assumed 110% of normal precipitation for the month of March.

Dworshak Operations

Steve Barton, Division COE and Steve Hall, Walla Walla District COE, shared an update on Dworshak operations. Based on the latest forecasts showing a water supply volume ranging between 2.7 and 3.3 MAF, the current flood control target for the end of March was currently 1445' (using the Principle Component forecast it is 3.3 MAF which is above the average of the various other forecasts). Walla Walla District submitted a deviation request to target 1479.9'. The deviation request and flood risk analysis were being discussed internally by the COE, and a March target elevation at the project would be determined soon. The COE planned to monitor and make decisions based on the forecasts, risk analysis, observed conditions and multiple needs of the system. Currently, the project was operating at 12.5 kcfs outflows which the COE said allows for flexibility to operate toward either flood control target elevation. And, Steve Barton acknowledged that a decision will need to be made soon.

Action/Next Steps: The COE will complete its risk analysis and internal discussions, and follow up with TMT via email as to the resulting decision about the target elevation and associated operation at Dworshak.

Question: Is the COE considering a flood control shift to Grand Coulee? Response: The risk analysis assumes no flood control shift in March. With the specific constraints on Grand Coulee due to drum gate maintenance, and given the above average water year, a

shift is not as desirable – though it is not necessarily off the table for later consideration once the risk analysis has been completed and a flood control target at Dworshak has been determined.

Fish Operations Plan

Dan Feil, COE, updated TMT that the draft Spring Fish Operations Plan (FOP) had received many comments since it had been posted for review, and that the COE was working to incorporate the comments. Given this, the final FOP would not be submitted to the court this Friday as had been previously thought; Dan suggested the final would be out and posted next week. Rick Kruger, Oregon, said they had submitted comments to the COE and requested that they be posted to the TMT page. He commented particularly that Oregon objected to the proposed spill plan at John Day.

Next Steps/Action: The final FOP will be posted to the TMT web page and included as Appendix E in the Fish Passage Plan. Comments from Oregon will be linked to today's agenda under the Fish Operations Plan agenda item. Oregon requested that the COE respond in writing directly to the comments rather than just via the final plan. Dan Feil acknowledged this request. TMT will revisit the final plan at their next meeting, scheduled for 3/23.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects: Grand Coulee was at elevation 1257.65' and drafting toward spring targets for flood control and drum gate maintenance. Hungry Horse was at elevation 3514.33', with 6.3 kcfs outflows. Steve Barton, COE, reported on projects: Libby was at elevation 2384.3', with 3 kcfs inflows and 16.3 kcfs outflows. Unit 5 is out due to a brake outage so the project is operating with 4 units and will continue as such over the next couple months. Given that, a mid-March flood control target deviation request has been submitted and the project will target instead an end of month elevation. It was noted that there is a disparity in the forecasts at Libby similar to what was seen at Dworshak and the COE was asked about their different approach for managing the disparity at this project. Steve Barton suggested that given the flexibility at this project, they were confident in the 2364' end of March target. Albeni Falls was operating at 24 kcfs inflows and 22.2 kcfs outflows, and was currently at elevation 2055.3'. Dworshak was at elevation 1492.8', with 3.8 kcfs inflows and 12.5 kcfs outflows. Lower Granite day average outflows were 50.9 kcfs/54.2 kcfs weekly average; Priest Rapids day average flows were 133.3 kcfs/142.5 kcfs week average; McNary day average outflows were 206.5 kcfs/209.9 kcfs week average; and Bonneville day average outflows were 216.2 kcfs/217.2 kcfs week average.

Fish – Paul Wagner, NOAA, reported that juvenile sampling had begun for the season at Bonneville and at the traps in Snake River tributaries. So far, a few yearling chinook and about 200 subyearling/day were being observed at Bonneville. Lamprey counts were being conducted for the first time at Bonneville and about 200/day were being observed at the project. Lamprey will be counted at other projects also. A question was asked about kelt, and Dennis Schwartz, COE, reported that one had been observed at Bonneville so

far. FPOM would be discussing the kelt study tomorrow (3/10) and would have a summary. Kelt operations will be captured in an appendix to the Fish Passage Plan.

Power system – Nothing to report at this time.

Water quality – Laura Hamilton, COE, reported that the fixed monitoring stations were coming on line at the Lower Granite forebay and at Camas/Washougal.

Next Meeting, March 23, 9:00 am

Agenda items include:

- Hanford Reach Update
- Water Supply Forecasts – Mid month updates
- Dworshak Operations
- Final Fish Operations Plan
- Spill Priority List
- BPA Emergency Action Plan List
- MOP Operations/Navigation Plan
- Maintenance Updates
- Operations Review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

March 9, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of USFWS, Washington, Oregon, Idaho, COE, NOAA, BPA, BOR, CRITFC, Umatilla Tribe, USFWS and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Review Meeting Minutes for February 23, 2011

There were no comments today on either the facilitator's notes or the official minutes for February 23. The official minutes were posted yesterday; any comments should be presented at the next TMT meeting.

3. Chum Emergence Model

Dennis Schwartz, COE Portland fish passage team, gave a presentation on COE and SRWG joint development of a model for predicting chum emergence at Ives Island below Bonneville. Schwartz had previously given the presentation to FPAC on this new tool for making chum-related decisions.

The model uses a spatial pattern of riverbed temperatures over time to predict 10%, 50% and 90% emergence dates for when redds reach 932 temperature units, the point at which fry were assumed to emerge. The model is being tested by comparing the preseason estimates to actual emergence dates. In 2010, emergence happened about 2 weeks earlier than predicted, and it looks like the same phenomenon will recur this year. The study has found that cumulative ATU exposure is a consistently reliable predictor of emergence.

Another finding is that chum vary their spawning locations widely each year, meaning the model doesn't have data to predict emergence at some redd locations. Many of the GPS-mapped redds are in the hyporheic zone, where cooler river flows mix with warmer water upwelling in the riverbed. Chum are apparently good at finding such spring-fed locations to spawn. However in 2009 only about 50% of redds were laid down in the mapped study area, and in 2010 the rate was down to 16%. The study team might need to consider moving some of the sensors to new spawning grounds.

The chum spawning model can provide information to decision makers each year on the elevation at which river flows should be maintained to protect

chum redds until emergence, as well as the dates on which 10%, 50% and 90% emergence can be expected. This year, the predicted 50% emergence date was April 6. The actual date is expected to be about 2 weeks earlier due to cooler temperatures in the hyporheic zone. A tailwater elevation of 11.5 feet below Bonneville is estimated as sufficient for redd protection this fall. Schwartz showed TMT a graph of pre-season chum spawning estimates for 2010-11, attached to this item on today's agenda.

Questions and discussion: Rick Kruger, Oregon, asked what the temperature differential is across the Ives Island south channel. About 3-4 degrees C, Schwartz said.

Paul Wagner, NOAA, said the model will be an extremely useful tool in low-water years. This year it probably won't be needed because plenty of water is expected above elevation 11.5 feet, and depth compensation in April will likely protect fish from the TDG effects of spill. Schwartz said the final research for the chum emergence model is laboratory exposure to TDG levels up to 130% at various life stages. The first year of the study found chum are tolerant of TDG levels up to 125% on emergence. This year's experiment will study even higher levels such as 130%. There are clearly no problems for chum at 120% TDG, so there should be no problem with exceeding 105% in the Bonneville tailwater when the state water quality waivers take effect for spill season.

Charles Morrill, Washington, asked how deep the egg pockets are in laboratory exposures. Researchers have the ability to vary the pocket depth, Schwartz replied. For this study, fry are exposed to the average egg pocket depth found in the river. Ruth Burris, PGE, asked whether 120% TDG tolerance is limited to chum. It's very species-specific to chum at the sac fry emergence stage. Chinook and other species are not as tolerant of high gas levels.

Scott English, COE, asked whether researchers continue collecting temperatures after spill starts April 10. Yes, real-time sensors in the riverbed collect real-time data on gas and temperature exposures, Schwartz said. Once spill starts, river flows increase which also increases mixing in the hyporheic zone, where water gets forced into the gravel. At that point there could be an issue with gas levels, but temperature won't be a problem.

Wagner noted that adding depth to the river tends to extend incubation time. During spill there's typically enough depth compensation that TDG isn't a problem except in low flow years. There can be problems in low flow years with releases for the Spring Creek Hatchery and the Bonneville corner collector operation for kelts.

Schwartz offered to set up a tour of the chum laboratory in Richland if TMT members are interested. The COE will continue to input data into the chum

spawning model every year, and TMT will follow development of the model as it goes through SRWG and AFEP review.

4. Water Supply Forecast

Steve Barton, COE, gave an update on the latest water supply forecasts.

RFC forecasts: From the main TMT website, Barton went to the RFC site's water supply forecast page and clicked on "precipitation summary" to show TMT the weekly divisional precipitation summary for water year 2011 (last updated 2/22/11). Based on those data, precipitation forecasts for the water year are:

- Columbia basin – 107% of normal.
- Snake above Ice Harbor – 115% of normal
- Northern Idaho – 97-107% of normal
- Western Montana – 114-128% of normal, has good snowpack

COE forecasts: Barton gave TMT snowpack information from the latest SNOTEL map which will be posted to the TMT site after today's meeting. Snow in the Oregon and Washington Cascades was below normal in January but is back to normal now, with the exception of the central Washington Cascades at 70-80% of normal. British Columbia snowpack is near normal with the exception of the far north of the basin near Mica Dam, which has 85% of normal.

Barton and John Roache, BOR, gave the latest water supply forecasts for individual projects. The general theme is normal to slightly above normal conditions throughout the basin:

- Libby – 7.1 maf, April-August, 121% of normal
- Libby (RFC) – 25 maf, April-August, 105% of normal
- Dworshak – 3.3 maf (see next agenda item for further discussion)
- Lower Granite – 21.6 maf, April-July, 100% of normal
- Grand Coulee – 66.1 maf, April-September, 103% of normal
- The Dalles – 92.3 maf, April-August, 99% of normal
- Hungry Horse (BOR) – 2,534 kaf, March-July, 121% of normal

5. Dworshak Operations

Barton gave TMT an update. Dworshak is discharging 12.5 kcfs or full powerhouse flows. The strategy behind 12.5 kcfs releases is to provide flexibility in either direction without risking discharges in excess of 110% TDG. The COE uses the principal components forecast (i.e. the average of all water supply forecasts) for its flood control guidance. The principal components forecast for Dworshak is 124% of normal, Steve Hall, COE Walla Walla, reported – 3.3 maf (3,329 kaf). Other Dworshak forecasts are:

- ESP – 3,077 kaf.
- Walla Walla (regression) – 2,849 kaf
- NRCS – 2,719 kaf
- RFC – 2,900 kaf

Barton said the updated Dworshak principal components forecast will be posted to the TMT website tomorrow along with updated flood control guidance going forward. The current guidance for Dworshak is elevation 1,445 feet by end March. The COE is working with the Walla Walla district to flesh out its deviation request for a 1,479.9-foot elevation, or 39 feet above the end of March flood control. The deviation request is consistent with a water supply forecast of 2,970 kaf, Hall noted. The COE will monitor the water supply at Dworshak closely.

Tom Lorz, CRITFC, asked whether the COE is considering a flood control shift to Dworshak from Grand Coulee this year. No, Barton said, because the water must be returned per the rules of flood control shifting, and Coulee can't accept a return due to ongoing drum gate maintenance. The COE will investigate the potential for a shift on the basis of flexibility around its flood control risk analysis for Dworshak. By the end of this week or early next week, the COE will summarize the latest flood control information in an email to TMT members. TMT will revisit Dworshak operations at its next meeting March 23.

6. 2011 Fish Operations Plan

Dan Feil, COE, led a discussion. The COE received a number of comments on the draft FOP recently released. The number of comments means the COE won't be finished incorporating them into the FOP by March 11 as planned. The COE expects to release a revised draft next week. It will probably be a final version due to time constraints, and it will be posted to the TMT page as usual. The final FOP will also be posted to the Fish Passage Plan page as appendix E.

Rick Kruger, Oregon, stated that Oregon objected to the proposed 30% spill operation at John Day via RIOG. Oregon has submitted comments on the FOP and wants a response to the comments in writing. The comments cover a range of topics but the primary concern is John Day spill. Kruger requested that Oregon's comments be posted to the TMT web page as attachment A to this agenda item; Barton said he will post them as requested. TMT will revisit the FOP at its next meeting March 23.

7. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,257.65 feet. Wagner asked whether the COE has considered a Dworshak-Grand Coulee shift and Barton replied that it's not off the table. The COE is examining the effect drum gate maintenance will have on Grand Coulee's ability to accept a shift. Hall added that

a shift is generally not advisable in water years of 3 maf or greater such as this year. In high flow years, inflows are likely to exceed powerhouse capacity, making it difficult to draft the water back out according to the rules of the shift.

Libby is at elevation 2,384.3 feet, with 3.0 kcfs inflows and 16.3 kcfs discharges. The project is running on 4 units because unit 5 is out of service until the end of May due to brake failure. There is a deviation request for a flood control elevation of 2,364.3 feet by mid March. Instead, the COE will float the target for the end of March flood control elevation with the 4 units available. Wagner noted the COE forecasts for both Libby and Dworshak differ from other forecasts, and a deviation request is being made at Dworshak. Does that mean the COE is confident of its Libby forecast? Barton said yes, the only deviation now is the mid March flood control elevation, which is unreachable without full powerhouse capacity. In light of the situation, the COE has the flexibility to float over the mid-month target this year and aim for the end of March target of 2,364.3 feet, same as the mid-month target. The COE will continue to track all Libby forecasts closely, including the early bird and mid-month.

Hungry Horse is at elevation 3,414.33 feet. Albeni Falls is at elevation 2,055.3 feet with inflows of 24 kcfs and discharges of 22.2 kcfs. Dworshak is at elevation 1,492.8 feet with inflows of 3.8 kcfs and releases of 12.5 kcfs. Barton reminded TMT the Dworshak flood control curves are not up to date.

Lower Granite is releasing 50.9 kcfs; last week's average was 43.2 kcfs. Priest Rapids is releasing 133.3 kcfs; last week's average was 145.4 kcfs. McNary is releasing 206.5 kcfs; last week's average was 209.9 kcfs. Bonneville is releasing 216.2 kcfs; last week's average is 217.2 kcfs.

b. Fish. Bonneville is the only project sampling for fish at present, Wagner reported. Sampling began March 2 and a few yearling Chinook have been seen. Russ Kiefer added that Idaho is starting to put smolt monitoring traps in Snake River tributaries. Passage is minimal at this point except for subyearlings, which are passing Bonneville at a rate of a few hundred fish per day. This is the first year lamprey passage is being tracked. Lamprey juveniles are being observed at Bonneville at the rate of about 100 per day. As of March 4, one kelt had been observed. Charles Morrill, Washington, asked whether a written summary of kelt activity at Bonneville is available. Yes, in the decision matrix of appendix A to the FPP, Schwartz replied.

c. Power System. There was nothing to report today.

d. Water Quality. Fixed monitoring stations are beginning to come on line in preparation for spill season, beginning with Little Goose forebay and the Camas-Washougal gage, Laura Hamilton, COE, reported.

3. Next Meetings

The next TMT meeting will be on March 23. The agenda will cover Dworshak operations, the spill priority list, a Hanford update, the BPA emergency action plan, mid-month water supply forecasts, the final FOP, and a report on reopening the river for navigation. The following TMT meeting will delve into the specifics of MOP operations.

Subsequent TMT meetings were scheduled for alternate weeks with additional meetings or conference calls as needed. Regular meeting dates are April 6 and 20; May 4 and 18; and June 1, 15 and 29.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
David Wills	USFWS
Charles Morrill	Washington
Doug Baus	COE
Paul Wagner	NOAA
Rick Kruger	Oregon
Paul Koski	BPA
Dan Feil	COE
Tim Heizenrader	Centaurus
Scott English	COE
Dennis Schwartz	COE
Laura Hamilton	COE

<i><u>Phone:</u></i>	
Russ Kiefer	Idaho
Tom Lorz	CRITFC/Umatilla
John Roache	BOR
Joel Fenolio	COE
Steve Hall	COE Walla Walla
Rob Allerman	Deutsch Bank
Richelle Beck	DRA
Shane Scott	PPC
Russ George	WMC
Dave Benner	FPC
Doug Vine	Thompson Reuters
Tom Le	Puget Sound Energy
Barry Espenson	CBB
Mike Shapley	Snohomish PUD
XX	Iberdrola Renewables
Nick Lane	BPA
Ruth Burris	PGE
Harry Burge	USFWS
Bruce McKay	Consultant

From: Dukes, Joan [mailto:JDukes@NWCouncil.org]
Sent: Wednesday, March 02, 2011 2:32 PM
To: Katherine Cheney [Katherine.Cheney@noaa.gov]
Cc: Ed Bowles; Ron Boyce; Anthony Nigro; rick.kruger@state.or.us; DEHOOG Roger J
Subject: State of Oregon's comments on the U.S. Army Corps of Engineers (Corps) draft of the 2011 Spring Fish Operations Plan (FOP)

Katherine,

Please forward this email to the distribution list for the Regional Implementation Oversight Group (RIOG). What follows are the State of Oregon's comments on the U.S. Army Corps of Engineers (Corps) draft of the 2011 Spring Fish Operations Plan (FOP) describing planned operations for fish passage at the Federal Columbia River Power System dams during spring fish migration season. The Corps released the FOP on February 23, 2011 and requested that comments on it be submitted by the close of business March 2, 2011.

- The FOP should clarify the Corps intent relative to continuing recent court-ordered operations. Although the Corps considers operations in the FOP to be consistent with the 2010 Supplemental Biological Opinion, the operations do not appear to be consistent with recent court-ordered operations, even though the litigation under which the court has ordered specific operations has not been settled.
- If the Corps' intent in the FOP is not to continue court-ordered operations, then the Corps should discontinue managing spill at Bonneville Dam based on Total Dissolved Gas (TDG) data from the Camas Washougal (CW) gauge. In previous FOPs, the Corps maintained the use of the CW gauge on the grounds that it was required by the Oregon TDG waiver to continue court-ordered operations. The Corps states in the FOP that the CW gauge will now be used to manage TDG at Bonneville Dam under the Washington TDG limits, even though the gauge is not required under either the Washington regulations or the Oregon TDG waiver.
- The FOP should not include passage by the dams of non-commercial vessels as a basis for reducing spill discharge rates or for short-term spill stoppages. In previous FOPs, these outages were largely limited to fish transportation barges and for commercial barges. The FOP extends these adjustments to non-commercial vessels. The number and extent of these outages for non-commercial vessels could result in substantial reduction in spill. The potential impact of extending these adjustments to non-commercial vessels on migrating salmonids should be vetted through the Technical Management Team or other Regional technical forums.
- At Lower Monumental Dam, the Corps should implement a uniform spill pattern rather than a bulk pattern in 2011. The FOP justifies implementation of the bulk pattern based on past studies. The 2009 studies showed no significant survival differences but did show improvements in passage conditions under uniform spill (e.g., increased SPE, decreased delay, etc.).

- The FOP should not include performance standards testing at 30% spill at John Day Dam in 2011. As Oregon pointed out at the Regional Implementation Oversight Group (RIOG) conference call on February 28, 2011 and in an earlier email from me to the RIOG (attached), the technical basis for the proposed testing is flawed and at least one more year of additional studies of 40% spill vs. 30% spill is warranted.

Although Oregon appreciates the opportunity to provide comments on the FOP, the Corps should allow more time for its review. The FOP has a large amount of detailed information, including substantial changes in project operations. Because of this, the five day review time allotted for this draft was insufficient for a thorough review of the document and raises substantial questions about the Corps' interest in substantive input from other parties.

Thank you, Katherine, for your help.

Sincerely,

Joan Dukes

From: Dukes, Joan [mailto:JDukes@NWCouncil.org]
Sent: Wednesday, March 02, 2011 2:28 PM
To: Katherine Cheney [Katherine.Cheney@noaa.gov]
Cc: Ed Bowles; Ron Boyce; Anthony Nigro; Rick Kruger; DEHOOG Roger J
Subject: State of Oregon Comments on the USACE's draft 2011 Spring Fish Operation Plan and Proposed John Day Spill Test

Katherine,

Please forward this email to the distribution list for the Regional Implementation Oversight Group (RIOG). What follows is the State of Oregon's formal position regarding the U.S. Army Corps of Engineers (Corps) proposal to test 30% spill at the John Day Dam in 2011 to determine if it meets the dam survival performance standard established in the 2008 Federal Columbia River Power System Biological Opinion (BiOp). The Corps bases its proposal on survival and passage studies conducted at John Day Dam in 2008, 2009 and 2010.

Oregon objects to a reduction of spill at John Day Dam to only the 30% level in 2011 for the following reasons:

1. Consistent with requirements for adaptive management in the BiOp, and based on recent information on passage and survival through the Federal Columbia River Power System (FCRPS), NOAA Fisheries, in collaboration with the States and Tribes, should reexamine the Biological Opinion performance standards. Oregon has consistently maintained that performance standards should not only include passage "at the concrete", but also measures of delayed mortality effects. Specifically, the performance standards in the BiOp should be expanded to include forebay and tailrace residence time, reach survival, bypass effects and Smolt-to-Adult Return (SAR).
2. Any proposal to evaluate whether performance standards are being met at FCRPS dams should include a decision analysis framework and an assessment of risk as part of its sensitivity analyses. There is no decision analysis framework presented in the proposal for John Day Dam, nor does the sensitivity analysis assess risk. A decision framework would incorporate other data and additional passage metrics. Important factors that should be incorporated into sensitivity analyses include differences in behavior and survival of acoustic-tagged fish compared to the run-at-large. The sensitivity analyses presented by the Corps shows that the calculated project survival is completely dependent on the survival of the reference groups, indicating that the calculated performance standard survival is extremely sensitive to handling, tagging, and transportation effects on the reference group.
3. The process of designing tests and reviewing test results should include full and transparent collaboration with the States and Tribes. Neither the report on the 2010 studies of survival and passage at John Day Dam, nor the full set of base data on which independent analyses could be made, has been released by the Corps for review and evaluation. Data from this study are being used to design the test the Corps has proposed to be conducted in 2011. Once the reports and data from 2010 (and 2011 and beyond- see bullet #4) are available, a collaborative technical team that includes the States and Tribes should be tasked with developing a suite of performance standards for testing spill levels

at John Day Dam and with developing a statistically robust study to evaluate whether the standards are being met at the Biological Opinion spill levels (30% vs. 40%).

4. At least one additional year of testing at 30% vs. 40% spill should be completed and the data be made available to the States and Tribes in a timely manner prior to formulating future testing to performance standards. It has been standard practice through the Corps' AFEP process to conduct two or more years of studies to adequately evaluate new configurations and operations when major changes are made at FCRPS dams. Because of major changes at John Day Dam in 2010, only the results of the 2010 study should be used for designing and evaluating spill levels and operations at John Day. These changes include the relocation of two Temporary Spillway Weirs to spill bays 18 and 19, installation of an extended deflector in spill bay 20 and installation of an improved avian deterrent wire array over the spillway stilling/tailrace. These changes in 2010 are not reflected in the studies conducted in 2008 and 2009.
5. Future tests of 30% vs. 40% spill should increase sample sizes to allow detection of statistical differences or tests should be conducted at higher spill levels, such as 30% vs. 50%. Oregon has consistently stated that the spill treatments of 30% vs. 40% lacks sufficient separation in physical and hydraulic conditions to produce detectable differences in passage metrics, at least at the current level of statistical rigor.
6. The proposal to test John Day Dam for performance standard compliance at 30% spill is not supported by the relevant available data. Evidence supporting the need for additional years of testing include:
 - a. The 2008 Biological Opinion performance standards have not yet been met for yearling Chinook at either 30% or 40% spill. Although yearling Chinook survival was slightly higher at 40% spill (95.0%) vs. 30% spill (94.4%), the statistical test lacks the power to differentiate between the estimates because of inadequate sample size.
 - b. Steelhead survival was significantly higher at 40% than 30% spill and met the performance standard for dam survival in 2010.
 - c. Forebay residence time, a metric important for evaluating fish passage, has been consistently shorter at 40% spill than at 30%, although not statistically different.
 - d. At the 30% spill level, more fish pass through the powerhouse and through the juvenile bypass. Recent information indicates that fish bypassed at FCRPS dams return at lower rates than non-bypassed fish (CSS Annual Report 2010). Yearling Chinook bypassed at John Day Dam returned at 11% lower rate than non-bypassed fish. Steelhead bypassed at John Day Dam returned at 8% lower rate.

All of the afore mentioned data and analyses indicates that juvenile in-river migrants perform better at 40% spill than 30% spill, and thus warrant more robust testing to clarify the results. None of the available data for the current dam configuration support a reduction of spill to 30% in 2011. If a single treatment test is done in 2011, it should be done at the 40% spill level.

Thank you, Katherine, for your help.

Sincerely,
Joan Dukes

Katherine,

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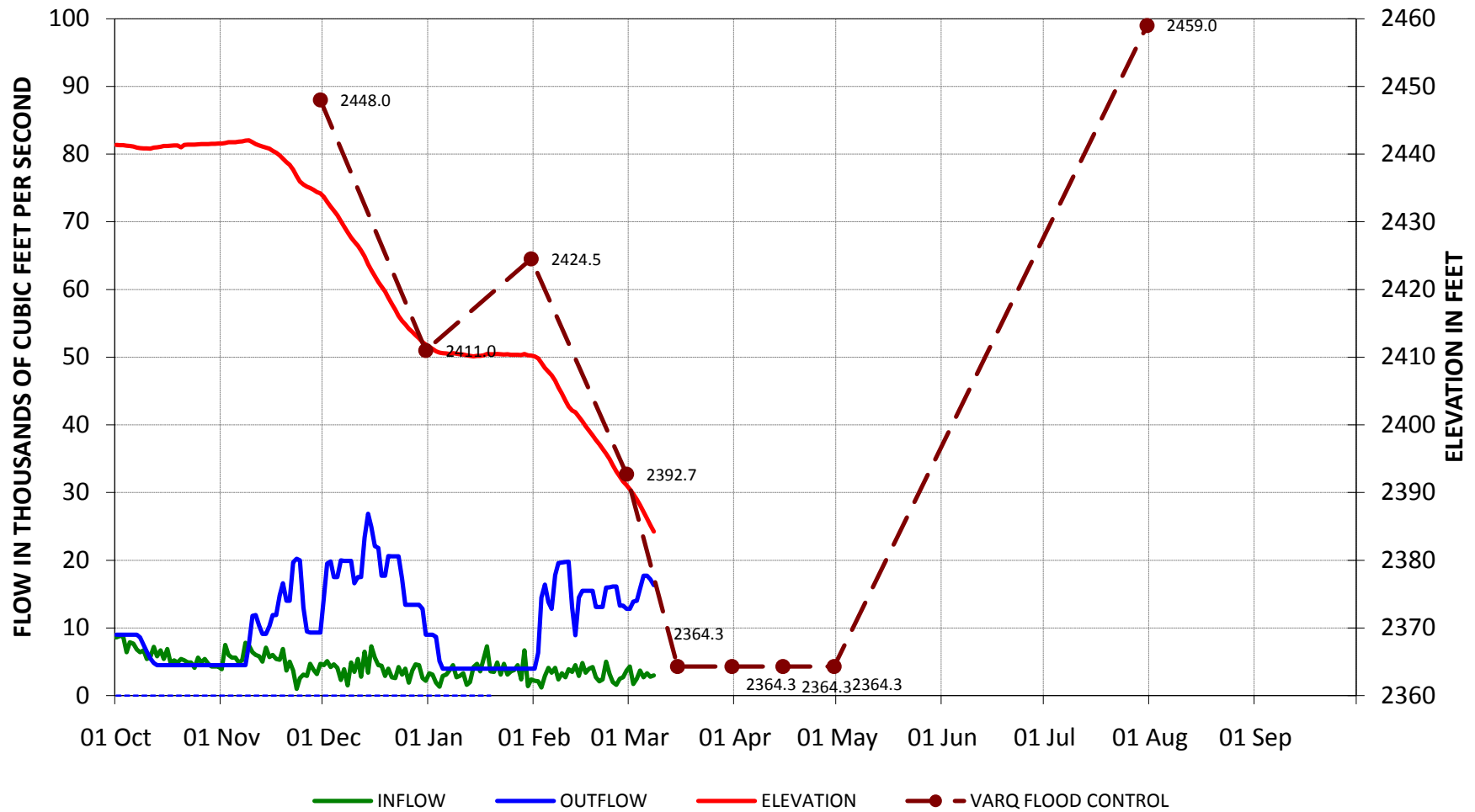
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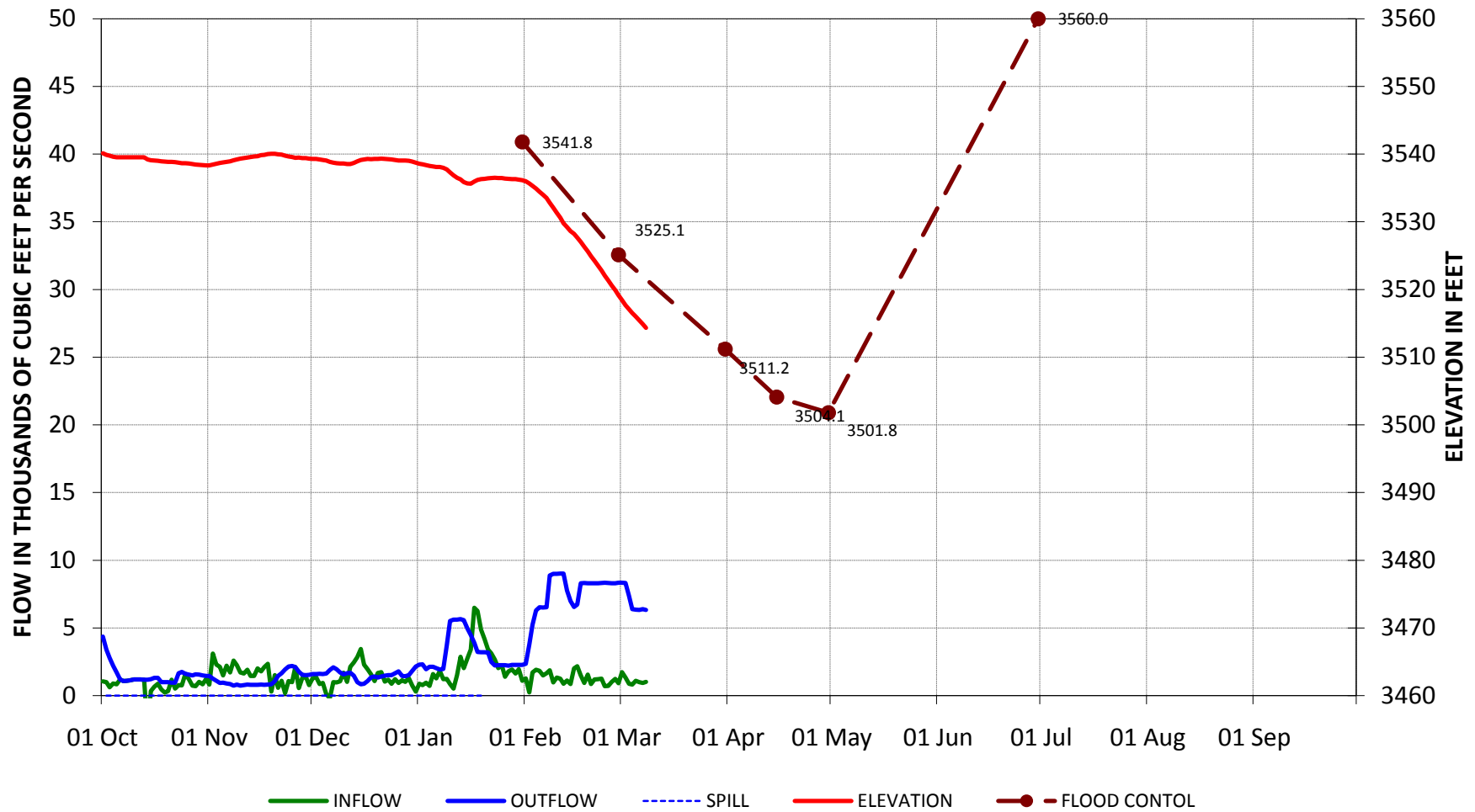
LIBBY DAM AND RESERVOIR

Water Year 2011



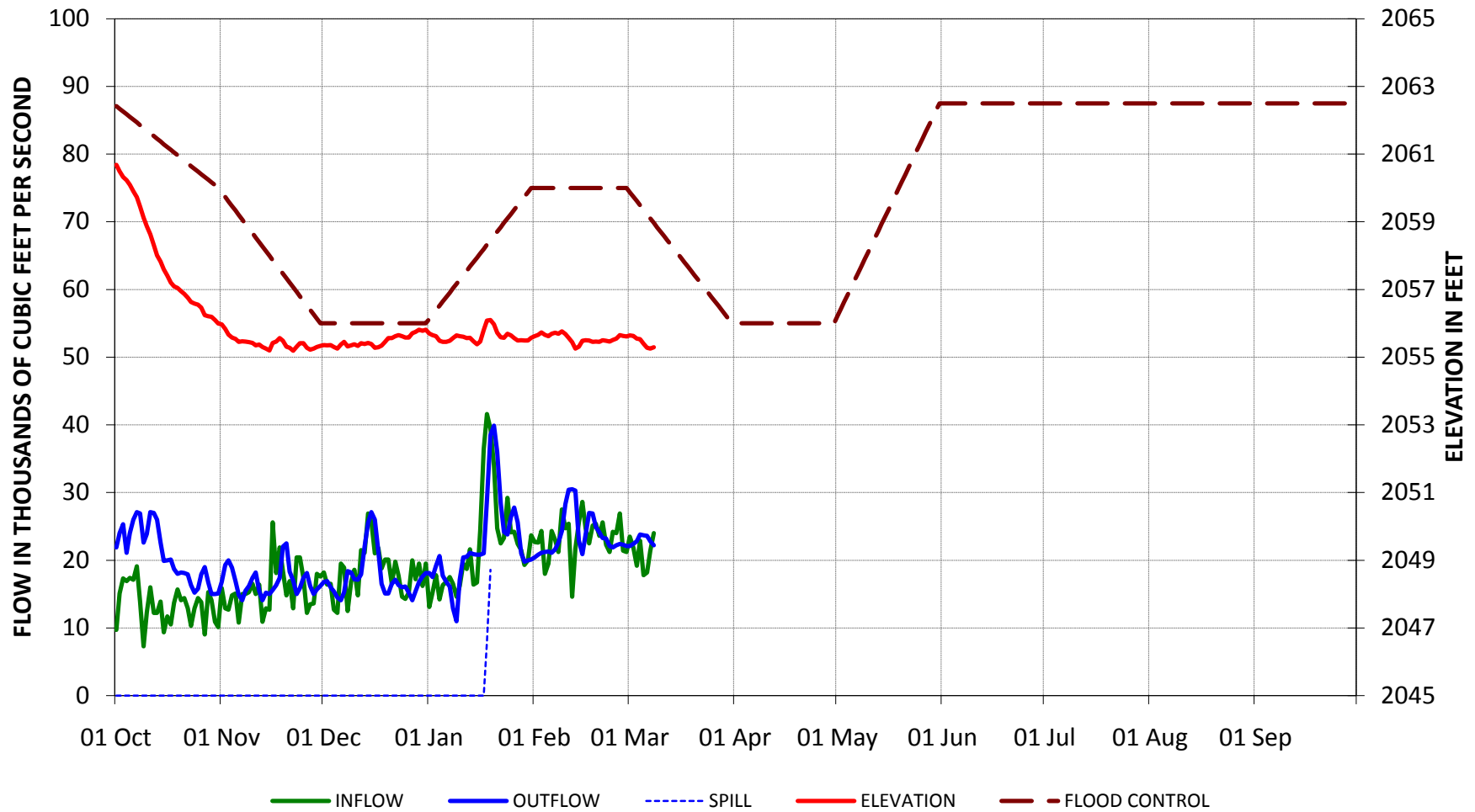
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



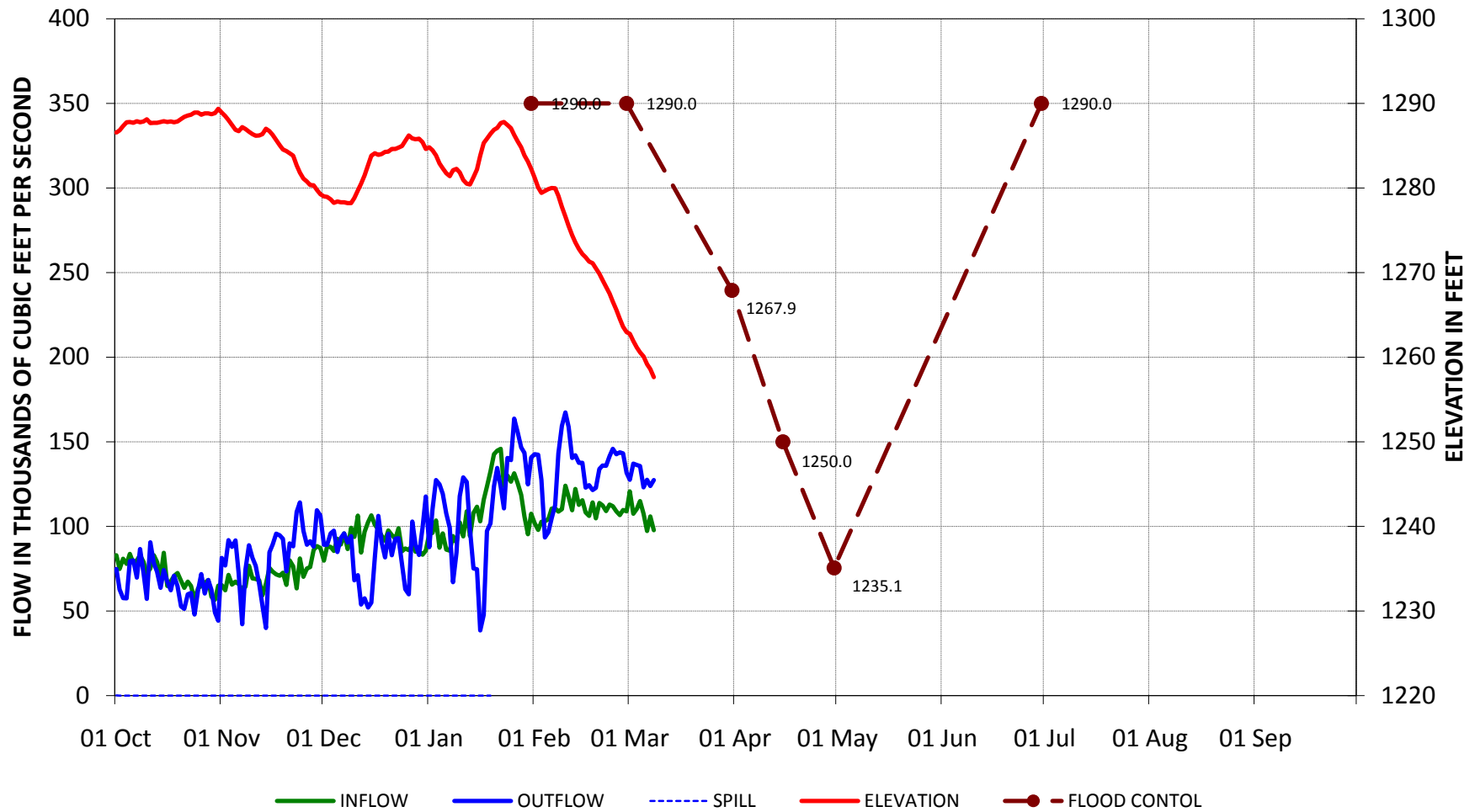
ALBENI FALLS DAM AND RESERVOIR

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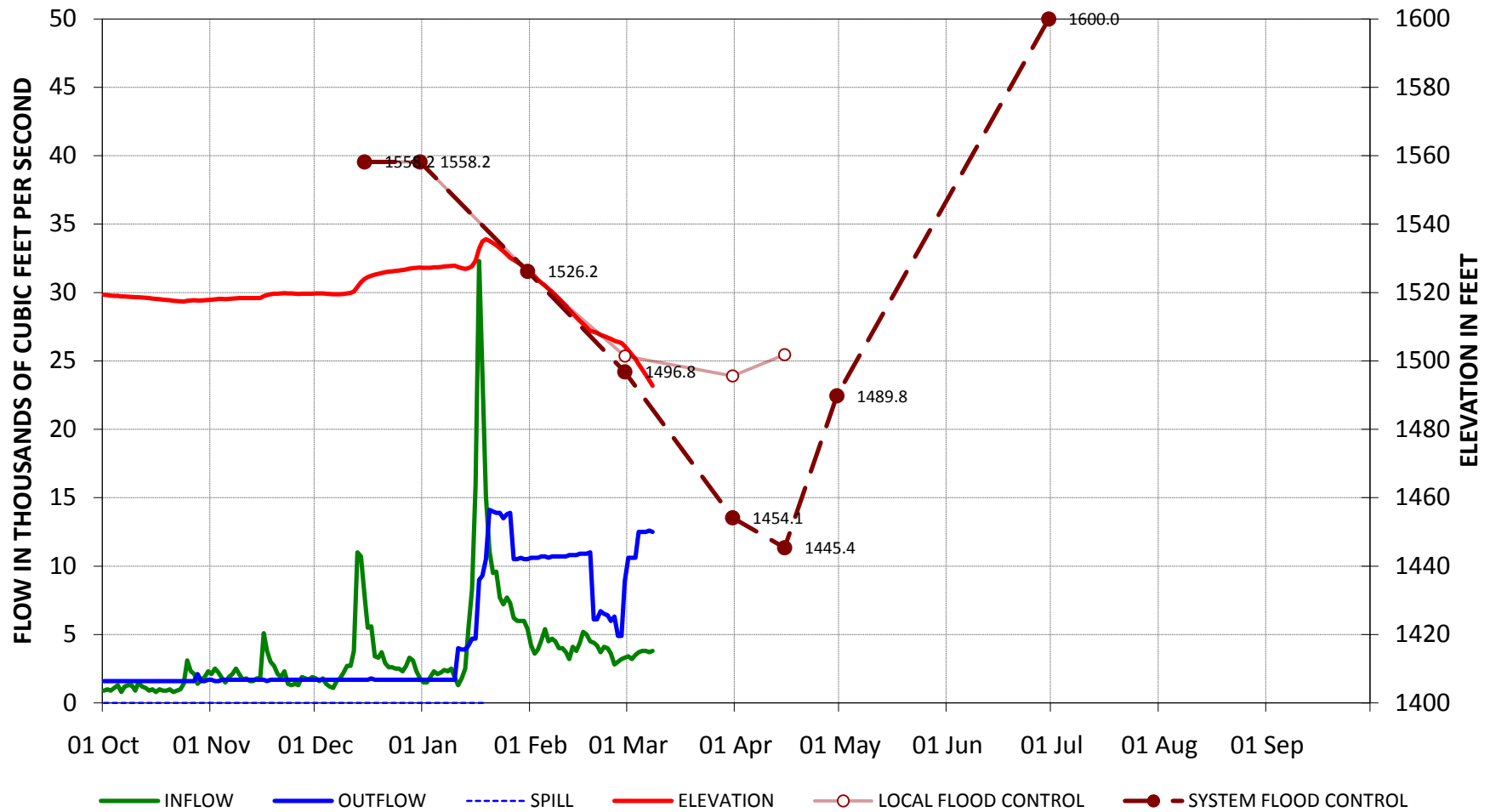
GRAND COULEE DAM AND RESERVOIR

Water Year 2011



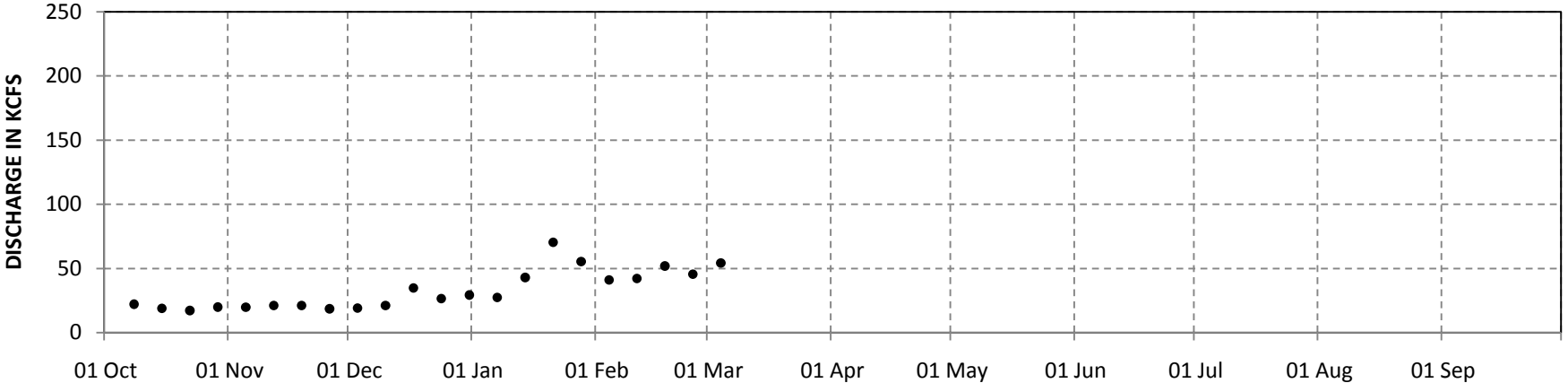
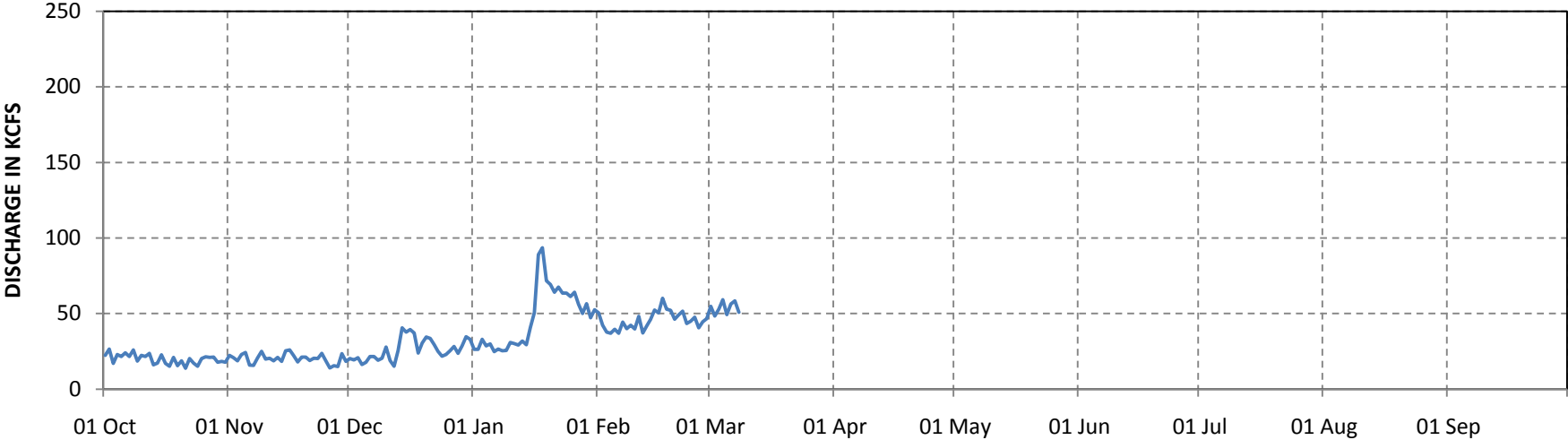
DWORSHAK DAM AND RESERVOIR

Water Year 2011



PROJECT DISCHARGE SUMMARY

SNAKE RIVER AT LOWER GRANITE DAM

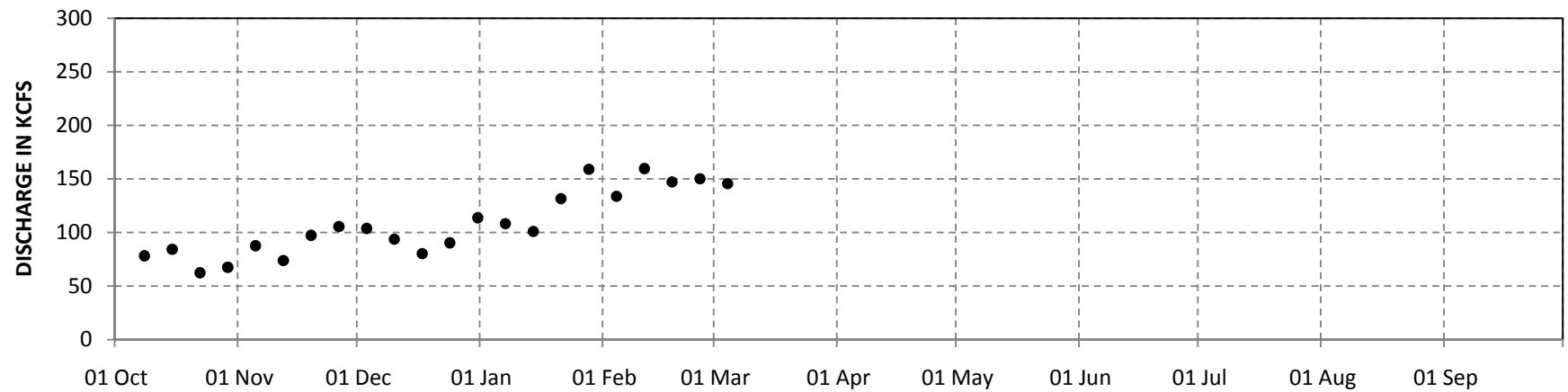


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



— OUTFLOW

— SEASONAL OBJECTIVE



— WEEKLY OBJECTIVE

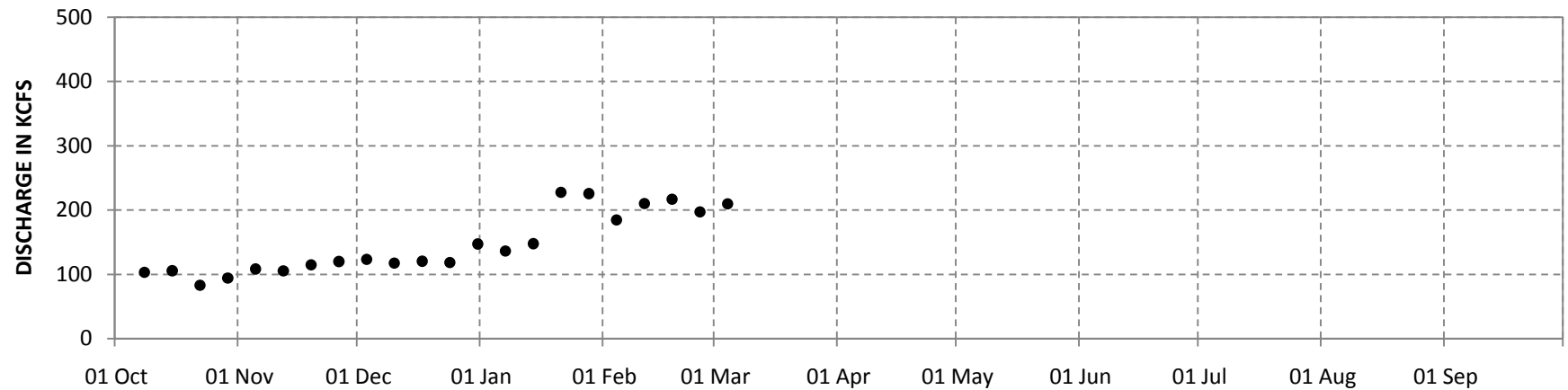
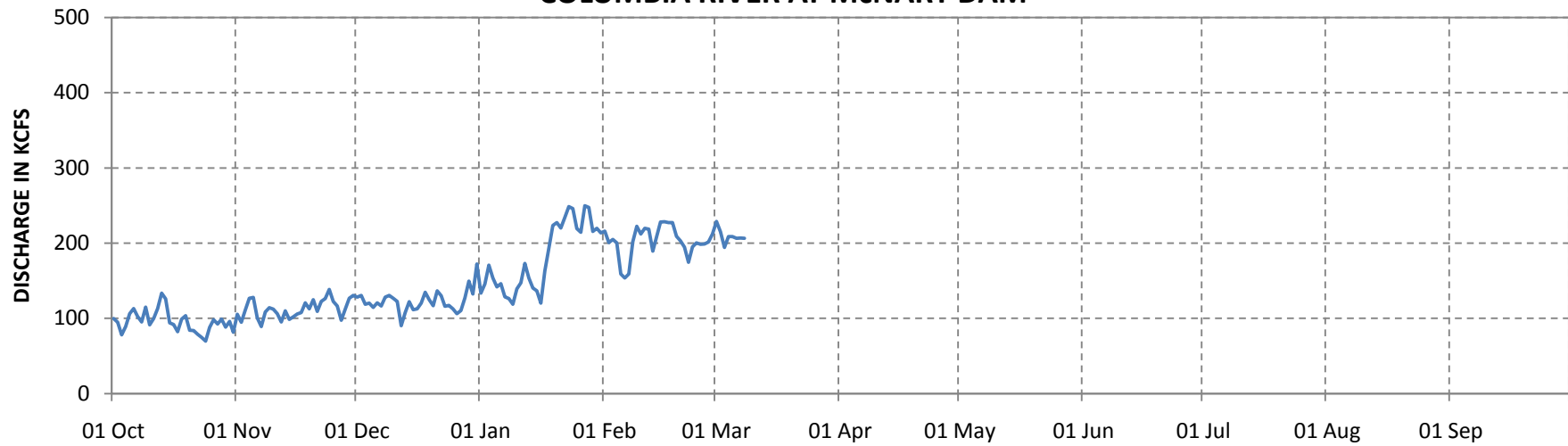
— SEASONAL OBJECTIVE

● WEEKLY OBSERVED

— SEASONAL TO-DATE

PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM

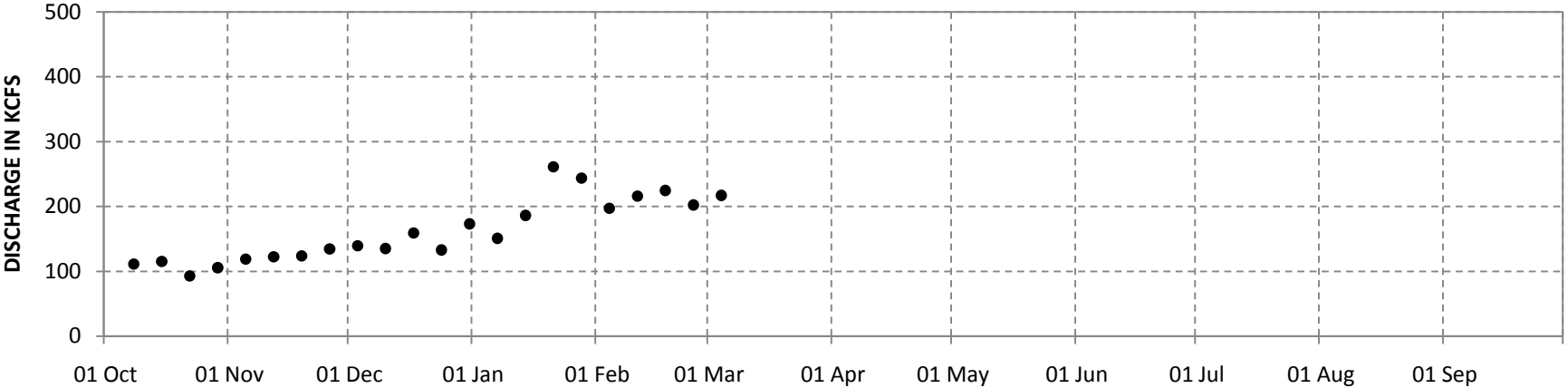


PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT BONNEVILLE DAM



— OUTFLOW — SEASONAL OBJECTIVE



— WEEKLY OBJECTIVE — SEASONAL OBJECTIVE ● WEEKLY OBSERVED — SEASONAL TO-DATE

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday March 23, 2011 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274
Access Code 3871669
Security Code 6845

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.

AGENDA

1. Welcome and Introductions
2. Review March 9 Meeting Minutes [\[Meeting Minutes\]](#)
3. Water Supply Forecast Update- Steve Barton, COE-NWD
 - a. [Westwide SNOTEL](#)
4. Vernita Bar Update - Russell Langshaw, Grant County PUD
 - a. [PRD Tailrace Temperatures](#)
5. 2011 Fish Operations Plan - Steve Barton, COE-NWD
 - a. [Spring Fish Operations Plan](#)
6. Dworshak Update - Steve Barton, COE-NWD and Steve Hall, COE-NWW
7. Spill Priority List - Scott English, COE-NWD
 - a. [Spill Priority Order](#)
8. BPA Emergency Action Plan - Tony Norris, BPA
9. Operations Review
 - a. Reservoirs

- i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality
- 10. Other
 - a. Set agenda and date for next meeting - **March 30, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Dong Baus](#) at (503) 808-3995

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 23, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Review Meeting Minutes/Notes

TMT members reviewed the 3/9 Official Meeting Minutes and Facilitator's Notes. With no suggested changes, they were considered final.

Water Supply Forecast Update

Steve Barton, COE, shared an update on water supply. Compared to the March final forecasts, which assumed 110% of normal, actuals were:

- Canadian Upper Columbia – 146% of normal
- Kootenai – 206%
- Pend Oreille – 180%
- Clearwater – 138%
- Columbia above Grand Coulee – 180%
- Snake above Ice Harbor – 183%
- The Dalles – 191%
- Snow – SNOTEL sights showed normal to above normal throughout the basin; near normal in the Canadian basin

Steve also shared information about the mid-month forecast, noting that no new snow assumptions were added and that the March water supply assumption was 95% of normal. Given those assumptions, the Grand Coulee April-September forecast was 69.2 MAF; The Dalles April-August was 97.3 MAF, 105% of normal; Libby April-August was 7.13 MAF; Lower Granite April-July was 22.5 MAF, 104% of normal; and Dworshak was 2.91 MAF, 110% of normal.

TMT members noted that precipitation was predicted to hit the basin over the next 10 days, and possibly some warming at lower elevations which may result in some runoff – all will be monitoring the conditions closely. In response to a question, Steve said Grand Coulee April flood control elevation targets would be influenced by the forecasts but that nothing had been officially set at this time.

Vernita Bar Update

Russell Langshaw, Grant County PUD, shared an update on Priest Rapids tailrace temperatures and emergence operations, noting that current projections show the end of

emergence will be around June 19. Russell said operations thus far were going well, that constraints were ranging 30-40 kcfs and there had been just one minor exceedance on 3/13 when flows dropped just below the band. Stranding and entrapment studies were in their 3rd week and so far, Russell said, the program was going well. One Chinook had been observed entrapped, and, that number was likely to increase further in to the migration season. Russell concluded with a note that field crews were finding new web based modeling was helping them focus/streamline their work.

Fish Operations Plan

Steve Barton, COE, shared an update on the 3/22 version of the FOP which had been submitted to the court and was posted to today's agenda. Rick Kruger, Oregon, raised three comments:

- Oregon had remaining concerns about the John Day spill test being planned and would discuss those concerns with SRWG over the next couple weeks as the design details get fleshed out. Concerns included schedule, number of fish released and description of the test as a performance standard instead of spill treatment comparison test.
- Spill adjustment conditions, e.g. low runoff and navigation safety, were inappropriately listed under 'TDG Management'. Why was this done? COE response: This was an oversight in the document. The heading should read 'Management of Spill for Fish Passage'.
- Changes in spill for 'non-commercial' navigation had previously been included under the general, Lower Monumental and Lower Granite sections, and in the final was included under Lower Granite. Why? How has this issue been coordinated through the region? What is the process for making spill adjustments to accommodate navigation? The concern is that there will be blanket approval for altering spill to accommodate any barge. COE response: Health and safety is a priority for the COE and they will use flexibility in operations to meet that priority. That said, the inclusion of this language in the FOP was an oversight. It was carry over language from a change form agreed to and developed at FPOM in 2010 for the Fish Passage Plan. The intent is to coordinate any proposed change to spill for navigation via the TMT, as has been done in the past.

Action/Next Steps: Steve will share the two edits with the authors of the FOP and inquire as to how changes will be made to the document, given that it has already been submitted to the court. He will loop back to TMT at the next meeting, or sooner via email.

Dworshak Operations

Steve Barton, COE, reported that Dworshak was operating 14.7 kcfs outflows and 7.3 kcfs inflows, was at elevation 1473.3' and was targeting 1451.4' by mid-April. He reminded TMT of the email sent last week confirming approval of the Walla Walla District COE deviation request allowing the project to not meet its end of March elevation target. With the increase in flows, Steve said there may be a need to increase outflows even more and, while TDG had not exceeded 110% up to this point, it was a real possibility over the coming weeks. Walla Walla's Gunnar Leffler confirmed that

TDG had not been exceeded and had actually gone down some so project flows would be increased. That said, he reiterated that TDG exceedances might occur. The various water supply forecasts for Dworshak ranged from 3.3 MAF to 2.93 MAF to 3.1 MAF.

Spill Priority List

Scott English, COE, shared a draft spill priority list that was linked to this agenda item and also directed TMT's attention to the link from the home page that includes water quality information with a link to the policy for setting the spill priority list. Paul Wagner, NOAA, on behalf of FPAC, said the salmon managers had developed a version to share with the COE but that they had been working from an older version. The two lists needed to be reconciled.

TMT discussed whether and how to include the Mid-C projects considering they are not managed for TDG by the COE but do have a water quality impact on the system. The COE is working with the PUD coordinator to gather data from each of the PUDs that can be added as useful information to the list. One option suggested today was to separate the Mid-C data on to a separate table. TMT also discussed the placement of Chief Joseph on the list, in light of the flow deflectors now fully installed and being utilized. At this point, the COE shared its preference for leaving this project toward the bottom of the list.

Action/Next Steps: Scott English will share information and an updated draft spill priority list with FPAC for their 3/29 meeting. TMT will revisit the spill priority list during a TMT conference call on 3/30.

BPA Emergency Actions Plan

TMT spent some time reviewing the Emergency Actions Plan, attached as Appendix 1 to the Water Management Plan. General comments included: The pre-emptive actions list looks good; Little Goose has a 'TSW' not 'RSW', and increasing BON PH1 to operate outside 1% might be removed from the list depending on a pending change form being developed.

Action/Next Steps: In order for BPA to confirm regional review on this document, FPAC agreed to discuss the list at an upcoming meeting and bring forth any questions or suggested changes to a later TMT meeting. This item will be added to the 4/20 TMT agenda.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects: Grand Coulee was at elevation 1253.5' and operating for drum gate maintenance. The project may draft significantly for flood control in April – currently the April 30 flood control target is 1237' and John said Reclamation was monitoring water supply conditions very closely, noting that the flood control target could drop 10 feet or more depending on the final April water supply forecast. Hungry Horse was at elevation 3505.8', with 8.3 kcfs outflows, targeting to be at or below flood control elevations. Again, he noted, the project may need to increase flows based on future precipitation and water supply forecasts. Steve Barton, COE, reported on projects: Libby was at elevation 2371.0', with 2.9 kcfs

inflows and 18 kcfs outflows. The project was targeting elevation 2364.3' by the end of March. Albeni Falls was operating at 24.6 kcfs inflows and 26.4 kcfs outflows, and was currently at elevation 2055.6'. Dworshak was at elevation 1473.3', with 7.3 kcfs inflows and 14.7 kcfs outflows. Lower Granite day average outflows were 72.3 kcfs/72.0 kcfs weekly average; Priest Rapids day average flows were 127.8 kcfs/114.0 kcfs week average; McNary day average outflows were 184.3 kcfs/209.3 kcfs week average; and Bonneville day average outflows were 204.7 kcfs/227.4 kcfs week average.

Fish – Paul Wagner, NOAA, reported that juvenile sampling had begun for the season at Bonneville and at the traps in the tributaries. So far, most counts were hatchery releases. Bonneville saw 9,400 yearlings and about 20,000 subyearlings; some coho and few steelhead; and 1,700 lamprey. Adult Chinook counts at Bonneville were 77; and 2,606 holdover Steelhead were counted at Lower Granite. The adult run forecasts were looking strong for 2011. Russ Kiefer, Idaho, reported on kokanee entrainment concerns and the challenge to finding options for addressing them. He added that the additional snow pack in the region would be good for those kokanee in the reservoir.

Power system – Nothing to report at this time.

Water quality – Scott English, COE, reported that more fixed monitoring stations were coming on line.

Next Meeting, Conference Call March 30, 9:00 am

Agenda items include:

- Dworshak operations update
- Spill priority list reconciliation
- MOP operations
- FOP process feedback

April 6 Face to Face Meeting

Agenda items include:

- Hanford Reach Update
- Water Supply Forecasts
- Dworshak Operations
- Grand Coulee Operations
- Snake River Spill Upper Snake Flow Augmentation Estimates (tentative)
- Chum Emergence (?)
- Operations Review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

March 23, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of USFWS, BPA, COE, Oregon, NOAA, BOR, Montana, Washington, the Colville Tribe, Idaho, CRITFC/Umatilla Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Review Meeting Minutes for March 9, 2011

There were no comments today on either the facilitator's notes or the official minutes for March 9, so they were deemed final.

3. Water Supply Forecast Update

Precipitation: Steve Barton reported. In contrast to the RFC March final forecast, which assumed 110% of normal precipitation for the rest of March, actual precipitation levels for March 1-21 were much higher:

- Canadian upper Columbia – 146% of normal
- Kootenai – 206% of normal
- Pend Oreille – Spokane – 180% of normal
- Clearwater – 138% of normal
- Columbia above Grand Coulee – 180%% of normal
- Snake above Ice Harbor – 183%% of normal
- The Dalles – 191% of normal

Snow pack: All basins except one in central Washington are experiencing normal to above normal snow pack. Canadian snow pack is around normal, ranging from 91% of normal near Revelstoke Dam to 116% of normal in the Okanogan. Basins with the heaviest snow pack are:

- Flathead – 130% of normal
- U.S. Kootenai – 125% of normal
- Clearwater – 111% of normal

The RFC mid-month forecast issued March 17 includes observed precipitation through March 14, but not snow, Barton noted. The mid-month forecast assumes 95% of normal precipitation for the rest of March, despite the

fact that precipitation in the first 3 weeks of March was much higher than expected. Highlights of the RFC mid-month March forecast are:

- Grand Coulee – April-September, 69.2 maf
- The Dalles – April-August, 97.3 maf, 105% of normal (January-July, 112 maf, 104% of normal)
- Libby – Apr-August, 7.13 maf, 114% of normal, (COE forecast is 7.1 maf)
- Lower Granite April-July, 22.5 maf, 104% of normal
- Dworkshak – April-July, 2.91 maf, 110% of normal,

Rick Kruger, Oregon, and Charles Morrill, Washington, both questioned the 95% of normal precipitation assumption, noting that a series of storms is predicted over the next 10 days. Barton recommended weighing the assumptions that went into the forecast in light of that prediction.

4. Vernita Bar Update

Russell Langshaw, Grant PUD, reported that temperatures have dropped below the mean values, with a normal warming trend for this time of year. If that trend continues, protections are expected to end around June 19. Operations have been going well, with constraints in the 30-40 kcfs range. The mean daily delta last week was 28.6 kcfs and constraints were 38.3 kcfs. There was a minor exceedance on March 13 when flows dropped 0.2 kcfs below the flow band.

Crews have been sampling for approximately three weeks and have found only one entrapment with Chinook to date, but the number of entrapped fish is expected to pick up as the number of juveniles increases. Grant PUD has a web-based model that targets sampling sites so the crews only visit sites that have experienced an elevation drop greater than 15 centimeters. This ensures they are efficient and only visit sites that had a large enough drop to create entrapments. This process is working very well. Langshaw will give another update on April 6.

5. 2011 Fish Operations Plan

The final spring FOP linked to today's agenda is the version filed with the court yesterday, Barton reported. The COE has not yet received a response from the court.

Rick Kruger, Oregon, made two comments for the record:

1. Oregon has a concern that pooling of control groups will introduce a bias in variability. The COE's initial proposal for a performance standards test at John Day at 30% spill drew objections from Oregon and the Nez Perce Tribe, so the operation was changed to a performance standards test at 30% and 40%. That's in 4-day blocks of 30% for 2 days then 40% for 2

days. To provide an adequate sample size for both spill treatments, the sample size has been doubled. However, the control group size has not doubled and will consist of fish from both the 30% and 40% spill group, thus Oregon's concern about the study validity.

2. With a minor change in the study design, it would be possible to analyze data to compare spill treatments with what's already planned, rather than do a performance test at John Day. Oregon believes the 30% and 40% blocks of 2 days each should be randomized in order to make the study more robust. Single-group analysis of fish spilled under both treatments would allow a spill comparison without the use of control fish. Kruger plans to raise this concern at SRWG.

Kruger also pointed out that the discussion of navigation safety, generation unit outages, power system emergencies and lack of power demand were listed in previous FOPs under Spill Operations, while in this FOP they're under TDG Management on page 2. Barton explained that was due to a reformatting error in moving back to the context of spring 2010. The corrected section should have been titled "Management of Spill for Fish Passage." Another correction has to do with 3 references to spill cessation for non-commercial navigation, 2 of which were deleted while 1 remains in the FOP. The COE intended to delete the reference to "non-commercial" navigation and the inclusion in the FOP was an oversight. Barton noted that the COE's first priority is always human health and safety on the river.

6. Dworshak Update

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Scott English	COE
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Tom Lorz	CRITFC/Umatilla

Phone:

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Dave Benner	FPC
Richelle Beck	DRA
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Russ George
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Glen Trager
Kara Kelly
Mike Butchko
Doug Vine
Tom Le
XX
Russ Kiefer
Eric Trautman
Gunnar Leffler

WMC
Consultant
Iberdrola
GP Morgan
Powerex
Thompson Reuters
Puget Sound Energy
Colorado Energy
Idaho
BP
COE

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 23, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Review Meeting Minutes/Notes

TMT members reviewed the 3/9 Official Meeting Minutes and Facilitator's Notes. With no suggested changes, they were considered final.

Water Supply Forecast Update

Steve Barton, COE, shared an update on water supply. Compared to the March final forecasts, which assumed 110% of normal, actual precipitation values for the period March 1 -21 for various points within the Columbia River Basin were:

- Canadian Upper Columbia – 146% of normal
- Kootenai – 206%
- Pend Oreille – 180%
- Clearwater – 138%
- Columbia above Grand Coulee – 180%
- Snake above Ice Harbor – 183%
- The Dalles – 191%
- Snow – SNOTEL sights showed normal to above normal throughout the basin; near normal in the Canadian basin

Steve also shared information about the mid-month forecast, noting that no new snow assumptions were added and that the March precipitation assumption for the second half of March was 95% of normal. Given those assumptions, the Grand Coulee April-September forecast was 69.2 MAF; The Dalles April-August was 97.3 MAF, 105% of normal; Libby April-August was 7.13 MAF; Lower Granite April-July was 22.5 MAF, 104% of normal; and Dworshak was 2.91 MAF, 110% of normal.

TMT members noted that precipitation was predicted to hit the basin over the next 10 days, and possibly some warming at lower elevations which may result in some runoff – all will be monitoring the conditions closely. In response to a question, Steve said Grand Coulee April flood control elevation targets would be influenced by the forecasts but that nothing had been officially set at this time.

Vernita Bar Update

Russell Langshaw, Grant County PUD, shared an update on Priest Rapids' tailrace temperatures and emergence operations, noting that current projections show the end of emergence will be around June 19. Russell said operations thus far were going well, that constraints were ranging 30-40 kcfs and there had been just one minor exceedance on 3/13 when flows dropped just below the band. Stranding and entrapment studies were in their 3rd week and so far, Russell said, the program was going well. One Chinook had been observed entrapped, and, that number was likely to increase further into the migration season. Russell concluded with a note that field crews were finding that the new web based modeling tool was helping them focus/streamline their work.

Fish Operations Plan

Steve Barton, COE, shared an update on the 3/22 version of the FOP which had been submitted to the court and was posted to today's agenda. Rick Kruger, Oregon, raised three comments:

- Oregon had remaining concerns about the John Day spill test being planned and would discuss those concerns with SRWG over the next couple weeks as the design details get fleshed out. Concerns included schedule, number of fish released and description of the test as a performance standard instead of spill treatment comparison test.
- Spill adjustment conditions, e.g. low runoff and navigation safety, were inappropriately listed under 'TDG Management'. Why was this done? COE response: This was an oversight in the document. The heading should read 'Management of Spill for Fish Passage'.
- Changes in spill for 'non-commercial' navigation had previously been included under the general, Lower Monumental and Lower Granite sections, and in the final was included under Lower Granite. Why? How has this issue been coordinated through the region? What is the process for making spill adjustments to accommodate navigation? The concern is that there will be blanket approval for altering spill to accommodate any vessel. COE response: Health and safety is a priority for the COE and they will use flexibility in operations to meet that priority. That said, the inclusion of this language in the FOP was an oversight. It was carry over language from a change form agreed to and developed at FPOM in 2010 for the Fish Passage Plan. The intent is to coordinate any proposed change to spill for navigation via the TMT, as has been done in the past.

Action/Next Steps: Steve will share the two edits with the authors of the FOP and inquire as to how changes will be made to the document, given that it has already been submitted to the court. He will loop back to TMT at the next meeting, or sooner via email.

Dworshak Operations

Steve Barton, COE, reported that Dworshak was operating 14.7 kcfs outflows and 7.3 kcfs inflows, was at elevation 1473.3' and was targeting 1451.4' by mid-April. He reminded TMT of the email sent last week confirming approval of the Walla Walla District COE deviation request allowing the project to not meet its end of March elevation target. With the increase in flows, Steve said there may be a need to increase

outflows even more and, while TDG had not exceeded 110% up to this point, it was a real possibility over the coming weeks. Walla Walla's Gunnar Leffler confirmed that TDG had not been exceeded and had actually gone down some so project flows would be increased. That said, he reiterated that TDG exceedances might occur. The various water supply forecasts for Dworshak ranged from 3.3 MAF to 2.93 MAF to 3.1 MAF.

Spill Priority List

Scott English, COE, shared a draft spill priority list that was linked to this agenda item and also directed TMT's attention to the link from the home page that includes water quality information with a link to the policy for setting the spill priority list. Paul Wagner, NOAA, on behalf of FPAC, said the salmon managers had developed a version to share with the COE but that they had been working from an older version. The two lists needed to be reconciled.

TMT discussed whether and how to include the Mid-C projects considering they are not managed for TDG by the COE but do have a water quality impact on the system. The COE is working with the PUD coordinator to gather data from each of the PUDs that can be added as useful information to the list. One option suggested today was to separate the Mid-C data on to a separate table. TMT also discussed the placement of Chief Joseph on the list, in light of the flow deflectors now fully installed and being utilized. At this point, the COE shared its preference for leaving this project toward the bottom of the list.

Action/Next Steps: Scott English will share information and an updated draft spill priority list with FPAC for their 3/29 meeting. TMT will revisit the spill priority list during a TMT conference call on 3/30.

BPA Emergency Actions Plan

TMT spent some time reviewing the Emergency Actions Plan, attached as Appendix 1 to the Water Management Plan. General comments included: The pre-emptive actions list looks good; Little Goose has a 'TSW' not 'RSW', and increasing BON PH1 to operate outside 1% might be removed from the list depending on a pending change form being developed.

Action/Next Steps: In order for BPA to confirm regional review on this document, FPAC agreed to discuss the list at an upcoming meeting and bring forth any questions or suggested changes to a later TMT meeting. This item will be added to the 4/20 TMT agenda.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects: Grand Coulee was at elevation 1253.5' and operating for drum gate maintenance. The project may draft significantly for flood control in April – currently the April 30 flood control target is 1237' and John said Reclamation was monitoring water supply conditions very closely, noting that the flood control target could drop 10 feet or more depending on the final April water supply forecast. Hungry Horse was at elevation 3505.8', with 8.3 kcfs outflows, targeting to be at or below flood control elevations. Again, he noted, the project

may need to increase flows based on future precipitation and water supply forecasts. Steve Barton, COE, reported on projects: Libby was at elevation 2371.0', with 2.9 kcfs inflows and 18 kcfs outflows. The project was targeting elevation 2364.3' by the end of March. Albeni Falls was operating at 24.6 kcfs inflows and 26.4 kcfs outflows, and was currently at elevation 2055.6'. Dworshak was at elevation 1473.3', with 7.3 kcfs inflows and 14.7 kcfs outflows. Lower Granite day average outflows were 72.3 kcfs/72.0 kcfs weekly average; Priest Rapids day average flows were 127.8 kcfs/114.0 kcfs week average; McNary day average outflows were 184.3 kcfs/209.3 kcfs week average; and Bonneville day average outflows were 204.7 kcfs/227.4 kcfs week average.

Fish – Paul Wagner, NOAA, reported that juvenile sampling had begun for the season at Bonneville and at the traps in the tributaries. So far, most counts were hatchery releases. Bonneville saw 9,400 yearlings and about 20,000 subyearlings; some coho and few steelhead; and 1,700 lamprey. Adult Chinook counts at Bonneville were 77; and 2,606 holdover Steelhead were counted at Lower Granite. The adult run forecasts were looking strong for 2011. Russ Kiefer, Idaho, reported on kokanee entrainment concerns and the challenge to finding options for addressing them. He added that the additional snow pack in the region would be good for those kokanee in the reservoir.

Power system – Nothing to report at this time.

Water quality – Scott English, COE, reported that more fixed monitoring stations were coming on line.

Next Meeting, Conference Call March 30, 9:00 am

Agenda items include:

- Dworshak operations update
- Spill priority list reconciliation
- MOP operations
- FOP process feedback

April 6 Face to Face Meeting

Agenda items include:

- Hanford Reach Update
- Water Supply Forecasts
- Dworshak Operations
- Grand Coulee Operations
- Snake River Spill Upper Snake Flow Augmentation Estimates (tentative)
- Chum Emergence (?)
- Operations Review
- Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

March 23, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of USFWS, BPA, COE, Oregon, NOAA, BOR, Montana, Washington, the Colville Tribe, Idaho, CRITFC/Umatilla Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Review Meeting Minutes for March 9, 2011

There were no comments today on either the facilitator's notes or the official minutes for March 9, so they were deemed final.

3. Water Supply Forecast Update

Precipitation: Steve Barton reported. In contrast to the RFC March final forecast, which assumed 110% of normal precipitation for the rest of March, actual precipitation levels for March 1-21 were much higher:

- Canadian upper Columbia – 146% of normal
- Kootenai – 206% of normal
- Pend Oreille – Spokane – 180% of normal
- Clearwater – 138% of normal
- Columbia above Grand Coulee – 180%% of normal
- Snake above Ice Harbor – 183%% of normal
- The Dalles – 191% of normal

Snow pack: All basins except one in central Washington are experiencing normal to above normal snow pack. Canadian snow pack is around normal, ranging from 91% of normal near Revelstoke Dam to 116% of normal in the Okanogan. Basins with the heaviest snow pack are:

- Flathead – 130% of normal
- U.S. Kootenai – 125% of normal
- Clearwater – 111% of normal

The RFC mid-month forecast issued March 17 includes observed precipitation through March 14, but not snow, Barton noted. The mid-month forecast assumes 95% of normal precipitation for the rest of March, despite the

fact that precipitation in the first 3 weeks of March was much higher than expected. Highlights of the RFC mid-month March forecast are:

- Grand Coulee – April-September, 69.2 maf
- The Dalles – April-August, 97.3 maf, 105% of normal (January-July, 112 maf, 104% of normal)
- Libby – Apr-August, 7.13 maf, 114% of normal, (COE forecast is 7.1 maf)
- Lower Granite April-July, 22.5 maf, 104% of normal
- Dworkshak – April-July, 2.91 maf, 110% of normal,

Rick Kruger, Oregon, and Charles Morrill, Washington, both questioned the 95% of normal precipitation assumption, noting that a series of storms is predicted over the next 10 days. Barton recommended weighing the assumptions that went into the forecast in light of that prediction.

4. Vernita Bar Update

Russell Langshaw, Grant PUD, reported that temperatures have dropped below the mean values, with a normal warming trend for this time of year. If that trend continues, protections are expected to end around June 19. Operations have been going well, with constraints in the 30-40 kcfs range. The mean daily delta last week was 28.6 kcfs and constraints were 38.3 kcfs. There was a minor exceedance on March 13 when flows dropped 0.2 kcfs below the flow band.

Crews have been sampling for approximately three weeks and have found only one entrapment with Chinook to date, but the number of entrapped fish is expected to pick up as the number of juveniles increases. Grant PUD has a web-based model that targets sampling sites so the crews only visit sites that have experienced an elevation drop greater than 15 centimeters. This ensures they are efficient and only visit sites that had a large enough drop to create entrapments. This process is working very well. Langshaw will give another update on April 6.

5. 2011 Fish Operations Plan

The final spring FOP linked to today's agenda is the version filed with the court yesterday, Barton reported. The COE has not yet received a response from the court.

Rick Kruger, Oregon, made two comments for the record:

1. Oregon has a concern that pooling of control groups will introduce a bias in variability. The COE's initial proposal for a performance standards test at John Day at 30% spill drew objections from Oregon and the Nez Perce Tribe, so the operation was changed to a performance standards test at 30% and 40%. That's in 4-day blocks of 30% for 2 days then 40% for 2

days. To provide an adequate sample size for both spill treatments, the sample size has been doubled. However, the control group size has not doubled and will consist of fish from both the 30% and 40% spill group, thus Oregon's concern about the study validity.

2. With a minor change in the study design, it would be possible to analyze data to compare spill treatments with what's already planned, rather than do a performance test at John Day. Oregon believes the 30% and 40% blocks of 2 days each should be randomized in order to make the study more robust. Single-group analysis of fish spilled under both treatments would allow a spill comparison without the use of control fish. Kruger plans to raise this concern at SRWG.

Kruger also pointed out that the discussion of navigation safety, generation unit outages, power system emergencies and lack of power demand were listed in previous FOPs under Spill Operations, while in this FOP they're under TDG Management on page 2. Barton explained that was due to a reformatting error in moving back to the context of spring 2010. The corrected section should have been titled "Management of Spill for Fish Passage." Another correction has to do with 3 references to spill cessation for non-commercial navigation, 2 of which were deleted while 1 remains in the FOP. The COE intended to delete the reference to "non-commercial" navigation and the inclusion in the FOP was an oversight. Barton noted that the COE's first priority is always human health and safety on the river.

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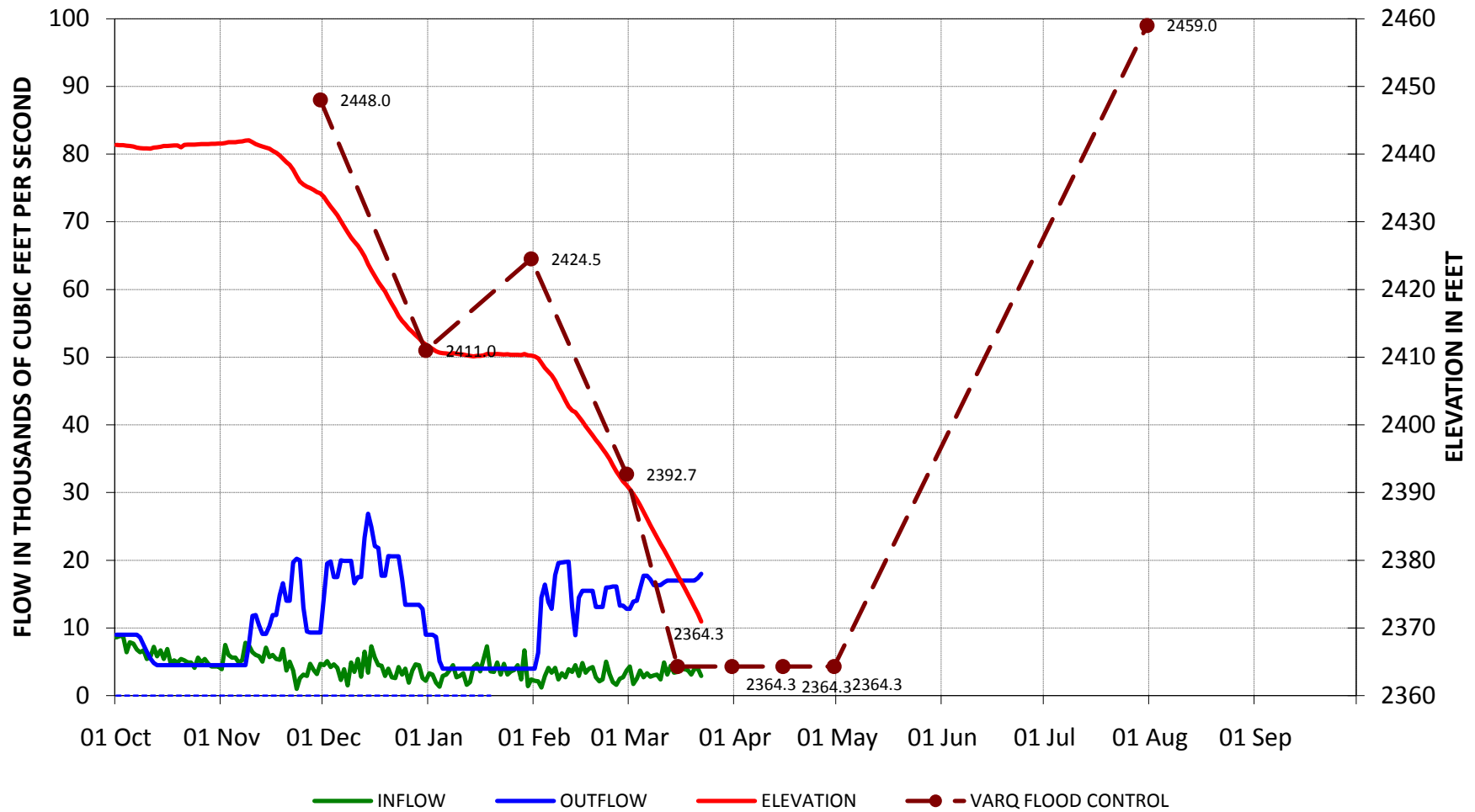
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BP
COE

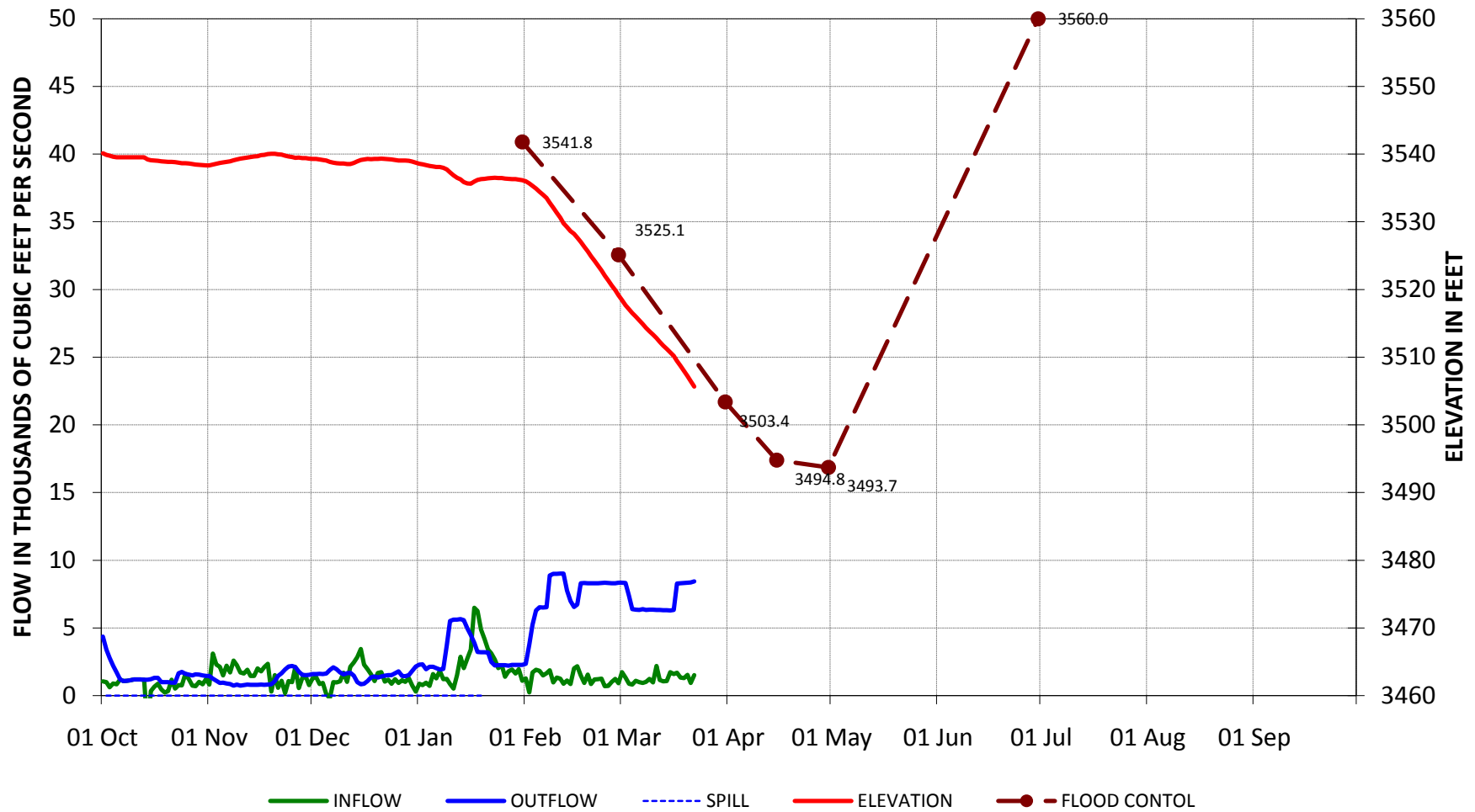
LIBBY DAM AND RESERVOIR

Water Year 2011



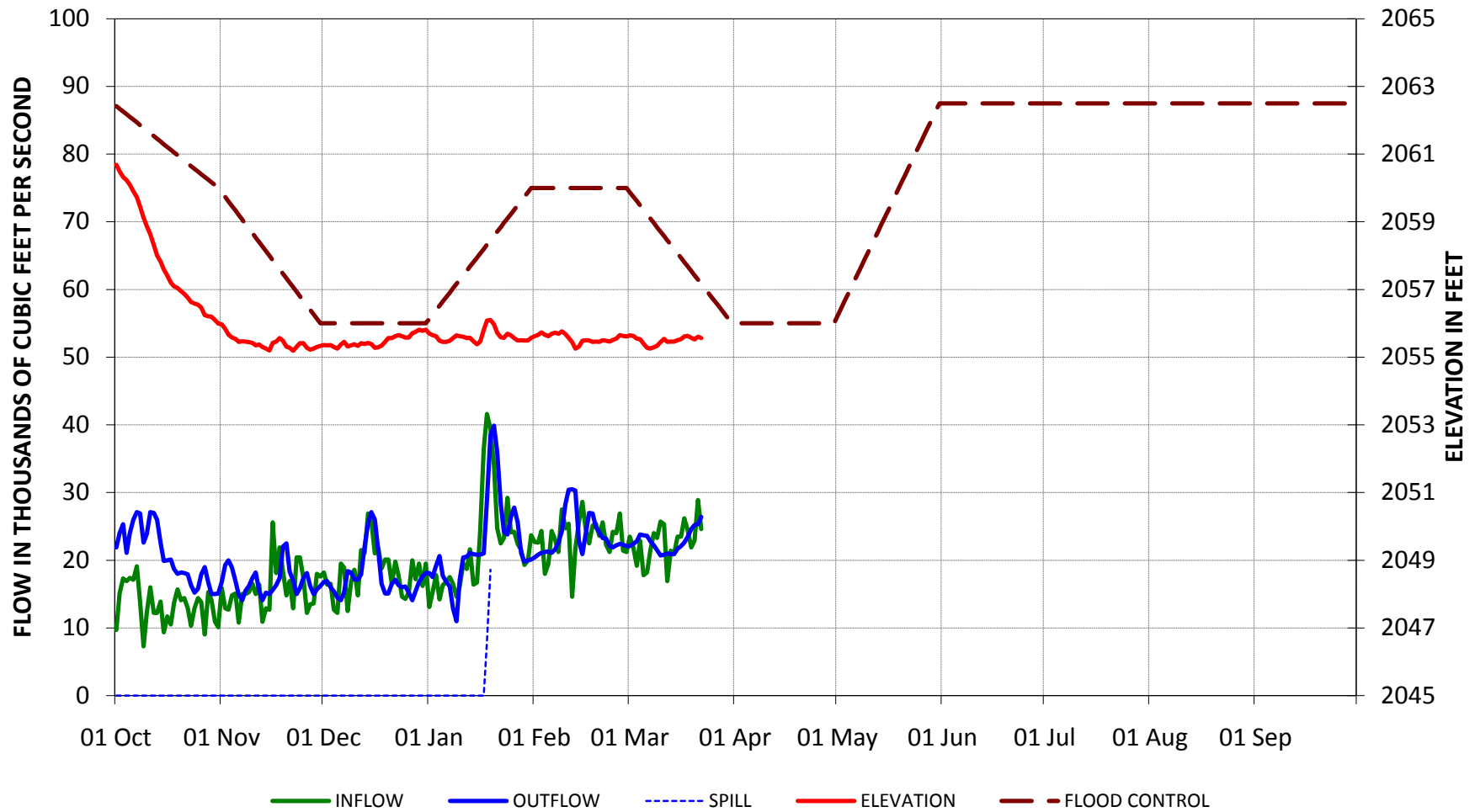
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Water Year 2011



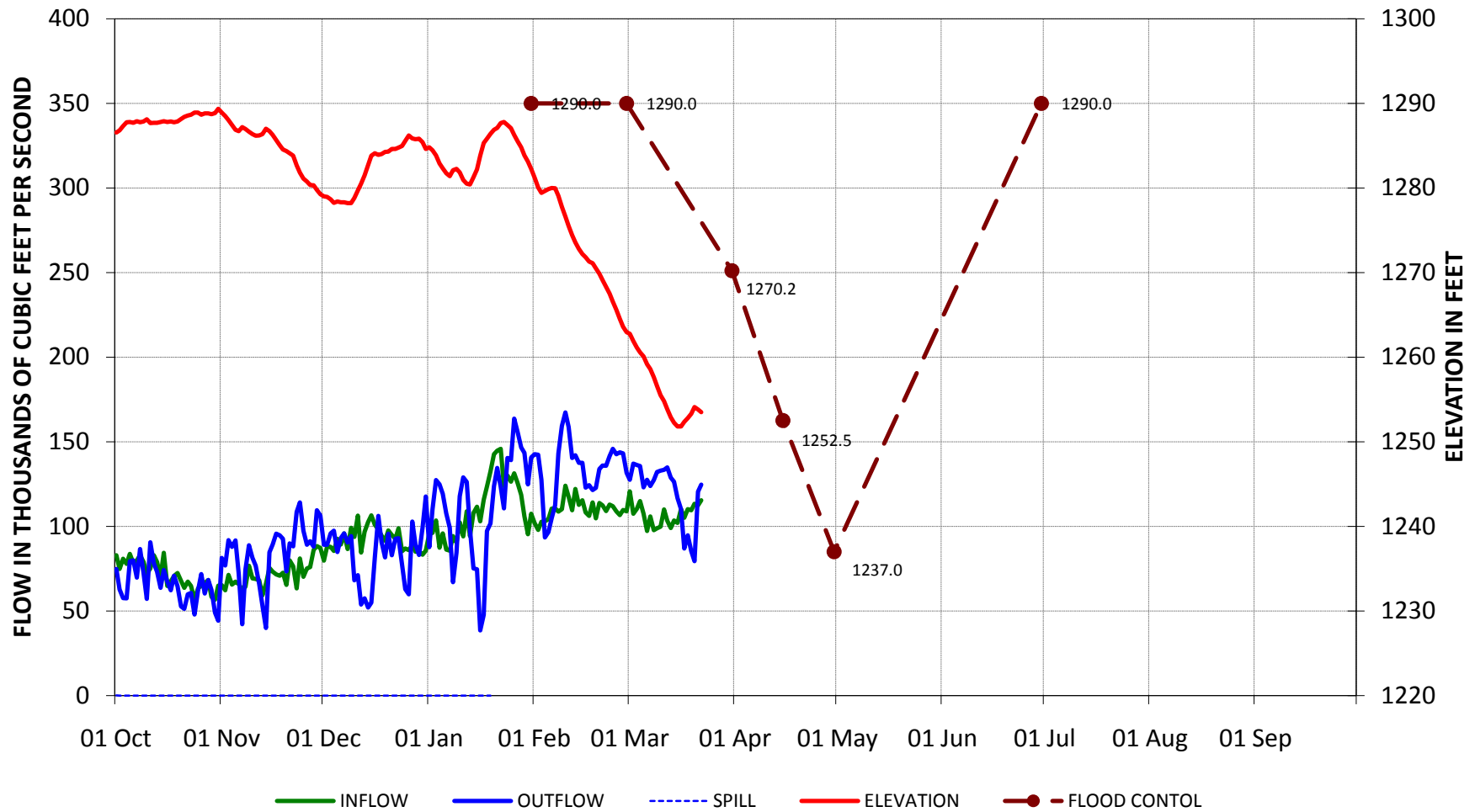
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Water Year 2011



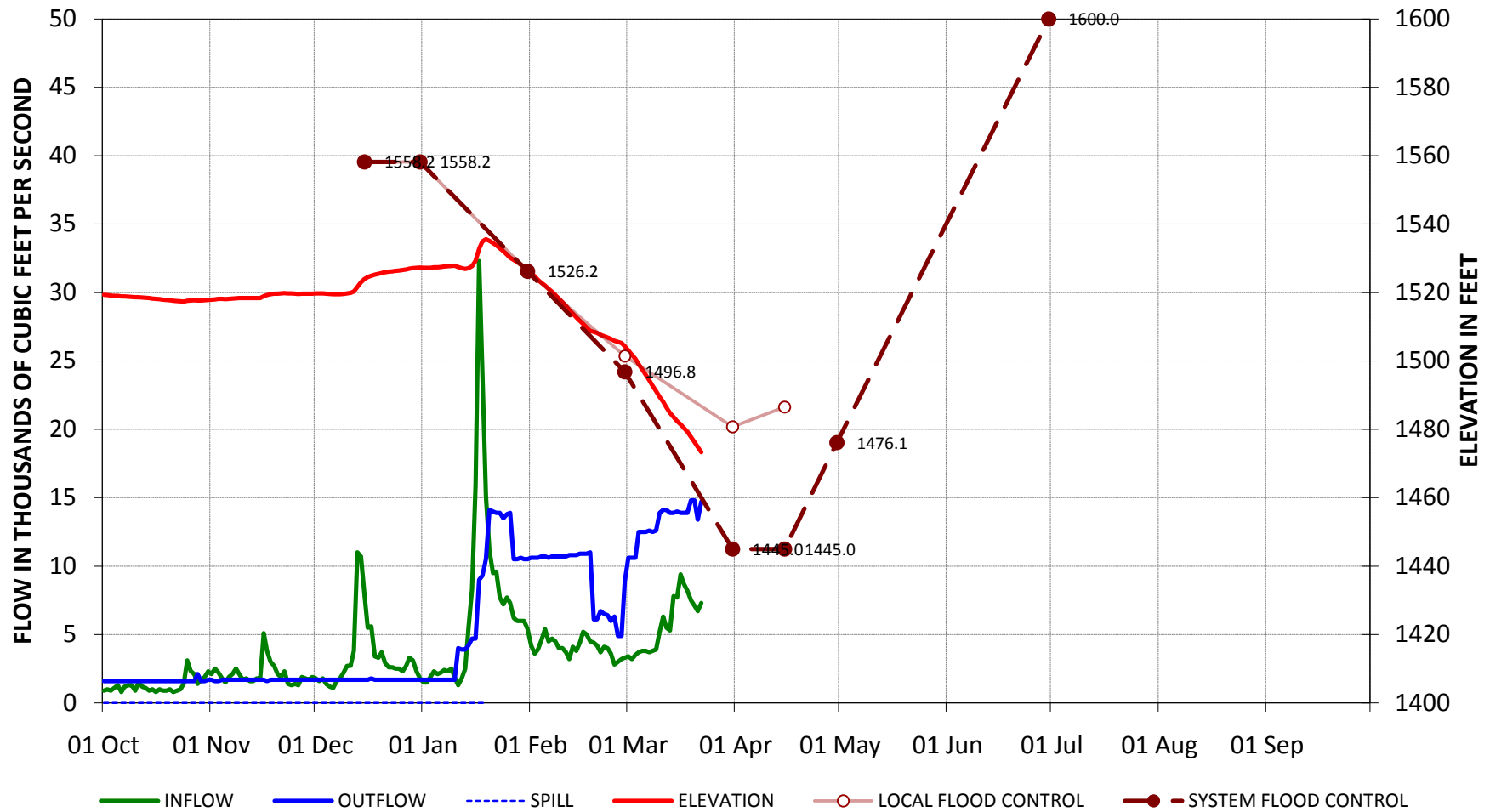
GRAND COULEE DAM AND RESERVOIR

Water Year 2011



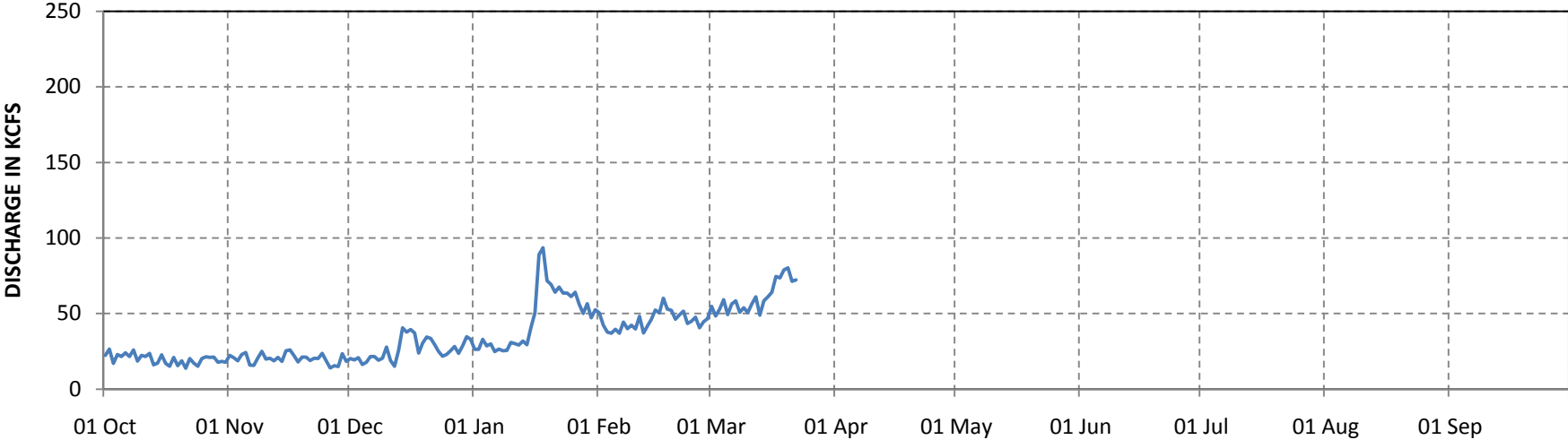
DWORSHAK DAM AND RESERVOIR

Water Year 2011

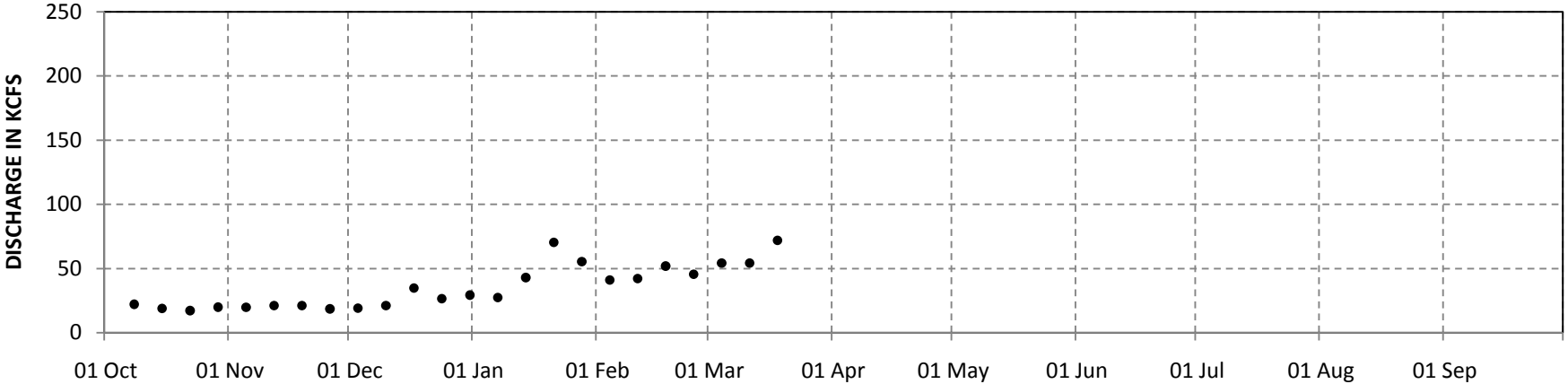


PROJECT DISCHARGE SUMMARY

SNAKE RIVER AT LOWER GRANITE DAM



OUTFLOW SEASONAL OBJECTIVE



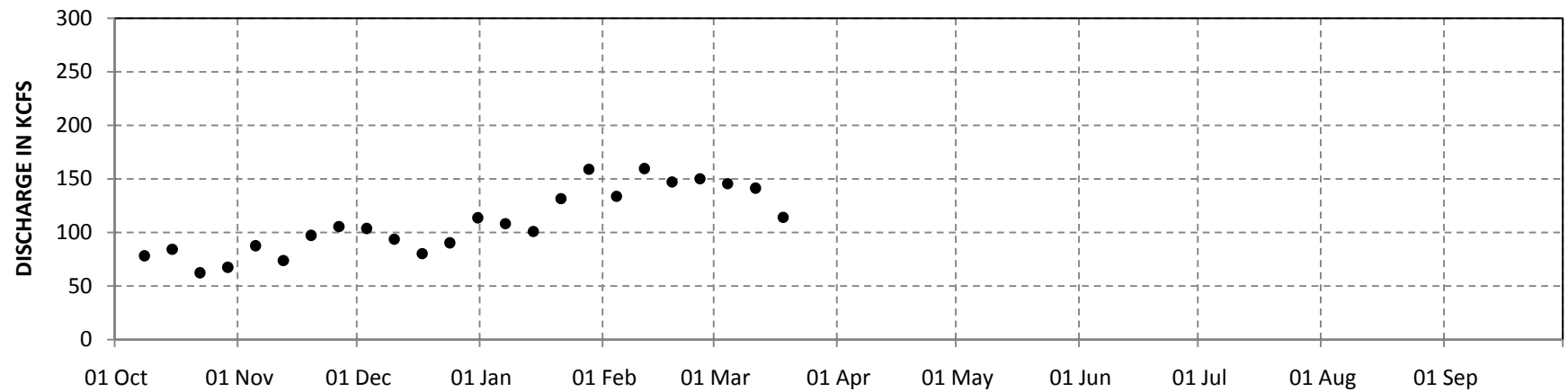
WEEKLY OBJECTIVE SEASONAL OBJECTIVE WEEKLY OBSERVED SEASONAL TO-DATE

PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



— OUTFLOW

— SEASONAL OBJECTIVE



— WEEKLY OBJECTIVE

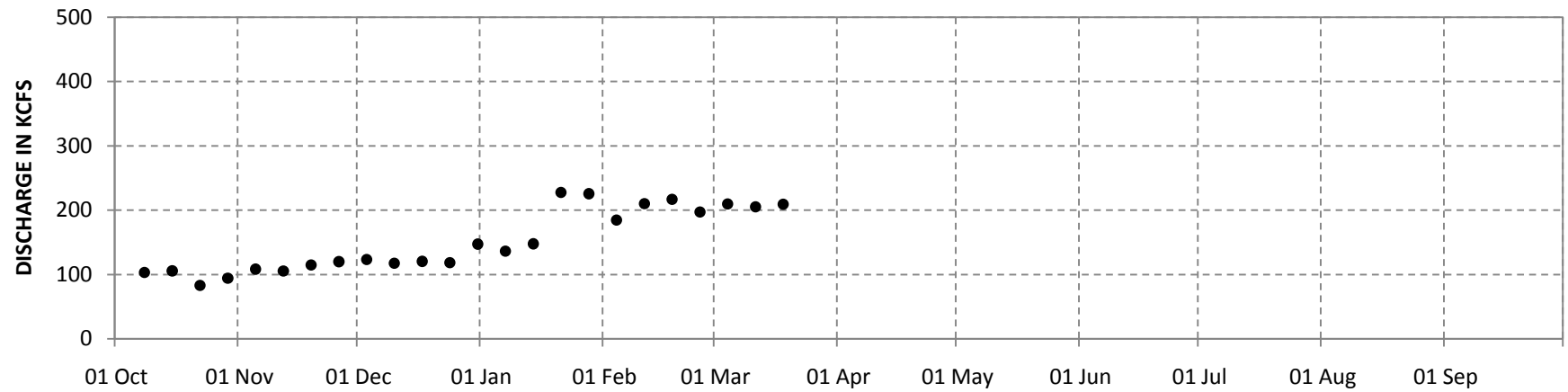
— SEASONAL OBJECTIVE

● WEEKLY OBSERVED

— SEASONAL TO-DATE

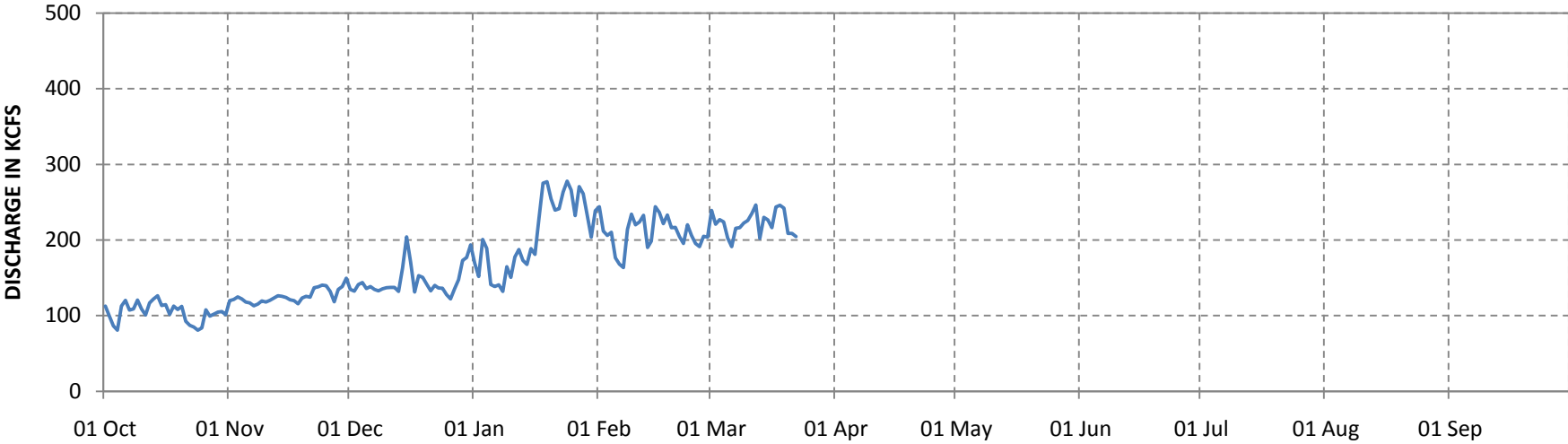
PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM

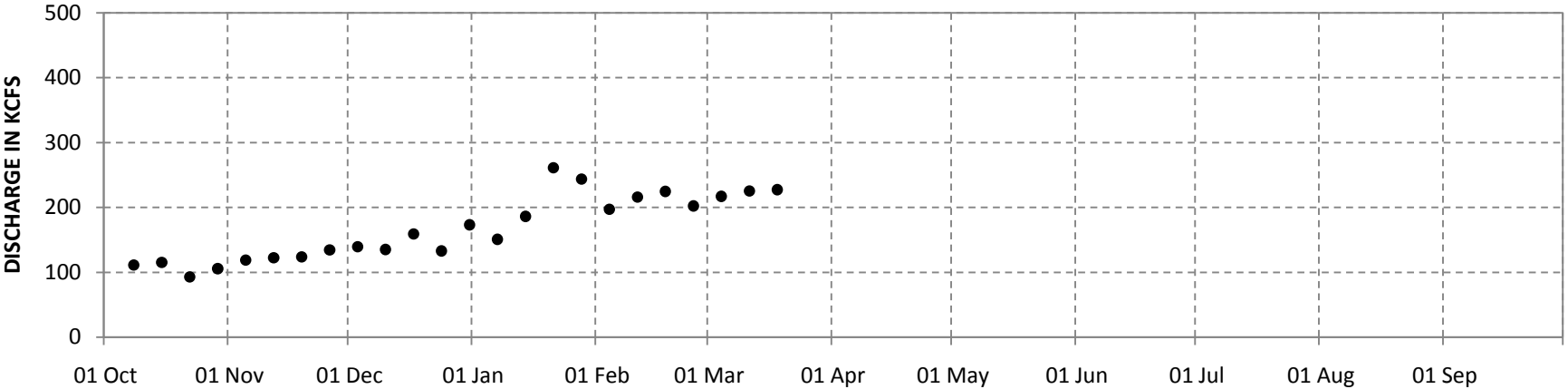


PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT BONNEVILLE DAM



— OUTFLOW — SEASONAL OBJECTIVE



— WEEKLY OBJECTIVE — SEASONAL OBJECTIVE ● WEEKLY OBSERVED — SEASONAL TO-DATE

PRO-----TDG%-TDG%-TDG%-TDG%-TDG%--TDG%
JECT---110--115--120--125--130---135

LWG-----20---30----41----90--125---200-- * Changes
LGS(DAY)10---15----32----80--150---250--
MCN-----40---80---145---230--290---450--
LMN-----10---15----26----95--180---250--
IHR-----30---45----95---125--180---240--
LGS(NIGHT)10-15----32----80--150---250--
MID C---??---??----??----??---??-----
TDA-----20---60---125---250--360---600--
BON-----50---65---100---150--225---270-
JDA-----20---60---120---240--450---600-
CHJ-----20---50---100---130--165---200--
GCL(a)--0-----5----10---20---35----50--
GCL(b)--0----15----30----75---120--130--
DWR----37%--42%---50%---60%----70%-----

CENWD-PDD

March 2011

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 $\pm 1\%$ of the target percentage for the following hour (or more than $\pm 1\%$ 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 $\pm 1\%$ 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 $\pm 1\%$ 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 $\pm 1\%$ 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 $\pm 1\%$ 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 $\pm 1\%$ of best efficiency range to operating one unit at the high end of the $\pm 1\%$ 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 $\pm 1\%$ 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 $\pm 1\%$ 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 than 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 $\pm 1\%$ 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 (STs) 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.

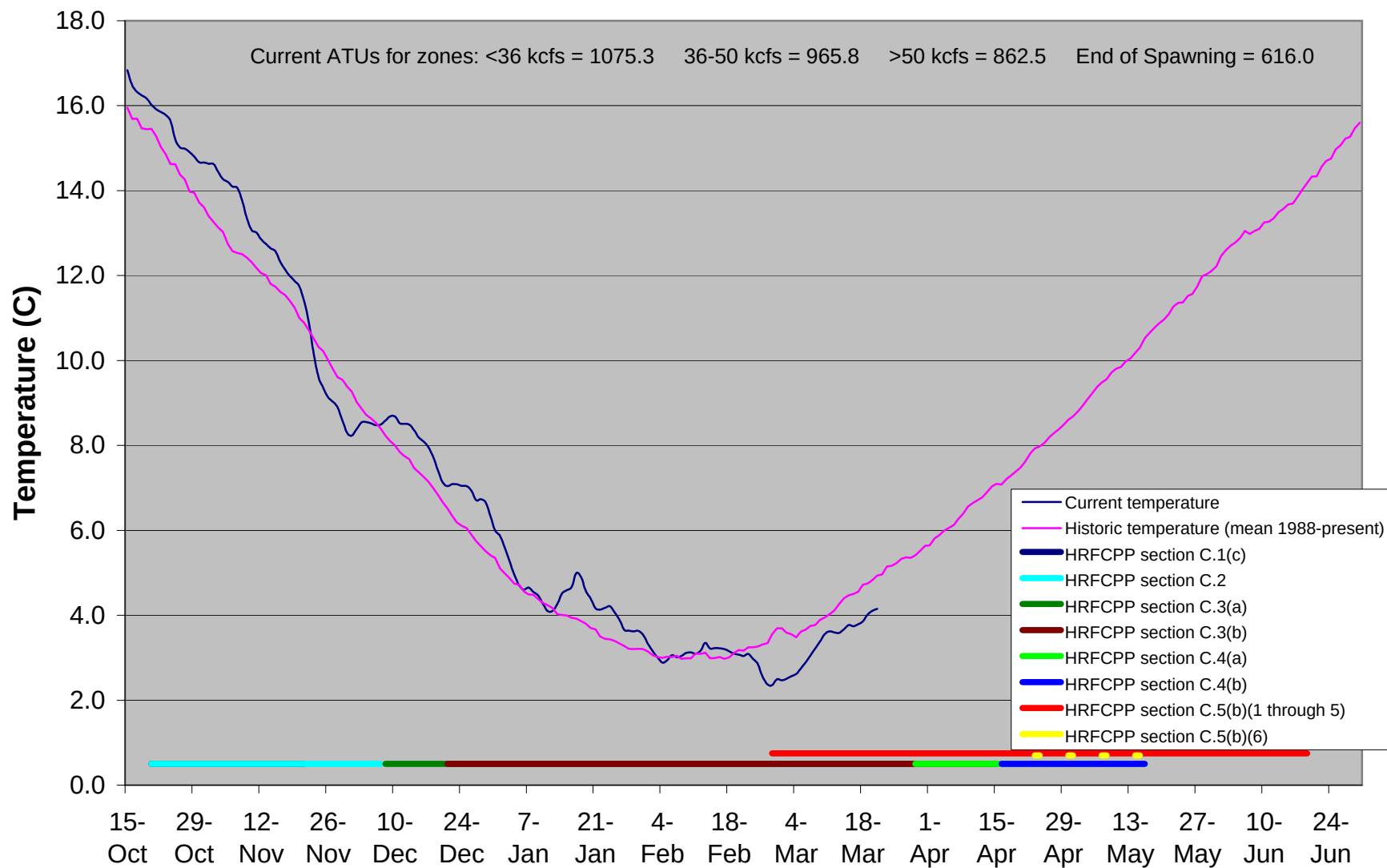
The updates will also provide information on substantial issues that arise as a result of the spill program (e.g. Little Goose adult passage issues in 2005 and 2007), and will address any emergency situations that arise.

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>

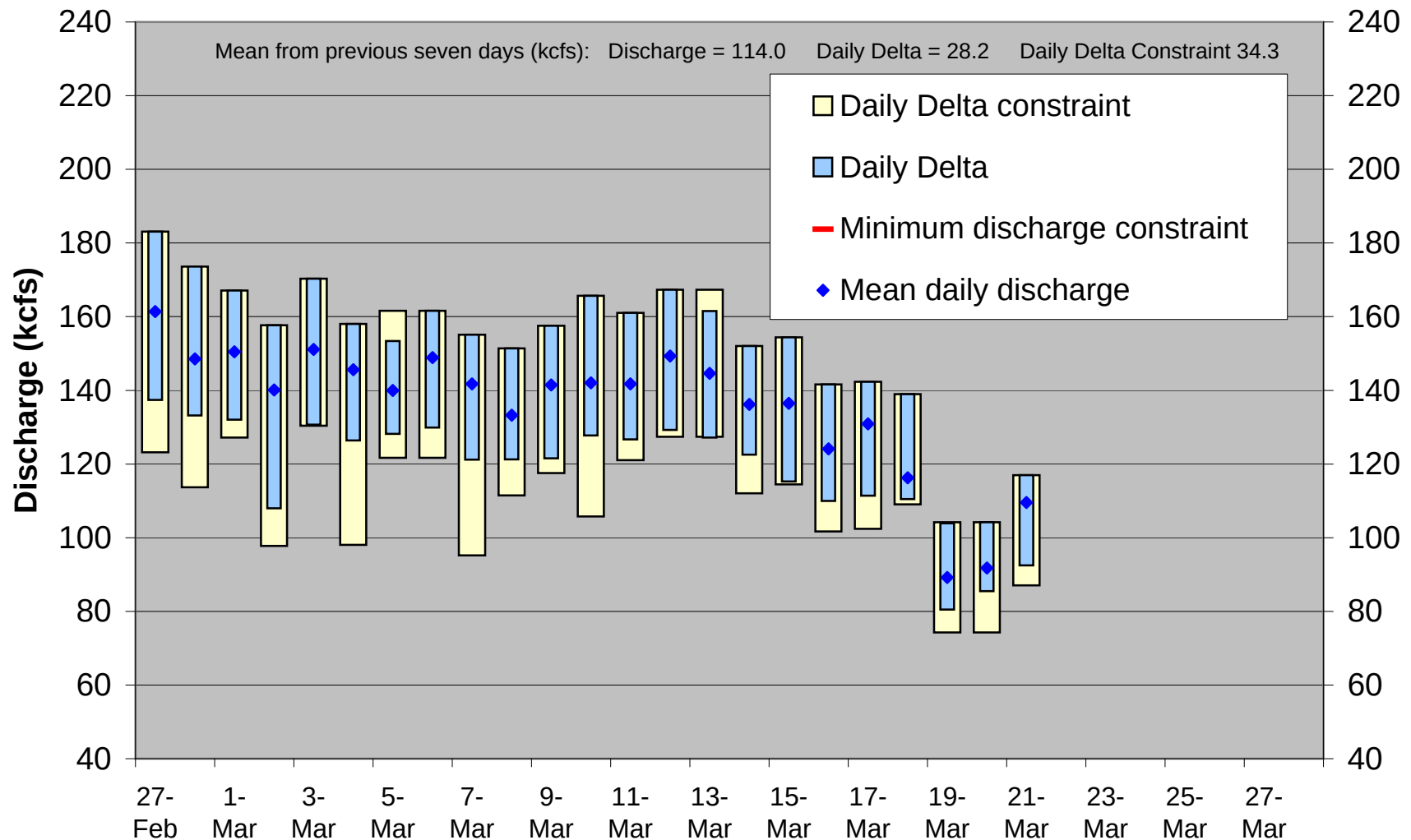
- Water Quality: TDG and water temperature data are posted to the following website every hour: <http://www.nwd-wc.usace.army.mil/report/total.html>. These data are received via satellite from fixed monitoring sites in the Columbia and Snake rivers every hour, and placed on a Corps public website upon 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/

2010-2011 PRD Tailrace Temperatures and HRF CPP constraints



Priest Rapids Dam Operations 2011

Number of exceedances: 1



TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday March 30, 2011 9:00am - 12:00pm

NOAA Fisheries
1201 NE Lloyd Blvd, Suite 1100, Columbia Room
Portland, OR 97232

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. SOR 2011-01 - Lower Granite Pool Held at MOP Plus 2 Feet April Through August - Glenn Vanselow, Pacific Northwest Waterways Association
 - a. [SOR 2011-01](#)
3. Dworshak Operations Update - Steve Barton, COE-NWD and Steve Hall, COE-NWW
4. Spill Priority List - Scott English, COE-NWD
 - a. [Spill Priority Order](#)
5. MOP Operations - Steve Barton, COE-NWD
6. FOP Process Feedback - Steve Barton, COE-NWD
7. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System
 - d. Water Quality

8. Other

- a. Set agenda and date for next meeting - **April 6, 2011**
- b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Dong Baus](#) at (503) 808-3995

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 30, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Operations Update

Tony Norris, BPA, reported that the FCRPS would begin lack of market spill later today due to the wet and warm conditions and that BPA would follow the current Spill Priority List that was linked to the agenda item below. He noted that it was unusual to be spilling this early in the season. He also shared that Grand Coulee would be drafted ‘heavily’ for flood control.

SOR 2011-01

Glenn Vanselow, Pacific Northwest Waterways Association, presented an SOR for MOP+2 operations at Lower Granite starting in April to address safety and economic navigation concerns in the navigation channel and ports in the area. The SOR describing the request and justification had been posted prior to today’s meeting. Glenn suggested this request was being submitted as an interim operation until ports were able to request dredging in the area; dredging had been authorized during settlement negotiations in 2005 but was not moving forward because the development of a COE Sediment Management Plan (which would provide the necessary guidance) had not been completed due to lack of funding. Glenn introduced Brian Fletcher and Craig Nelson of Tidewater Barge Lines who shared additional technical information and answered TMT questions:

- In past years, similar requests have been made for MOP+1 operations. Why the need for MOP+2? Response: Additional encroachment issues and limited depth at the docks, causing safety hazards and property risks, are unique to this year. When we brought this issue to TMT in November, we had suggested MOP+2 would be the request; we were surprised not to see anything in the Fish Operations Plan about this. We found severe sediment turned up at 734.59 feet, indicating the need for a MOP+2 pool.
- With higher flows in the system, is there still a need to provide the additional pool elevation? Response: Regardless of flow, pool elevations are needed for safe maneuverability of the vessels. Mud, sediment and debris are still issues regardless of flow conditions.
- Can you expand on the safety concerns that are noted in the SOR? Response: With no under-keel space below the barges and boats, and with a narrower channel within which to move, maneuverability is challenging and wear and tear occurs on the

equipment. While no vessels have gotten ‘stuck’ yet, sinking, blocking the channel, and risk of breaching are all possibilities – we feel we are at the edge of the safety margin.

- Is the problem in the navigation channel or at the ports? Response: Both.
- Is light loading an option? Response: It would resolve some of the barge issues, but not the boat issues. Also, it would cause economic hardship on an already strained process given the extended lock outage at Lower Granite Dam last year.
- Is the problem alleviated with more use/traffic? Response: To some degree, however the sediment just gets shifted to another part of the channel, so the problem gets pushed to different areas.
- What is the frequency of use/schedule for navigation? Response: It is sporadic and variable, with grain transport happening now until June and log transport starting in mid-May.
- What is the long term remedy? COE Response: Dredging, guided by the Programmatic Sediment Management Plan. A Record of Decision on this is estimated to be completed by December 2012.
- Are there other alternatives? COE Response: The COE could explore options for pursuing an ‘emergency dredging’ option that would allow this action without finalization of the Sediment Management Plan, but that would not likely address the concerns for this year.
- How can the COE implement this request, given the state of the FCRPS litigation and court ordered operations? COE Response: All guiding documents allow for adaptive management changes, particularly if regional consensus is reached on an alternative operation. The COE plans to take the input from today, hear from its internal navigation experts and provide an opportunity for input from RIOG before making a decision.

TMT members acknowledged the safety and economic concerns being raised by the tow boaters and other navigation communities who have been impacted by the narrow and shallow conditions in the Lower Granite navigation channel areas. That said, they also raised concerns for the impacts that the operation being recommended would have on migrating listed fish, and the uncertainties around the court process that is guiding most operations this year.

Next Steps/Action: Steve Barton, COE, said the COE would work internally and with the RIOG to make a decision regarding this request. That decision will be made by the end of this week, prior to next week’s scheduled start of MOP operations.

Update: Steve Barton emailed the proposed operation to TMT and requested feedback via email. TMT visited the issue during a 4/1 call and, with no objections, the following operation was put in to effect (see 4/1 Minutes for more details on the discussion):

Inflows $\geq$ 120 kcfs: Operate for flood control consistent with the Water Control Manual
80 $\leq$ Inflows < 120 kcfs: Operate Lower Granite pool at 734.0-735.0 ft (MOP+1)
50 $\leq$ Inflows < 80 kcfs: Operate Lower Granite pool at 734.5-735.5 ft (MOP+1.5)
Inflows < 50 kcfs: Operate Lower Granite pool at 735.0-736.0 ft (MOP+2)

Dworshak Operations Update

Steve Barton, COE, summarized that Dworshak was currently at elevation 1462.3' and drafting, with 7.5 kcfs inflows and 14.4 kcfs outflows. The project was near 110% TDG. Near term forecasts were used to set the current mid-April flood control target of 1451' and the COE's plan to increase outflows to 18 kcfs later today to achieve 1451' by 4/30. Gunnar Leffler, Walla Walla District COE, added that the COE expects the Flood Control Rule Curve to intersect with the current target in April, and that this will become the new target at that time.

Russ Kiefer, Idaho, noted a concern for exceeding state TDG levels given the potential impacts on entrained kokanee, and asked if the COE might be able to maintain the current outflows, 14.4 kcfs, through the month rather than increase now and have to reduce flows later in the month. This, he suggested, would support reservoir fish populations and migrating listed fish passing the Lower Snake. The COE responded that they are required to meet the rule curve and, sharing Idaho's concern, intend to stay below 115% TDG. Increasing forecasts have posed a challenge to providing smooth operations this year, and, the COE was acknowledged for and said they would continue to do their best to meet multiple needs of the system.

Spill Priority List

Scott English, COE, shared that the posted spill priority list included salmon manager suggested changes and was currently in effect. He noted that the Mid-C projects stayed on as a placeholder for now, and that he was continuing to work with the PUDs to populate that section with useful information.

The salmon managers asked for clarification about the approach used with the list. Steve Barton, COE, said that the approach is to bring the entire system in to the same TDG condition; so starting at the top of the list and moving through all projects to reach 110% TDG; then moving on to 115% TDG (starting with the top project and moving down the list), and so on until the demands of the system are met. During fish passage season, the approach is the same, but for the fact that some projects are already spilling to some degree. The salmon managers asked whether it would be possible to spill to BiOp levels used during the spill passage season prior to the official start of the spill program (4/3 on the Snake and 4/10 on the Columbia), if necessary. The intent would be to spill where the fish were present. Steve Barton responded that this could be considered, however, other considerations such as intent and purpose of the spill priority list (a means of managing involuntary spill while trying to meet state water quality standards) would be important factors in any decision around how to manage involuntary spill.

Action/Next Steps: The salmon managers and COE will continue to check in on the spill priority list, making changes as needed throughout the season. For now, the current list, linked to this agenda item, will be used to guide spill in the system.

Update: The spill priority list was revisited during a 4/1 TMT conference call to discuss an SOR presented by the salmon managers on this topic. See the 4/1 notes for details.

MOP Operations

Steve Barton, COE, said that MOP operations were scheduled to be implemented on 4/3 and were subject to the COE's disposition on SOR 2011-01. Paul Wagner, NOAA, requested on behalf of the salmon managers a staggered start to MOP operations starting with Lower Granite, then Little Goose, then Lower Monumental, etc. as had been requested in previous years.

FOP Process Feedback

Steve Barton, COE, said the typos to the FOP reported by Oregon last week at TMT were acknowledged by legal and policy level representatives, who felt the errors would not impact operations moving forward.

Operations Review

Reservoirs – John Roache, Reclamation, reported on projects: Hungry Horse was at elevation 3500.17' with 8.4 kcfs outflows. Grand Coulee was at elevation 1251.75'; the flood control target for 4/30 would be determined by the early bird and official forecasts out on 3/31 and 4/11. Steve Barton, COE, reported on projects: Libby was at elevation 2364.8', with 9 kcfs outflows and 3.5 kcfs inflows. Albeni Falls was passing inflows and at elevation 2055.5'. Dworshak was at elevation 1462.3', with 14.4 kcfs outflows and 7.5 kcfs inflows, expecting to ramp up outflows to 18 kcfs later today. Day average flows at Lower Granite were 77.9 kcfs; 131.1 kcfs at Priest Rapids; 224.7 kcfs at McNary; and 225.6 kcfs at Bonneville.

Fish – Paul Wagner, NOAA, reported on juveniles. Yearling Chinook counts were 3,100 at Lower Granite (mostly hatchery fish). Subyearling Chinook counts were 1,000/day at Bonneville. Steelhead counts were around 8,000 at Lower Granite –. Sockeye counts at Lower Granite were 2,520 it was noted that these were most likely kokanee. Lamprey counts at Bonneville were about 200, and around 50 at Lower Granite.

Dave Wills reminded TMT that the Fish Passage Center produces a weekly report on hatchery releases, showing actuals and forecasted. He also reported that the Dworshak hatchery fish release was nearly complete, and that repairs on a water pipe at the hatchery would begin on Monday. Finally, he noted that coordination around the Spring Creek hatchery release and Bonneville turbine operations was underway, and that he would submit and present the plan for finalization at the 4/6 TMT meeting. Operations will begin on 4/12.

Power system – Tony Norris, BPA, reiterated that lack of market spill was underway, and that BPA was using the spill priority list to guide its actions. Grand Coulee will be drafted through April.

Water quality – Laura Hamilton, COE, reported that all fixed monitoring stations were on line in time for start of the spring spill season.

Next Meeting, April 6, 9:00 am

Agenda items include:

- Vernita Bar Operations
- Water Supply Forecasts
- Dworshak Operations Update
- Grand Coulee Operations
- Spring Creek Hatchery Release
- Chum Emergence
- Operations Review
- MOP Operations
- Snake River Spill

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

March 30, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of BPA, COE, NOAA, CRITFC/Umatilla, USFWS, BOR, Oregon, Idaho and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Current Operations

Tony Norris, BPA, notified TMT that, due to lack of market spill combined with flood control drafting requirements at Grand Coulee, BPA would most likely be spilling within the hour. Project operators will follow the current spill priority list on the agenda for discussion later today.

3. SOR 2011-01, Lower Granite Pool Held at MOP+2 Feet through August

Glenn Vanselow, Pacific Northwest Waterways Association, presented SOR 2011-01. Brian Fletcher, Tidewater Barge Lines, and Craig Nelson, Tidewater Barge Lines, addressed technical issues regarding the operation of tugs. Representatives of the ports of Clarkston and Lewiston were also on the line. SOR 2011-01 requests that Minimum Operating Pool (MOP) at Lower Granite pool be modified to provide safe conditions for navigation. This change would take the Lower Granite pool from its typical MOP elevation range of 733-734 feet to the 735-736 foot range.

The reason for requesting the added depth is navigation problems in the confluence of the Clearwater and Snake Rivers, caused by the presence of sediment in the main river channel which was last dredged in December 2005 and early 2006. Dredging has not occurred since then due to outstanding legal issues associated with an ongoing lawsuit associated with dredging in the Snake River. Part of the Settlement Agreement stipulated the need to have a finalized Sediment Management Plan completed prior to dredging the Snake River as specified in the Settlement Agreement. The Sediment Management plan was due in 2009 but due to lack of funding the Sediment Management Plan has not been completed. The record of decision for the Programmatic Sediment Management Plan is scheduled to be signed in December of 2012.

In previous years TMT agreed to a MOP+1 operation, Vanselow recalled, and on November 10, 2010, navigators presented a request to operate at MOP+2 although the meeting notes say MOP+1. This variation is in accordance

with RPA 5 of the BiOp, which calls for MOP operations but allows for adjustments for authorized purposes, primarily navigation. Encroachment of sediment in the federal navigation channel has reduced navigation depths at port facilities and in Clarkston, which creates a safety hazard for cargo barges and cruise boats. When Lower Granite forebay elevation was at 734.59 feet on March 28, boat propellers were turning up severe sediment during maneuvering. This type of problem exists from the port of Lewiston down through the confluence of the Clearwater. Paul Wagner, NOAA, asked whether the main navigation channel or port access is the problem. The biggest hazard is in the main navigation channel, Fletcher replied.

Barton asked whether these conditions are normally seen when flows are low, or is there a flow threshold that provides natural relief? A Port of Lewiston representative said the sediment created navigation problems for the port all last summer, but couldn't tie it to specific flow volumes. Low elevations combined with higher river flows worsen the situation and can have serious consequences. Barton asked about the nature of the safety concerns. Lack of keel clearance for barges limits maneuverability and makes them harder to control, Vanselow explained. There's wear and tear on the equipment.. Last year the situation skirted the edges of safety. There are also economic impacts when barge passage is limited by sediment, Fletcher added.

Wagner asked whether lighter loading of barges could help solve the problem. To what extent does frequent use help solve it? The sediment never really goes away, Fletcher replied, although regular movement helps keep it in check. Tidewater barges travel the channel continuously at least twice a week year-round, Nelson said. Barton asked whether the frequency of use is different this year than in other years. Usually it slows down in June and picks up again in late July, Vanselow replied. This year is unusual in that a lot of cargo has been moved early because of a planned lock outage. Wanda Keefer, Port of Clarkston, said an estimated 2-3 barges of logs go out of the port per week, plus cruise boat traffic every other week.

Ron Boyce, **Oregon**, said he needs more time to sort this issue out before responding. The MOP+2 proposal needs to be formally vetted through the regional process. We need to clearly understand the impacts of such an operation on fish and know what the alternatives are, including ways to mitigate impacts on fish.

Russ Kiefer, **Idaho**, said it's important to figure out how to accommodate both the needs of fish and river commerce in Idaho. Wagner reported that **FPAC** discussed this issue yesterday and noted there are allowable deviations from the BiOp-ordered MOP operation at Lower Granite. He asked why dredging hasn't happened. The court Settlement Agreement allows for dredging, Vanselow said, but the ports and the COE have been waiting for the Sediment Management Plan. The question at hand is, are there alternatives to dredging that will keep

sediment out of the river? The Settlement Agreement allows for dredging, however the ports and the COE have been waiting for the outcome of the Sediment Management Plan because there could be a potential challenge from former plaintiffs in the Settlement Agreement.

Tom Lorz, **CRITFC/Umatilla**, asked what the COE's long term plans are to address the sedimentation issue. We've been working on the long term Sediment Management Plan, which was scheduled for completion in 2009, but funding cuts have made it difficult to proceed, Steve Hall, COE Walla Walla, reported. Lorz wondered whether the criteria for allowing emergency dredging could expedite the dredging before 2013. There is an emergency dredging stipulation in the Settlement Agreement, Ann Glassley, COE, replied.

In response to the SOR, Barton said, the **COE** will look into its emergency authority to dredge as one potential solution, and will take a comprehensive look at solutions. Barton will communicate TMT's feedback within the COE, as well as to RIOG members and federal executives. The timing of water management decisions is critical at this point, given that MOP operations start on April 3 which is fast approaching. Barton will communicate the COE's decision regarding the SOR to TMT and to Vanselow for distribution to other navigators.

4. Dworshak Operations Update

Dworshak is at 1,562.3 feet, continuing to draft toward elevation 1,451.4 feet by mid-April, Barton reported. Inflows have been in the range of 7.5 kcfs and discharges are 14.4 kcfs. The near-term forecast shows we're on track to reach the mid-April target, but the model is suggesting that the COE increase discharges by around 2 kcfs, as noted last week.

Gunnar Leffler, COE Walla Walla, reported that outflows will increase to 18 kcfs at midnight tonight. This is due to a projection that the system flood control requirements at Dworshak will intersect with the flood control refill curve before April 30 – especially with the surge of water that's expected starting April 1. Tony Norris, BPA, said Snake River elevations have been high for a while, and BPA has had a request to increase discharges from Dworshak.

Lorz reminded everyone that flow volume influences whether the Little Goose spillway weir should be in the high-crest or the low-crest position. Kiefer said he was notified the COE plans to operate Little Goose in the low-crest mode based on the latest STP forecast.

Kiefer expressed concern that increasing outflows to 18 kcfs will exceed the state water quality standard, entrain more kokanee at Dworshak, and reduce the likelihood of meeting flow objectives later in spill season. He wondered whether it would be possible to maintain the current 14.4 kcfs operation through April because it would be better for the reservoir, water quality, and fish passage

in the lower Snake below Dworshak. Leffler explained that 14.4 kcfs kept TDG levels right at 110% for hatchery releases, but the COE is ultimately required to operate to the system flood control refill curve. The goal for project operators is to release 18 kcfs but keep TDG levels under 115%. Because the water supply forecast is increasing system wide, with adverse weather moving through the basin, flood control at this point is a challenge, Barton said.

Karl Kanbergs, COE, pointed out that while the latest STP traces show Dworshak inflows going up to around 20 kcfs around April 1, it looks like the forecast has increased since then. It's not inconceivable that Dworshak will go into local flood control operation if inflows rise as high as forecasted on the north fork of the Clearwater. Kanbergs said the COE will consider Idaho's request for a smooth operation as projects are positioned to provide flows when needed to meet flow objectives. TMT will follow up on this issue at its next meeting April 6.

5. Spill Priority List

Scott English, COE, reported that the COE made a few changes to the spill priority list since it was presented to TMT last week. Changes to the current list, linked to this item on today's agenda, include the Little Goose day and night priorities, the order of projects as discussed previously at TMT, and placement of the lower Columbia projects in response to feedback from FPAC. English reminded everyone that the mid-Columbia projects are listed for information only and the COE has no authority to spill there. Barton said this list was distributed yesterday and will be implemented without further notice unless TMT recommends a change.

The order differs slightly this year from past years due to FPAC input. Yesterday's FPAC discussion got confusing with regard to implementing the list when projects are spilling in the 110-115% range, Wagner said. FPAC preferred to exhaust spill amounts going down the list, rather than stay in the 110% TDG range at each project. To address the confusion, Barton walked everyone through the process of how the list will be activated to minimize impacts of involuntary spill due to lack of load. Beginning with the 110% column, the projects would spill in order, continuing down the list until either the problem is alleviated or the list ends. If that's not enough spill, the COE will work its way down the 115% TDG column and subsequently higher levels. Barton said the Grand Coulee (a) and (b) distinction involves forebay elevations and whether the drum gate or regulating outlet is used. The distinction between day and night spill at Little Goose was added in response to FPAC recommendations.

Norris said there haven't been any problems with lack of market spill for congestion affecting the order of the list. That's usually the result of summer minimum generation rather than a lack of market spill in spring. Kiefer asked, would Dworshak spill 37% before the COE moves to the 115% line to look for relief? Barton said yes.

The distinction between bulk and flat spill at Lower Monumental is the result of FPAC research indicating that a bulk spill pattern is better for survival, Kiefer said. Bulk spill is therefore FPAC's preferred pattern at Lower Monumental, but switching to flat spill could provide some relief in high TDG situations. He recommended adding this distinction to the spill priority list. The COE recognizes that as an FPAC recommendation, Barton said. Although it's not reflected on the current list, it's still under discussion.

Wagner asked, instead of spilling 20 kcfs at Little Goose and Lower Granite, why not go straight to BiOp spill levels before spill season starts? That would provide benefits to juveniles first, rather than going through the 110%, 115% and 120% TDG levels at all projects on the list before finally hitting BiOp spill at 120% for key projects. This is why there has been consternation regarding the relative order of projects. One issue is a lack of state waivers to cover all these conditions, Barton replied. The waivers take effect on April 3 in Oregon and on April 10 in Washington. While the waivers cover spill operations for fish passage, the spill priority list is tied to over generation, not fish passage. The BiOp spill suggestion could be discussed but it goes counter to what's been in the spill priority list, Barton said. The COE will consider the purpose of the suggestion and how it fits into other operations. Other TMT members gave their views of the FPAC proposal to implement the spill list at varying TDG levels:

- **CRITFC/Umatilla** – it makes sense to put any extra spill where fish are instead of at Dworshak. This is potentially a wiser operation.
- **Oregon** – No comments.
- **Idaho** – It seems logical to put spill near the start of migration on projects where more listed fish are migrating.
- **Washington** – Concurs with Idaho.
- **USFWS** – No comments.
- **BPA** – Would have a problem with this change unless the states issue waivers with new dates. Currently there's no coverage for spill over 110% TDG outside of fish passage season. It might be possible to implement this idea by altering the % TDG column designations without having to invoke the state waiver process.
- **BOR** – No comments.

There's a time of travel equilibrium associated with TDG values in the spill priority list, Scott English added. TMT will revisit this issue.

6. MOP Operations

Subject to disposition of SOR-2011-01 at Lower Granite, all federal projects will be at MOP as required on April 3, Barton reported. The Salmon Managers would like to request the same relative order as in prior years, (Lower Granite, Little Goose, Lower Monumental, and Ice Harbor), Wagner said. The Action Agencies were not in a position to respond to this request today.

7. FOP Process Feedback

Steve Barton, COE, gave an update since the last TMT meeting, when Rick Kruger, Oregon, pointed out errors in a header and a portion of text regarding Lower Granite that should have been deleted. The FOP has been incorporated into the court order with the errors noted by Oregon, and the COE will operate to that order. The errors won't affect overall operations.

8. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3,500.17 feet, discharging 8.4 kcfs. Grand Coulee is at elevation 1,251.75 for drum gate maintenance, operating to spring flood control targets. As mentioned earlier, an increase in water supply to The Dalles is expected in mid April. The BOR will use the early bird RFC forecast to estimate the April 30 elevation and plan April operations accordingly. The official forecast for April is due around April 11.

Libby is at elevation 2,364.8 feet, discharging 9 kcfs with inflows around 3.5 kcfs, operating to the end of March flood control target. Wagner asked whether a larger inflow forecast would cause additional drafting at the end of April. The forecast is around 6.9-7.1 kcfs and fairly stable, Kanbergs said.

Dworshak is at elevation 1,462.3 feet, discharging 14.4 kcfs as discussed earlier, with inflows of 7.5 kcfs. Discharges are expected to increase to 18 kcfs in response to an approaching storm.

Lower Granite is discharging 77.9 kcfs, Priest Rapids is discharging 131.1 kcfs, McNary is discharging 224.7 kcfs, and Bonneville is discharging 225.6 kcfs. Yesterday's STP was in excess of 150 kcfs on the lower Columbia.

b. Fish. Juveniles: Paul Wagner, NOAA, reported that yearling Chinook are passing the January trap at the rate of a couple hundred per day, 20 per day at Grande Ronde, and 3,100 per day at Lower Granite. This is a mixture of hatchery and wild fish. Less than 1,000 fish per day are passing Bonneville. These are hatchery releases from tributaries above the Bonneville pool. Subyearlings (mostly fry) are passing Bonneville at the rate of 1,000 per day. Steelhead passage bumped at 8,000 per day at Lower Granite. A Dworshak

hatchery release could have been a big contributor to that total. Russ Kiefer confirmed that a lot of those 8,000 steelhead were from hatchery releases.

Adults: Wagner didn't have much to report. Next week might bring more adult movement.

c. Power System. As mentioned earlier, BPA is probably spilling now due to lack of market load, Norris said. Grand Coulee will be drafting heavily in April in response to robust flows on the mid Columbia.

d. Water Quality. Laura Hamilton, COE, reported that as of yesterday all fixed monitoring stations were installed and ready for spill season.

9. Other

Dave Wills, USFWS, made three announcements:

The Fish Passage Center publishes a weekly report through the Friday of each week. Last Friday's report documents hatchery releases for the previous weeks, as well as those planned for coming weeks. This is a useful tool for figuring out how many fish are coming down the river.

The Dworshak hatchery release is nearly complete, and the Chinook release was completed last week. Tomorrow the steelhead release will be completed early this year so repairs to the hatchery pipe can proceed.

As documented in the Water Management Plan, TMT needs to coordinate Bonneville turbine operations for the Spring Creek release on April 12. Wills is reviewing last year's teletype for this operation and will submit it for TMT discussion next week.

10. Next Meetings

The next regular TMT meeting will be on April 6, with the Spring Creek Hatchery release, , Dworshak operations, MOP operations, spill operations, and the disposition of SOR 2011-01 on the agenda. TMT will meet weekly thereafter.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Tony Norris	BPA
Doug Baus	COE
Brian Fletcher	Tidewater Barge Lines
Glenn Vanselow	Pacific Northwest Waterways Association
Craig Nelson	Tidewater Barge Lines
Paul Wagner	NOAA
Tom Lorz	CRITFC/Umatilla

David Wills	USFWS
John Roache	BOR
Karl Kanbergs	COE
Steve Hall	COE
Ann Glassley	COE
Cathy Rogers	COE
Eric Braun	COE
Scott English	COE
Wanda Keefer	Port of Clarkston
Amy Benner	Port of Lewiston
Alex Ibarra	Grant PUD
Greg Hoffman	COE
Charles Morrill	Washington
Margaret Filardo	FPC
Barry Espenson	CBB
Dave Benner	FPC
Russ George	WMC
Bruce McKay	Consultant
Ruth Burris	PGE
Mike Shapley	Snohomish PUD
Rob Allermann	Deutsch Bank
Tara Kelly	JP Morgan
XX	Benson Energy
Shane Scott	PPC
Tom Le	Puget Sound Energy
Glen Trager	Iberdrola
Doug Matoon	Valley Vision
Richelle Beck	DRA
Tim Heizenrader	Centaurus
Ron Boyce	Oregon
Gunnar Leffler	Walla Walla
Russ Kiefer	Idaho

SYSTEM OPERATIONAL REQUEST: #2011-01

The following Navigation Interests have participated in the preparation and support this
SOR: Columbia River Towboat Association,

TO:

Brigadier General John McMahon	COE-NWD
James D. Barton	COE-Water Management
Cathy Hlebechuk	COE-RCC
Witt Anderson	COE-PDD
LTC David Caldwell	COE-Walla Walla District
J. William McDonald	USBR-Boise Regional Director
Stephen J. Wright	BPA-Administrator
Steve Oliver	BPA-PG

FROM: John Pigott, Columbia River Towboat Association, Wanda Keefer, Port of Clarkston; David Doeringsfeld, Port of Lewiston; Arvid Lyons, Lewis and Clark Terminal; Doug Matoon, Valley Vision, Inc.

DATE: March 23, 2011

SUBJECT: Lower Granite Pool held at MOP plus 2 feet April through August

Navigation Objectives

The objective of this SOR is to provide for safe navigation and marine facility access in the Lower Granite pool during the fish migration season.

Specifications

This SOR requests that the seasonal special operation of the Lower Granite pool at Minimum Operating Pool (MOP), to accommodate out-migrating salmonids, be modified to allow for two feet of water above MOP for the period of time when MOP operations are normally in place. Typically, this is from April through August.

Justification

We find ourselves once again, in the absence of dredging since 2006, facing a problematic set of challenges triggered by mandated MOP operations in the Lower Granite pool and shoaling in the federal navigation channel. This has created an unacceptably high safety risk for river system navigators. In past years we have requested an additional foot above MOP in the Granite pool. We now are asking for an additional foot of water (MOP+2) to offset the increase in shoaling. We would much rather have the system dredged and avoid these requests but that seems unlikely to occur as federal funding for dredging is scarce and environmental challenges will be as determined as ever. All this being said the customers of the Columbia-Snake River System have now returned to work, after a month's long system maintenance closure, moving the goods and commodities that provide family sustaining jobs while creating wealth in our state, regional and national economies. It is critical for all waterway stakeholders that this

system, especially as it works to recover from a prolonged shut down, to have a system that can support safe and efficient freight mobility.

Presently the approaches to the Ports of Lewiston and Clarkston have shoaling issues that reduce safe transit options and cause groundings and delays. Boats working in these areas are pushing mud, experiencing unexpected sheers (course diversions) from bank and bottom encroachment and generally have fewer places to run when traffic, especially recreational vessel traffic is heavy. The channel from the confluence of the Snake and Clearwater Rivers is problematic as shoaling is shifting and therefore hard to avoid. The area close to the Camas Prairie Railroad Bridge has lost about a quarter of its designated width. The area off the Lewis and Clark Terminal in Lewiston has also shoaled to a point where maneuvering tows is so restricted that you can no longer turn a barge in that area. Even the water along the dolphin line at the terminal is shoaling causing barge groundings while loading. The Port of Clarkston is similarly afflicted with shallow water that now threatens to foreclose cruise ship, operations at that port.

With today's siltation in the Granite pool grounding is an ever present threat once the pool drops to MOP. These groundings while in transit create an unacceptable safety risk for deck crews exposed to unexpected rigging failures and falls overboard. The possibility of holing a boat or barge hull is also an ever present danger along with the possibility of a pollution event. The challenges continue at some loading facilities where grounded barges create a pivot for strong currents to break them away. For other facilities, such as the Port of Clarkston, the larger cruise vessels simply cannot reach their facility. All of these threats are magnified when adverse weather is brought into the equation. Restricted visibility and high gusty winds can increase the difficulty of keeping to the channel when needed room to maneuver simply isn't there.

The economic loss resulting from all these events is significant as boat crews spend more time doing less work as maneuvering in mud and dealing with groundings consumes more of their time. Grain facilities in Lewiston are forced to load more slowly and coordinate with fluctuations in pool levels to complete a barge. This adds time and labor costs. The Port of Clarkston and the city of Clarkston are denied the economic activity that the port and city typically would benefit from when cruise ship business cannot be accommodated due to insufficient water depths.

In consideration of all the above, the supporters of this SOR respectfully request an change in operations to allow the Lower Granite pool to be held at MOP +2 from the beginning of April through the end of August.

Respectfully,

John Pigott
Chairman
Columbia River Towboat Association

PRO-----TDG%-TDG%-TDG%--TDG%-TDG%--TDG%
JECT-----110--115--120---125--130---135

LWG-----20---30----41----90--125---200--
LGS(Night)10---15---32----80--150---250--
MCN-----40---80---145---230--290---450--
LMN-----10---15----26----95--180---250--
IHR-----30---45----95---125--180---240--
LGS(Day)--10---15---32----80--150---250--
MID C-----??---??----??----??---??----??--
TDA-----20---60---125---250--360---600--
JDA-----20---60---120---240--450---600--
BON-----50---65---100---150--225---270--
CHJ-----20---50---100---130--165---200--
GCL(a)----0---5----10---20---35----50--
GCL(b)----0---15---30---75--120---130--
DWR-----37%--42%---50%---60%--70%-----

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Friday April 1, 2011 1:00pm - 3:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. SOR 2011-01 Spill Priority List
 - a. [SOR 2011-01 Spill Priority List](#)
 - b. [COE Proposed Spill Priority List](#)
3. SOR 2011-01 Lower Granite Pool Held at MOP Plus 2 Feet April Through August - Steve Barton - COE-NWD
 - a. [2009 Photo](#)
 - b. [2010 Confluence Survey](#)
4. Other
 - a. next meeting - **April 6, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 1, 2011
Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

SOR 2011-01 (Spill Priority List)

The salmon managers, led by Paul Wagner, NOAA, presented a recommended spill priority list as a follow up from the discussions had at TMT on 3/30 and in light of the higher flows in the system requiring over generation spill. The salmon managers coordinated with state water quality agencies on the proposal to ensure the list would comply with water quality waiver constraints if implemented. All TMT members, including Montana who deferred to the FPAC participants on this issue, supported the proposal.

Steve Barton, COE, shared a ‘COE Proposed Spill Priority List’ that he said reflected the request. He asked for a few clarifications on the request for the period April 1-2 (prior to beginning of the court-ordered spill program). The salmon managers clarified the intent was to operate to the TDG percentages rather than specific spill amounts that were coupled with the percentages in the SOR; that Little Goose should spill first daytime to 30% of total river flow, then nighttime to 30% total river flow, then nighttime to 120% TDG; and that the intent with the projects from Chief Joseph to Dworshak was to spill to specific percentages at these projects after all other projects had reached 120%; then after all projects on the entire list reached 120%, spill to 125%, 130%, etc starting at the top of the list and moving down in the order listed in the SOR.

With regards to post-April 3 operations, the SOR recommended the COE’s process of moving through each project at 115%, then 120%, etc. using the project order listed in the SOR. TMT engaged in more discussion around this issue, and all agreed that it will need to be revisited as the season progresses.

Planned Operation: For April 1 and 2, Steve Barton, COE, proposed to use the spill priority list as described in the COE document linked to today’s agenda, with the caveat that Little Goose priorities would be reflected as they are described above.

Consensus: TMT members supported and/or did not object to the COE’s proposal. Members present on the call included representatives from Oregon, Idaho, Washington, Montana, Confederated Tribes of the Umatilla Indian Reservation (CTUIR), USFWS,

NOAA, BPA and the COE. With consensus, the COE agreed to provide the spill priority guidance to the projects.

With regards to April 3 and beyond, TMT discussed the need to provide the most biologically sound spill priority while the fish are moving through the system and to stay in line with the court ordered spill program. As such, the COE planned to use the spill priority list and process as described in the 3/30 version of the list that was discussed at TMT that day. TMT members were polled on this plan, and many expressed a caveat that the list needs to be revisited throughout the spill season to understand how it is being used and whether changes should be made to it given changing conditions:

- Oregon – No objection
- Washington – No objection
- Idaho – No objection
- Montana – No objection
- NOAA – No objection
- USFWS – No objection
- CTUIR – No objection
- BPA – No objection – sufficient guidance for the short term

SOR 2011-01 (MOP+2 Operations at Lower Granite for Navigation Purposes)

Steve Barton, COE, reported that, since the 3/30 TMT meeting, the COE had done an internal investigation and had additional information to share with TMT that supported the COE's proposed operation in response to SOR 2011-01 requesting MOP+2 operations at Lower Granite for safe navigation in the Lewiston area. (Steve had emailed the proposed operation to TMT on 3/31 and asked for input from all TMT members.)

Today he showed a photo of the areas identified as providing less than 14 feet of depth, a depth that had been deemed through Congressional authorization to be safe for navigation through the federal channel and port areas. Steve confirmed that the area in question was part of the federal navigation channel; that some areas were much shallower than 14 feet; and that flow was a factor in determining depth provided at Lewiston. Given all this, the COE proposed a tiered approach to addressing the navigation issues, while minimizing the extent to which the project would need to operate outside MOP. The following operating ranges for Lower Granite for April- August were proposed by the COE:

Inflows $\geq$ 120 kcfs: Operate for flood control consistent with the Water Control Manual
80 $\leq$ Inflows < 120 kcfs: Operate Lower Granite pool at 734.0-735.0 ft (MOP+1)
50 $\leq$ Inflows < 80 kcfs: Operate Lower Granite pool at 734.5-735.5 ft (MOP+1.5)
Inflows < 50 kcfs: Operate Lower Granite pool at 735.0-736.0 ft (MOP+2)

TMT members discussed the proposal. They acknowledged and supported the COE's responsibility to provide safe navigation conditions and agreed that this is unusual in that it is a season-long change to planned operations and has implications for fish operations (that might be negatively impacted). Suggestions were made that:

- The COE needs to show its commitment to finding a long term solution before the next spill season.
- At the 4/6 meeting, TMT should consider adjustments to other planned operations to determine reasonable actions that could be implemented for this year.
- The navigation issues should be reassessed at some point this season (June? July?) so that adaptive management changes can be made as appropriate.
- Is there a need to revise the FOP to include this operation and resubmit a revised FOP to the court?

Given the information and bulleted comments above, TMT members were then polled regarding their support for the COE's proposed plan to address the concerns raised in SOR 2011-01:

- Idaho – No objection as a necessary action for safety (and desire to consider alternatives fish migration operations)
- Washington – No objection
- Oregon – No objection (pending alternative fish migration operations)
- Montana – No objection
- USFWS – No objection, and feel mitigation measures should be addressed
- NOAA – No objection, consistent with the BiOp – a balanced alternative; will discuss alternatives
- CTUIR – No objection; without an emergency being declared, there is a concern that movement on the longer term solution will get delayed. Also want to consider alternative fish operations.
- BPA – Defer to the COE on navigation safety matters.
- *Steve Barton reported that the Nez Perce Tribe did not object to the proposed operation per off-line coordination prior to this TMT call.

Action/Planned Operation: The COE planned to move forward with implementation of the proposed operation as a short term measure to address the navigation safety concerns raised in the SOR. While they cited some challenges that would not allow them to implement any changes this year, the COE will continue actively pursuing options for addressing the issue for the long term, including reviewing the criteria for declaring an 'emergency' that might allow for dredging to begin prior to the finalization of the Sediment Management Plan. TMT will revisit this issue at the next, 4/6, TMT meeting, and throughout the spring and summer season as deemed appropriate.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 1, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton and Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of BPA, COE, NOAA, CRITFC/Umatilla, USFWS, Idaho, Washington, Oregon, FPC, Montana and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. SOR 2011-01, Spill Priority List

The COE will rename one of the SORs submitted today, as both have the same number (see agenda item 3 below). Barton asked the Salmon Managers for feedback on whether the COE spill priority list accurately reflects their priorities for April 1 and 2. TMT also began discussion today of spill operations April 3 and beyond.

Spill until April 3: Paul Wagner, NOAA, provided a follow-up to the March 30 TMT conversation regarding the use of over-generation spill for early migrants, including waiver constraints if spill begins early. Dave Wills, USFWS, added that there's no specific timeline in the Washington exemption as to when fish passage aid could be given, which appears to be an endorsement for spilling early.

Barton asked clarifying questions about the order and amounts of spill in the SOR, including pauses during nighttime hours. Wagner explained the intent is to go to 120% TDG nighttime spill at the projects before moving to the next project on the list. Barton asked the intent of listing Chief Joseph and Dworshak in the order given. When one project goes to 120% TDG, that's when the next project on the list should start spilling, moving incrementally through the projects as listed at 125%, 130% and 135% TDG, Wagner replied.

Barton asked whether the SOR proposes to follow the spill priority list presented on March 30 at 125% TDG. For this interim period, Wagner replied, the proposal keeps the same order that starts April 3, or whenever spring spill starts according to the FOP. Wills added that not all projects have BiOp spill levels at the complete gas cap.

Barton showed TMT the COE's proposed spill priority list (agenda item 2b), noting that the Little Goose day and night listings will be adjusted to reflect SOR 2011-01 specifications. The COE list mirrors that list, with the exception that

Dworshak is omitted from spill at levels above 110% TDG. Barton said the COE will reach out to other sovereigns not present on today's call to vet this list with them. Barton confirmed the intention is to spill in this order: Lower Granite, Little Goose 30% daytime, Little Goose 30% nighttime, Little Goose nighttime gas cap, Lower Monumental, then Ice Harbor. In response to today's conversation the COE will adjust accordingly..

TMT members present on today's call gave their views of the COE proposal to cover spill operations until April 3 when the FOP goes into effect:

- **Montana** – No objections.
- **NOAA** – Supports it.
- **CRITFC/Umatilla** – Supports it.
- **USFWS** – Supports it.
- **Washington** – Supports it.
- **Idaho** – Supports it.
- **BPA** – Defers to the COE regarding changes to the spill priority list.
- **Oregon** – No objection

Hearing no objection and pending confirmation with other sovereigns, the COE will implement the spill priority list as discussed today, including the Little Goose correction.

April 3 and beyond: Page 2 of the proposed spill list shows the COE counterproposal to the Salmon Managers proposal for voluntary spill April 3 and beyond. Wagner confirmed their preference for spill at Lower Granite, Little Goose and Lower Monumental in that order, according to the current spill priority list, rather than raising the Lower Columbia and Snake River projects to 120% TDG first. It doesn't make sense to the COE not to spill to 110% and 115% TDG at Chief Joseph and Grand Coulee before deviating from court-ordered spill at the lower Columbia and lower Snake projects, Barton said.

Margaret Filardo, FPC, asked whether the COE would spill to 110% and 115% in the lower river, even though the FOP doesn't require spill at the lower river projects, before spilling to 120% in the Snake. Voluntary spill puts us at between 110-120% TDG, and it doesn't make sense not to use the spill capability at Chief Joseph before intentionally deviating from the court ordered spill, Barton replied. It might be wise to consider spilling at downstream projects that are below 120% TDG before spilling at Grand Coulee and Chief Joseph, Tom Lorz, CRITFC/Umatilla, said.

TMT members gave their views of the COE's plan for managing voluntary spill for April 3 and beyond:

- **Idaho** – No objection to implementing the program as originally planned.
- **Montana** – No objection.

- **Washington** – No objection.
- **CRITFC/Umatilla** – This is probably acceptable. Will call the COE Monday morning, April 4, if there's a problem.

The COE will follow the court order starting April 3 to provide spill for fish passage and over-generation at projects not spilling first, in order to not interfere and intentionally deviate from court-ordered spill on the lower Snake, Barton said. It's important to manage over-generation conditions at projects first that won't interfere with spill operations as specified in the court order.

In an over-generation condition, with involuntary spill on the Snake and McNary spilling past fully loaded turbines on April 3, the COE would keep moving down the list until the over-generation problem is alleviated. The goal is to increase spill while maintaining a maximum level of consistency with the court order. Implementing the court order means it's not right to spill first without using other over-generation management tools.

TMT members then expressed their views of the COE plan, as described in the March 30 TMT meeting, for managing involuntary spill from April 3 until TMT meets again April 6, including compliance with court-ordered spill:

- **NOAA** – No objection.
- **USFWS** – No objection.
- **Oregon** – Supports this.
- **Washington** – No objection.
- **Montana** – No objection.
- **CRITFC/Umatilla** – No objection until Monday, with TMT call if needed.

TMT will discuss the spill program further at its next meeting April 6. In the meantime, hearing no objections, the COE will operate according to the SOR-corrected list. Beginning April 3 the COE will spill in accordance with the spill operation identified in the FOP.

3. SOR 2011-01, Lower Granite Pool at MOP+2 April through August

The COE will rename this SOR so it doesn't have the same number as the spill-priority SOR discussed above. The first link to this item on today's agenda is a 2009 satellite image of a GIS overlay that identifies areas in the federal navigation channel with less the 14 feet clearance, the minimum for safe navigation, Barton said. On the east side there's a shallow area in front of Lewiston, and another in front of Clarkston where shoaling encroaches on the federal navigation channel. Areas in red are less than 14 feet deep when the surface elevation is 733 feet. Channel survey data indicates that, in order to provide 14 feet of depth, the minimum elevation at Lewiston would be 735 feet, or MOP+2 range, Barton said. Similar conditions exist in the area in front of Clarkston. Thus the SOR is consistent with data in COE internal surveys that

indicate a 735-foot (MOP+2) minimum elevation at Lewiston is adequate to provide 14 feet of minimum navigation depth throughout the federal channel.

The next step was to determine how Lower Granite needs to operate to meet the constraint at Lewiston, Barton explained. Certain flows produce a backwater effect at 120 kcfs or greater. The maximum flood control elevation at Lower Granite is 734 feet to protect against the backwater effect flooding Lewiston.

The proposal the COE submitted yesterday morning is a more staggered approach than the blanket MOP+2. It attempts to factor in the backwater effect that is naturally present in the Snake River between Lower Granite and Lewiston with what's actually required at Lower Granite in order to provide a minimum safe depth in Lewiston. Barton broke it down as follows:

- For flows equal to or greater than 120 kcfs, Lower Granite will be operated to flood control guidance as specified in the Water Control Manual (MOP 733.0 - 734.0 feet).
- For flows between 80-120 kcfs, MOP +1 (734.0 - 735.0 feet) appears to be an adequate minimum navigational depth at Lewiston.
- Flows between 80-50 kcfs require MOP +1.5 (734.5 – 735.5 feet).
- For inflows of less than 50 kcfs, operate at MOP+2 (735.0 – 736.0 feet).

This minimizes the extent and duration outside prescribed MOP operations, Barton said – it's a balanced approach between obligations to the federal channel while also trying to implement as best as possible the MOP operations in Lower Granite pool. Wagner pointed out that the requirement calls for Lower Granite to be no higher than 734 feet elevation when flows are above 120 kcfs, and if flows are about 136 kcfs, the plan is to be in the 734-foot elevation range. The objective is to maintain the federal channel to provide navigation service, as authorized in the BiOp. The SOR is consistent with the minimum depth needed to provide safe navigation as specified in RPA-5.

USFWS is concerned about fish protection measures at MOP+2, Wills said. The BiOp didn't anticipate a season-long, required deviation from MOP operations. Dredging needs to be done quickly to address this problem sometime before 2014, when the sediment management plan would have been completed if it were funded as planned. Barton said the COE is actively pursuing options to address this need. Steve Hall, COE, explained that it wouldn't be possible to arrange for dredging this year even if funds were available. TMT members expressed their views of the SOR:

- **Idaho** – For safety and navigation interests, no objections to the proposed operation. Recommends that TMT consider adjustments to the planned operation to see whether regional actions could result in similar fish protection levels in a flow year like this. Asked that TMT consider at its

next meeting whether a reasonable adjustment to the planned operation would provide similar fish protection measures without going outside of MOP.

- **USFWS** – Supports Idaho’s observations. No objections under the circumstances, but the dredging issue needs to be addressed before fish passage season next year. The FOP should be revised and resubmitted to the court because it doesn’t reflect actual operations this season.
- **Washington** – Agreed with USFWS and asked what the process is to submit an amendment to the FOP. No objection to the proposed operation; supports the COE’s staggered approach.
- **NOAA** – This plan is consistent with the BiOp. Thanked the COE for coming up with a staggered approach not just MOP+2. Let’s verify whether there’s still a problem in July, as higher flows can produce either more sediment or movement of sediment. The real impact of this SOR will occur in the July/August period.
- **Oregon** – No objections today, but wants to discuss a better operation next week at TMT.
- **Montana** – No objections to the proposed operation. Not sure a formal change in the court filing is needed.
- **CRITFC/Umatilla** – This is an interesting dilemma because if we do nothing, it will result in a state of emergency, which could authorize emergency dredging. No objection because the operation is needed to avert an emergency. However, MOP+2 will have a significant impact, and we need to talk about how to mitigate those changes from what was envisioned in the BiOp.
- **BPA** – Defers to the COE regarding navigation safety matters.

Hearing no objections to the proposed operation, the COE will proceed with the proposed MOP+2 operation while addressing the need for a long-term solution, Doug Baus, COE, said. TMT will follow up on this on April 6, including any interim steps and planning needed for adaptive management.

4. Next Meeting

The next regular TMT meeting will be April 6, with the Spring Creek Hatchery release, Bonneville turbine operations, Dworshak operations, spill priorities, and the disposition of SOR 2011-01, MOP+2 operations, on the agenda.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Tony Norris	BPA
Doug Baus	COE
Paul Wagner	NOAA
Tom Lorz	CRITFC/Umatilla

Rick Kruger	Oregon
Charles Morrill	Washington
Jim Litchfield	Montana
David Wills	USFWS
Russ Kiefer	Idaho
Margaret Filardo	FPC
Dave Benner	FPC
Brandon Chockley	FPC
Kim Johnson	COE
Steve Hall	COE

PROPOSED SPILL PRIORITY LIST

EFFECTIVE 16:00 01 April – 24:00 02 April 2011

LWG	Spill to 120% TDG
LGS	Spill to 120% TDG
LMN	Spill to 120% TDG
IHR	Spill to 120% TDG
MCN	Spill to 120% TDG
JDA	Spill to 120% TDG
TDA	Spill to 120% TDG
BON	Spill to 120% TDG

CHJ	Spill to 110% TDG
GCL	Spill to 110% TDG
DWR	Spill to 110% TDG
CHJ	Spill to 115% TDG
GCL	Spill to 115% TDG
CHJ	Spill to 120% TDG
GCL	Spill to 120% TDG

LWG	Spill to 125% TDG
LGS	Spill to 125% TDG
LMN	Spill to 125% TDG
IHR	Spill to 125% TDG
MCN	Spill to 125% TDG
JDA	Spill to 125% TDG
TDA	Spill to 125% TDG
BON	Spill to 125% TDG
CHJ	Spill to 125% TDG
GCL	Spill to 125% TDG

LWG	Spill to 130% TDG
LGS	Spill to 130% TDG
LMN	Spill to 130% TDG
IHR	Spill to 130% TDG
MCN	Spill to 130% TDG
JDA	Spill to 130% TDG
TDA	Spill to 130% TDG
BON	Spill to 130% TDG
CHJ	Spill to 130% TDG
GCL	Spill to 130% TDG

LWG	Spill to 135% TDG
LGS	Spill to 135% TDG
LMN	Spill to 135% TDG
IHR	Spill to 135% TDG
MCN	Spill to 135% TDG
JDA	Spill to 135% TDG
TDA	Spill to 135% TDG
BON	Spill to 135% TDG
CHJ	Spill to 135% TDG
GCL	Spill to 135% TDG

PROPOSED SPILL PRIORITY LIST ORDER
EFFECTIVE 00:00 03 April

LWG
LGS
LMN
IHR
MCN
TDA
JDA
BON
CHJ
GCL
DWR

Depth less than 14 ft
at MOP 733 NGVD29

Depth less than 14 ft
at MOP 733 NGVD29

Dredge Limits

Dredge Limits

Lower Granite Reservoir 2009 MBES Bathymetry

G. Teasdale, INVAV-USACE, 20 Sep 2010

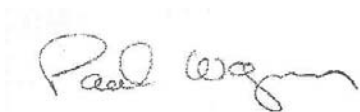


0 875 1,750 3,500 5,250 7,000 Feet

SYSTEM OPERATIONAL REQUEST: #2011-01

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: National Marine Fisheries Service, US Fish and Wildlife Service, Washington Department of Fish and Wildlife, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, the Shoshone-Bannock Tribes, the Columbia River Inter-Tribal Fish Commission..

TO:	Brigadier General McMahon	COE-NWD
	James D. Barton	COE-Water Management
	Steven Barton	COE-RCC
	David Poganis	COE-P
	Col. Steven Miles	COE-Portland District
	LTC David Caldwell	COE-Walla Walla District
	Karl Wirkus	USBR-Boise Regional Director
	Stephen J. Wright	BPA-Administrator
	Lori Bodi	BPA-PG-5



FROM: Paul Wagner, Chairperson, Salmon Managers

DATE: April 1, 2011

SUBJECT: Spill Priority List

SPECIFICATIONS:

Spill priority list for implementation (use this list until all projects are spilling to 120%) beginning April 1 through April 2 for management of excess generation spill.

Lower Granite	41 Kcfs, or 120%
Little Goose (night) / (daytime)	30% of instantaneous flow
Little Goose (nighttime)	32 Kcfs, or 120%
Lower Monumental	26 Kcfs, or 120%
Ice Harbor	95 Kcfs, or 120%
McNary	145 Kcfs, or 120%
Little Goose (daytime)	32 Kcfs, or 120%
John Day	120 Kcfs, or 120%
The Dalles	125 Kcfs, or 120%
Bonneville	100 Kcfs, or 120%
Chief Joseph	20---50---100---130--165---200
Grand Coulee	0----5-----10----20----35----50
Dworshak	37%--42%---50%---60%----70%

Beginning April 3, implement spill as described in the 2011 Fisheries Operation Plan. If there is excess generation spill, increase to the 120% at each project as described in the list above.

JUSTIFICATION:

We understand that due to present weather conditions and the need for drafting reservoirs to the flood control elevations, there is presently excess generation spill in the hydrosystem. We recognize that this spill is involuntary spill, is unique to 2011 and is not specifically designated as spill for fish passage under the Biological Opinion.

This excess generation spill presents an opportunity to enhance fish survival. Migrating juvenile salmonids have been detected at Lower Granite Dam, indicating entry into the hydrosystem. These fish numbers have been increasing since monitoring began at Lower Granite Dam on March 25, 2011. (<http://www.fpc.org/currentdaily/passindx.txt>)

The Fish Passage Advisory Committee (FPAC) has met and discussed the spill priority list developed by the US Army Corps of Engineers. The FPAC has suggested to the COE that the excess generation spill should be directed to those projects where it would enhance fish survival. The FPAC spill priority recommendations for the situation currently occurring would focus the provision of spill up to the 115/120% criteria of the WA DOE exemption beginning at Lower Granite Dam and subsequently implemented at the downstream projects; Little Goose, Lower Monumental and Ice Harbor in succession to the 120% spill level before spill is provided in the lower Columbia River.

The spill priority management presented here occurs at projects that are within the States of Oregon and Washington. The Oregon Department of Environmental Quality waiver goes into effect on April 1. The Washington Department of Ecology (WA DOE) exemption does not specify dates. We have requested guidance from WA DOE staff and they stated in conversation on March 30 and in an email dated March 31 :

"I have attached a copy of the June 30, 2010 Gas Abatement Plan approval that is required under WAC 173-201A-200(1)(f)(ii). This approval is required before operators may apply the adjusted water quality criteria for total dissolved gas.

As we discussed during our phone conversation yesterday, Ecology does not explicitly state dates in the approval letter to the Corps when the adjustment may be applied. However, David Wills is correct in his description below of the USACE 2008 approval letter which states "General fish spill seasons are April through August" and "General non-fish spill seasons are September through March". This language is not in the 2010 approval letter, but this statement remains true for the implementation of the fish passage TDG criteria adjustment. Spill to aid fish passage over hydroelectric dams is generally expected to occur in the noted time period, but Washington recognizes that flexibility to these general seasons may be necessary. It is more important to note that the adjustment criteria apply only when there is evidence that juvenile salmon migration is occurring."

Current monitoring of fish at Lower Granite Dam shows that fish are present and that spill to 120% TDG levels would aid fish passage. Monitoring in accordance with the terms of the WA DOE exemption is ongoing.

The above mentioned salmon managers believe that we are presented with a unique opportunity to enhance survival of juvenile migrating salmonids while staying within the accepted TDG requirements. Therefore, we request that the COE consider implementing the spill of excess generation as described above, beginning immediately at Lower Granite Dam.

As the fish passage season progresses, the salmon managers may make further suggested changes to the spill priority list as needed in relation to the fish migration needs or concerns. We expect to make these suggested changes through the TMT process.

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday April 6, 2011 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6845

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review March 23 and 30 Meeting Minutes [\[Meeting Minutes\]](#)
3. Vernita Bar Update - Russell Langshaw, Grant County PUD
 - a. [Priest Rapids Tailrace Temperatures](#)
4. SOR 2011-01 Lower Granite MOP Plus Two - Steve Barton, COE-NWD
5. Spring Creek Hatchery Releases - Dave Wills, USFWS
6. Chum Emergence - Paul Wagner, NOAA Fisheries
7. Water Supply Forecast - Steve Barton, COE-NWD
 - a. [RFC Snow](#)
 - b. [Westwide SNOTEL](#)
8. Dworshak Update - Steve Barton, COE-NWD and Steve Hall, COE-NWW
9. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)

- b. Fish
 - c. Power System
 - d. Water Quality
10. Other
- a. Set agenda and date for next meeting - **April 13, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 6, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Meeting Minutes

The 3/23 and 3/30 Official Minutes and Facilitator's Summary notes were posted to the TMT agenda. Some edits were provided on the 3/23 Facil. Notes that needed to be corrected, including that the COE percentages reported under the Water Supply Forecast Update agenda item were ‘precipitation’ percentages, not water supply. These corrections will be made and the notes will be re-posted later this week. TMT members said they needed more time to review the 3/30 notes. Notes from the 3/23, 3/30, 4/1 conference call, and today's meeting will be reviewed and finalized at the 4/20 TMT meeting.

Vernita Bar Update

Russell Langshaw, Grant County PUD, reported on Hanford Reach operations and discussed the figures posted to today's agenda. He said, overall, the operation has stayed within flow bands prescribed, with two exceptions: on 3/14, .2 kcfs exceedance occurred due to operator error (which was corrected), and on 4/2, a .6 kcfs exceedance occurred due to changing conditions – higher flows over the weekend – that had also been resolved. Stranding and trapping studies were underway and thus far, Russell reported, no strandings and few entrapments had been observed. This, he said, was likely due to higher flows and early emergence. Peak emergence was a few weeks out. Finally, Russell reported that a lower flow operation would go into effect just long enough to pull the egg tubes in the river to examine egg/fry survival.

Follow Up on SOR 2011-01 re: Lower Granite MOP Operations

Steve Barton, COE, reminded TMT of the COE's response to SOR 2011-01 from the navigation community for a MOP +2 operation at Lower Granite to support safe passage in the Lewiston area. The COE's planned operation for the Lower Granite pool was described as such in an email and during the 4/1 TMT conference call:

Inflows $\geq$ 120 kcfs: Operate for flood control consistent with the Water Control Manual
80 $\leq$ Inflows $<$ 120 kcfs: Operate Lower Granite pool at 734.0-735.0 ft (MOP+1)
50 $\leq$ Inflows $<$ 80 kcfs: Operate Lower Granite pool at 734.5-735.5 ft (MOP+1.5)
Inflows $<$ 50 kcfs: Operate Lower Granite pool at 735.0-736.0 ft (MOP+2)

Steve shared that flows were still ranging above 120 kcfs so the project was operating to meet flood control needs, e.g. MOP. Flows, he said, might drop over the weekend to the next tier, triggering a MOP +1 operation at the project. Steve acknowledged the concerns raised by TMT around finding a more permanent solution to the problem and the desire to have something in place by next year's migration season. The COE has been working internally to explore the possibility to deem the situation an 'emergency' per language in the settlement agreement that would allow them to move forward with dredging without a final Sediment Management Plan, which is expected to be final around December 2012. The earliest dredging season starts during the Fall 2011 but additional procedural steps would need to be completed prior to dredging (NEPA and ESA Consultation). The COE will explore opportunities to do additional soundings to 1) verify the need for MOP+2 during low flow periods this year, and 2) inform dredging actions later on.

TMT members raised questions about how the COE's actions will be coordinated with the ports to address the broader depth concerns in the area that are not part of the federal navigation channel. The COE responded that the settlement agreement allows for the local governments to 'piggy-back' on to the federal action, though there is no requirement to do so. The salmon managers also discussed the potential impacts of the MOP +2 operation on listed fish survival due to delays in travel time and potential temperature increases at the pool and expressed an interest in exploring ways to offset the effects of the operation. It was suggested that this year might also provide an opportunity to study the effects of this different operation on survival. Some TMT members felt it would be difficult to tease out the survival effects of this one operation change, though the salmon managers said it was not insignificant as an action required under the BiOp to avoid jeopardy.

After more discussion, the following next step actions were identified:

- The COE will continue to clarify and reach a decision about whether the sediment and navigation issues in the Lewiston area could be considered an 'emergency' (as defined in the settlement agreement) that would prompt them to move forward with dredging in the near term.
- Steve Barton will update TMT on a regular basis on the COE's process and actions for addressing the situation. Updates will include new data, soundings schedule, process for moving forward on dredging actions (including legally required consultations), and coordination with the ports and other local authorities.
- The salmon managers will discuss and share recommendations for operations elsewhere in the system that would help provide the flows and travel times that would be seen with a MOP operation at Lower Granite.

Finally, Steve shared that, in the event that flows go above 120 kcfs, the project would need to be operated below MOP due to flood control.

Spring Creek Hatchery Releases

Dave Wills, USFWS, shared the plan for releasing Fall Chinook hatchery fish on 4/12, and shared the USFWS proposed turbine operation at Bonneville to support passage of

those fish. He said the recommendation reflected that from past years, to operate the turbines at the lower end of 1% efficiency. This year, though, the sampling facility would be set up to monitor around the clock so the Bonneville operation could start and end in line with real time arrival and completion of passage. The recommended operation would reflect that language, to start and stop the operation when notified by smolt monitoring program personnel (and as a soft constraint, around 4 days from the period 4/13 to 4/17).

Action/Next Steps: Dave Wills will send the specific request to the COE. The COE/BPA will provide the operation as was implemented last year, with the caveat that start and stop of the operation will be coordinated real time between project operators and smolt monitoring program personnel. The language for the operation will be included in the seasonal update to the Water Management Plan. Dave will report on the operation at the 4/20 TMT meeting.

Chum Emergence

Paul Wagner, NOAA, shared that there has been plenty of depth compensation at the chum spawning areas this year. That said, an official ‘chum emergence’ date will be set based on the chum emergence model estimates, which will be run before the next TMT meeting. TMT will revisit this issue on 4/20 when an official estimated date for chum emergence is known.

Water Supply Forecasts

Steve Barton, COE, updated TMT on actual conditions and the latest water supply forecasts. March precipitation was above normal in all parts of the basin including Canada. The water year (October-March) also showed normal to above normal conditions overall, with the Snake above Grand Coulee at 115% of normal; above Ice Harbor at 123% of normal, and the Columbia above The Dalles at 116% of normal. More precipitation was expected to enter the system in the near term, with possibly some cool temperatures indicating that snow melt/ runoff was not going to begin just yet. Steve also reported that SNOTEL sites indicated normal to above normal snow pack in the Canadian and US Columbia Basins, with highest percentages in the Flathead and Kootenai areas.

Looking ahead, early bird forecasts showed the following runoff:

- Grand Coulee April-September – 70.1 MAF (110% of normal)
- Lower Granite April-July – 24.5 MAF (114% of normal)
- Libby April-August – 7.02 MAF (112% of normal)
- Dworshak April –July – 2.96 MAF (112% of normal). Steve noted that other forecasts for Dworshak showed a range up to 3.38 MAF.

Reclamation’s April final forecast for Hungry Horse:

- April-July – 2.56 MAF (128% of normal)

Dworshak Operations Update

Steve Barton, COE, showed the inflow and elevation graph for Dworshak, noting that there was an inflow spike of 35 kcfs around 4/1. The project was currently operating outflows at 22 kcfs (up from the previous 18 kcfs) to manage the high inflows in to the

project. Discharge of 22 kcfs resulted in TDG levels of 118%. Steve said the project would likely intersect with the flood control rule curve before the end of April, which would dictate the target elevation.

Operations Review

Reservoirs – Libby was at elevation 2364.6’ and passing inflows, with 4.7 kcfs in and 7.7 kcfs out. Albeni Falls was passing inflows with 40.6 kcfs in and 39.7 kcfs out, at elevation 2055.6’. Dworshak was at elevation 1472.2’ with 22.3 kcfs outflows. Day average outflows were: 138.6 kcfs at Lower Granite; 181.2 kcfs at Priest Rapids; 349.8 kcfs at McNary; and 391 kcfs at Bonneville – all were above the previous week’s average. Hungry Horse was at elevation 3497’, with 9.5 kcfs outflows (1 kcfs spill at 105% TDG). John Roache, Reclamation, shared that Hungry Horse would likely need to increase spill and that the flood control target would likely drop with the increase in the water supply forecast; TDG monitoring equipment is in place to record TDG during spill operations. Grand Coulee was at elevation 1245.8’ and drafting based on early bird forecasts; adjustments will be made once the final forecast is out on 4/11.

Fish – Paul Wagner, NOAA, updated TMT on fish counts. Yearling Chinook counts at Lower Granite were 24,000; subyearling counts were 361. Juvenile coho counts were 200 at Lower Granite and Bonneville. Steelhead counts at Lower Granite spiked up to 311,000 on 4/3 mostly due to hatchery releases. More recently, counts were 76,000. Sockeye counts (likely kokanee) at Lower Granite were 2,000. Lamprey counts at Lower Granite were 400, and 5,000 at John Day. Adult Spring Chinook counts at Bonneville were 44, and 70 steelhead were counted at Bonneville. A commercial fishery began yesterday (4/5); Washington’s Charles Morrill said he would share a more detailed update at the next TMT meeting.

Power system – BPA is working on an ‘environmental re-dispatch’ plan to manage wind integration with the current situation of below market spill in the system. This plan was not yet final or in place.

Water quality – Scott English, COE, showed a table of TDG percentages at each of the projects, noting that with involuntary spill happening at almost all projects across the system, some TDG exceedances had occurred – although not far outside the state water quality waivers. It was noted that McNary, Lower Granite, John Day and Bonneville were all being operated at full load capacity. While the exceedances were not causing concerns for the fish yet, BPA’s Scott Bettin offered that one solution would be to operate McNary outside 1% generation to help manage TDG levels. Also, the smolt monitoring program planned to study gas bubble trauma effects and Paul Wagner, NOAA, said he would report on this at the next TMT meeting.

Russ Kiefer, Idaho, raised a potential concern and requested more discussion about how to best manage TDG in the system, considering that two turbines are out of service at Lower Granite causing higher gas levels at the project and impacting how downstream projects (Little Goose and Lower Monumental) are operated in order to meet TDG waiver criteria at those projects. Russ expressed interest in having regional discussions

about ways to address this issue to allow for the best in river migration conditions possible. It was noted that Washington has maintained a 115% TDG limit at the forebay of these projects and that any change to that was unlikely this year due to ongoing litigation. That said, Charles Morrill, Washington, offered to work with Russ to pass on the concern to Washington DOE and inquire as to any possible flexibility on this issue this year. Likewise, Steve Barton, COE, offered to work with Russ to review the action agency's operating documents to determine if there might be flexibility for addressing the concern raised, keeping in mind the impacts on the whole system. It was also noted that, during high flows such as the current condition, the projects are managed to their tailrace spill caps, which are 120% TDG.

Next Meeting, Conference Call, April 13, 9 am

Agenda items include:

- April final water supply forecasts
- Lower Columbia spill operations
- Dworshak operation update
- Review spill priority list

Next Face to Face Meeting, April 20, 9 am

Agenda items include:

- Hanford Reach/Vernita Bar update
- Follow up on MOP operations/navigation issues at Lower Granite
- Spring Creek hatchery release operations debrief
- Chum Emergence
- Dworshak operations update
- Follow up on TDG/spill management issues
- Operations review

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 6, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, USFWS, Washington, Montana, BPA, NOAA, CRITFC/Umatilla, Oregon, the Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Review March 23 and 30 Meeting Minutes

Finalizing the facilitator's notes and official minutes was postponed until the next face-to-face TMT meeting on April 20.

3. Vernita Bar Update

Russell Langshaw, Grant PUD, gave a report on the Priest Rapids spawning protection program. Currently the operation is 1,047 temperature units from the initiation of spawning. In the last 30 days, mean discharges were 137.4 kcfs and the mean daily delta was 132.5 kcfs. There was a minor exceedance of 0.2 kcfs in March. In the past week, discharges have been 152.2 kcfs with a daily delta of 37.9 kcfs and a daily delta constraint of 51.4 kcfs. There was another minor exceedance of 0.6 kcfs on April 2, a result of changing conditions over the previous weekend. Flows were bumped up to 175 kcfs for the rest of the weekend which resolved the situation.

Entrapment studies are going well, and no stranded fish have been found in Vernita Bar Reach so far. Flows are high so emergence should pick up quickly. The 36 kcfs zone reached 1,008 TUs a week ago, which means emergence is nearly through its first quarter. Removal of tubes in the reach tomorrow will put discharges in the 80 kcfs range for 5-6 hours, then protection flows will return to normal. Langshaw will give TMT another report on April 20.

4. SOR 2011-01 Lower Granite MOP Plus Two

Today's discussion followed up on SOR-2011-1, discussed in detail on TMT's April 1 conference call. The COE's response and operational proposal to SOR-2011-01 identified minimum safe navigation depths and took backwater effects into consideration, which will minimize the effects on MOP operations to the extent possible while providing safe navigation in the federal channel. Concerns were expressed that a long-term solution be found to this problem

between now and when the sediment management plan is scheduled to be completed in December of 2012.

In response to these concerns, the COE is working on intermediate measures to address this situation. Meanwhile, inflows at Lower Granite since April 3 are in excess of 120 kcfs, thus the maximum flood control elevation for Lower Granite is 734 feet, i.e. MOP. Current projections show inflows in excess of 120 kcfs through April 9, so the project will likely remain at MOP until then. Inflows this weekend are expected to drop below 120 kcfs, at which time the operation will shift to MOP plus 1, or 734-735 feet until flows drop below 80 kcfs. In the April 1 TMT call, there were no objections to implementing this operation in light of the safety concerns, and the COE is moving forward with the proposed operation. Between now and the next passage season, the COE will work on tools to improve channel conditions and look for opportunities to avoid having to operate outside of MOP again next year. This SOR will be posted to the TMT website and as a seasonal update to the WMP.

Rick Kruger, Oregon, asked why the COE doesn't dredge immediately under the emergency conditions clause in the settlement agreement. The COE is looking closely at language in the settlement agreement that might provide some flexibility, Barton replied. It would take an aggressive schedule to meet the ESA requirements to dredge this coming fall or winter, Steve Hall, COE, said. Another sounding is planned for next September, including a full survey of the confluence, which will pinpoint the actual depths needed for navigation. Tom Lorz, CRITFC/Umatilla, cautioned against pursuing fixes that only shift problems around with flows.

As we move closer to MOP plus 2, we need to look at some other operations, maybe trying to decrease the travel time of fish at other projects, Kruger said. More information is needed on why light loading can't be used to reduce the depth requirement. Oregon won't consider this issue resolved until we don't have to face it again. There are places outside the navigation channel that won't meet the navigators' requirements anyway. Barton said the ports are pursuing dredging by "piggybacking" onto the federal dredging effort.

Jim Litchfield, Montana, asked how MOP plus 2 will affect particle travel time. In a worst case scenario of 40 kcfs in the river, the change in water particle time, based on one estimate was 5 hours through Lower Granite, Russ Kiefer, Idaho, replied. This is estimated to increase steelhead travel time by 7 hours. Because Idaho doesn't run smolt monitoring traps in Lower Granite reservoir for subyearling summer migrants, we don't have a good understanding of their travel time through the reservoir. Kiefer asked, have the Action Agencies thought about ways to adjust operations to keep fish protection measures in the same range we'd normally get in a good flow year like this? Barton said he wasn't aware of any such adjustments but suggestions would be welcome. FPAC will discuss this issue further.

Russ Kiefer said Idaho is concerned the MOP plus 2 operation deviates from the suite of actions that NOAA determined would operate together to avoid jeopardy in all types of flow years. For this effort to work, the lower Snake reservoirs need to operate at MOP during passage season. Litchfield and Wagner noted that survival data already exists to analyze this effect.

Dave Statler, Nez Perce, pointed out that, in addition to travel time, MOP plus 2 could impact temperature operations during the hottest period of summer. A higher pool means increased volume in Lower Granite, which the augmentation and temperature cooling releases from Dworshak are trying to moderate. Wagner said the operation will probably be close to MOP for a good part of the season. The varied life history of subyearlings makes measuring their survival rates difficult.

To respond to the MOP plus 2 concerns, Gumpert suggested the COE document progress toward a solution by putting the steps and timeframe into a document to share with TMT. Under peak flow conditions, Lower Granite might have to operate at lower than MOP to provide flood control at Lewiston, Barton said. TMT will follow up on this issue at its next meeting.

5. Spring Creek Hatchery Releases

Spring Creek Hatchery is getting ready to release approximately 6.15 million juvenile fall Chinook on April 12, Dave Wills, USFWS, reported. On the same date, the Little White Salmon hatchery will release 1.2 million tule fall Chinook. USFWS would like to request the same operation as in past years, operating the turbines in the lower portion of the 1% range.

The one change is that the smolt monitoring facility plans to monitor sampling during off-hours, so when tule fish hit the project, they can notify the control room to start and end the operation in real time. Wills requested this operation to begin when notified by SMP personnel, no later than 0600 hours on April 13, continuing as a hard constraint until SMP personnel report a significant drop on tule collection, or at 1700 hours on April 17, whichever comes first. Then the operation would continue as a soft constraint for another 4 days or so for fish that lag behind.

Scott Bettin, BPA, asked why all 7 million fish are being released on the same day if gatewell crowding is an issue. Researchers tested gatewells and found they were not crowded like when Spring Creek fish were passing. The advantage of releasing them all at once is less time for the constrained turbine operation, Wills explained. Caveats from last year's operation should carry over to this year, with adjustments as flows increase.

The COE can accommodate the real-time aspect of this request, assuming staff are available in the smolt monitoring facility, Barton said. The COE will issue a teletype to implement the operation as requested. This operation will become part of the seasonal update to the 2011 WMP. Wills will report back to TMT on April 13.

6. Chum Emergence

Chum are well protected this year with a Bonneville tailwater elevation of 28 feet, so there's plenty of depth compensation, Wagner said. The pre-season estimate for emergence is April 28, Bettin said. He will present TMT with chum emergence data at its next meeting, based on the preseason estimate.

7. Water Supply Forecast

Precipitation: Barton described how precipitation has verified relative to assumptions in March. The official forecast for April assumed 110%, then 90% of normal, which turned out to be low. Observed precipitation has exceeded 100% of normal throughout the basin to date.

Barton gave basin by basin data for March 1-27:

- Canadian portion of Columbia – 132% of normal
- Kootenai basin – 176% of normal
- Pend Oreille/Spokane – 163% of normal
- Snake River above Ice Harbor – 188% of normal
- Columbia basin above The Dalles – 178% of normal
- Clearwater – 134% of normal

For October through March, all basins were above normal:

- Columbia above Grand Coulee – 115% of normal
- Snake River above Ice Harbor – 123% of normal
- Above The Dalles – 116% of normal

The basin as a whole is above normal for the entire water year, Barton said. If it stopped raining now for the rest of the year, precipitation would still be above normal for the year. The first half of April is expected to continue this pattern, with 120% of normal precipitation according to the RFC.

Snow pack: According to SNOTEL data the entire basin has normal to above normal snow pack, with the highest amounts in the Flathead region. Snow pack is near normal in the central Washington Cascades and Okanogan ranges. This is the peak of the snow accumulation period, especially in the Snake. With the cool wet weather recently, snowpack is increasing. Snowpack percentages are as follows:

- Kootenai basin – 131% of normal
- Flathead basin – 138% of normal
- Idaho panhandle – 116-120% of normal
- Salmon River basin – 98%-108% of normal
- Cascades – 120% of normal
- Above the Cascades –115% of normal

Runoff: The RFC early bird forecast was issued March 31, Barton said. Future precipitation is assumed to be 120% of normal for the first half of April and normal for the rest of the period. RFC projections are:

- Grand Coulee, April-September – 70.1maf, 110% of normal
- Lower Granite, April-July – 24.5 maf, 114% of normal
- Libby, April-August – 7.02 maf, 112% of normal
- Dworshak, April-July – 2.96 maf, 112% of normal

The latest COE official forecast for April-July at Dworshak is 3,387 kaf, a slight increase from the COE's March final forecast. The early bird water supply forecast is still 2,900-3,000 kaf, with an STP average around 3,300 kaf, Barton said. The standard regression forecast is about the same as earlier, about 2.9 maf, Hall said. The standard regression and RFC water supply forecasts are all around 2,900-3,000 kaf, with the ESP and principal components forecasts hovering around 3,300 kaf, Barton said.

The BOR released its official runoff forecast for Hungry Horse yesterday – 2,566 kaf for April-July, or 128% of normal, John Roache reported. Significant snow has been building since then.

8. Dworshak Update

Barton presented an updated plot for Dworshak, which reflects the recent spike in inflows. Peak Inflows on a daily average basis were around 35 kcfs. Discharge was 18 kcfs, recently ramped up to 22 kcfs. The COE plans to make releases from Dworshak to meet system flood control requirements with refill triggered by intersection with the flood control refill curve. Official flood control guidance for mid-April is 1,445 feet elevation, with a deviation granted to 1,451.4 feet. Gas levels at Dworshak are 118% TDG. The project has filled a little over 10 feet with recent rains. The challenge is to manage release with all these factors in mind, transitioning to refill while still providing system flood control. The project will likely intersect the FCRC prior to the end of the month, which is typical of Dworshak.

9. Operations Review

a. Reservoirs. Libby is at 2,364.4 feet elevation, operating at flood control with inflows of 4.7 kcfs and discharges of 7.7 kcfs. Albeni Falls is at 2,055.6 feet

elevation, passing inflows of 40.6 kcfs and discharges of 39.7 kcfs. Dworshak is at elevation 1,472.2 feet, with inflows of 22 kcfs.

Lower Granite is releasing outflows of 138.6 kcfs. The prior week's average was 113.2 kcfs. Priest Rapids is releasing 181.2 kcfs, with a prior week average of 162.2 kcfs. McNary is releasing 349.8 kcfs with a prior week's average of 287.7 kcfs. Bonneville's highest discharge of the season so far yesterday was 391 kcfs, with a prior week's average of 301.7 kcfs.

Hungry Horse is at elevation 3,497 feet, with outflows of 9.5 kcfs. One kcfs of that is spill, with another 1 kcfs spill expected tomorrow. Gas levels yesterday were 105-106%. The end of April flood control target is 3,493.7 feet based on the March forecast of 121% of normal. Grand Coulee is at 1,245.8 feet, with a goal of drafting a foot per day. The early bird forecast indicates this much draft is needed. Drumgate maintenance is proceeding on track.

b. Fish. Juveniles: The yearling Chinook 2-week passage index shows 3,000 per day being caught at the White Bird trap, Paul Wagner reported. Close to 1,000 were caught at Imnaha and 250 at Grande Ronde. Lower Granite is passing 24,000 per day. Subyearling passage at Bonneville is around 1,000-3,000 per day. A few hundred coho per day are passing at Lower Granite and Bonneville. Steelhead passage numbers are a surprise at 311,000 on April 3. The hatchery release was around 76,000 fish. John Day is passing 1,600 steelhead per day. Lamprey are passing Lower Granite at the rate of 400 per day, a high based on historic reporting. They're passing at a rate of 5,000 per day at John Day.

Adults: It's spring Chinook season but they're not showing yet. Snake River steelhead are passing after overwintering.

c. Power. BPA is close to finalizing its environmental redispach procedure for taking wind off line when gas levels rise, Bettin said.

d. Water Quality. Scott English, COE, presented the Oregon high 12-hour average chart for April, which gives a snapshot of TDG levels across the region. All gages are operating, ready for spill to start April 3 on the Snake and April 10 on the mainstem Columbia. The rest of the system is in involuntary spill on all projects except Little Goose and Lower Monumental. Chief Joseph is spilling to 111% TDG. A number of projects are exceeding the state water quality standard. Bonneville could go outside the 1% efficiency operation to increase generation and reduce those numbers, Bettin said. Wagner will present a report on gas bubble trauma incidence at the next TMT meeting April 20.

Research shows that fish collected now at Lower Granite are better off bypassed than transported, Russ Kiefer, Idaho, explained. So fish are in the river, but because gas reduces spill at Little Goose and Lower Monumental, more

fish go through the bypass collection systems there. In trying to help fish, we end up passing them through the bypass system at Little Goose and Lower Monumental which reduces adult return rates. Kiefer said he wants TMT to work together to solve this problem. Barton noted that potential solutions to that problem are all in litigation. We have to look for flexibility in the court order and the WMP. He suggested that Washington coordinate with the Department of Ecology to relax the 115% forebay standard, which would help alleviate this problem. TMT will follow up on this issue at its next meeting.

10. Next Meeting

TMT will have a conference call on April 13 to discuss lower Columbia spill and the Spring Creek hatchery release. The next regular face-to-face meeting will be on April 20.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Charles Morrill	Washington
David Wills	USFWS
Jim Litchfield	Montana
Scott Bettin	BPA
Paul Wagner	NOAA
John Roache	BOR
Tom Lorz	CRITFC/Umatilla
Rick Kruger	Oregon
Doug Baus	COE
Kim Johnson	COE
Laura Hamilton	COE
Scott English	COE
Rich Hill	COE
Karl Kanbergs	COE
Russ Kiefer	Idaho

Phone:

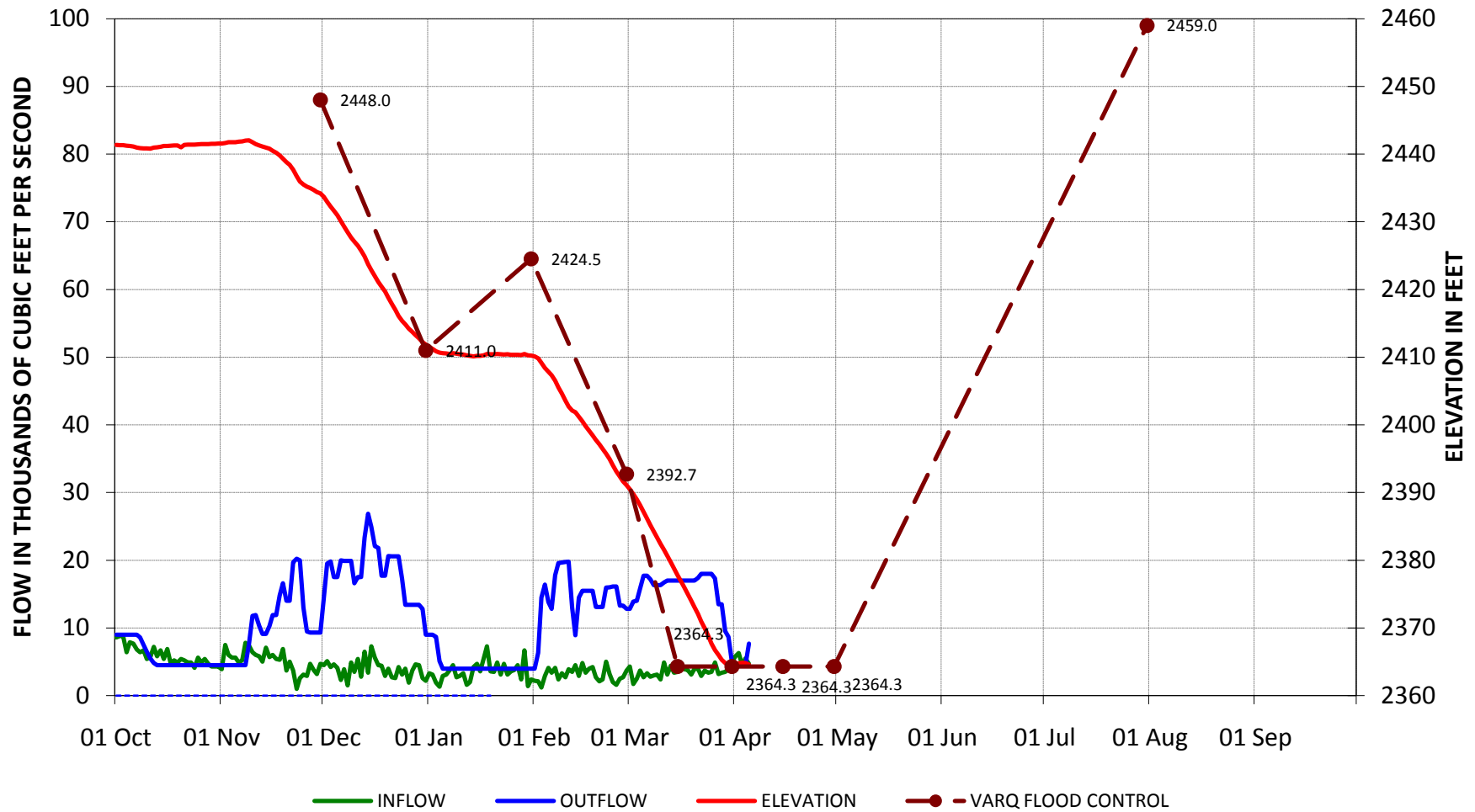
Steve Hall	COE
Dave Statler	Nez Perce Tribe
Shane Scott	PPC
Bill Rudolph	NW Fish Letter
Margaret Filardo	FPC
Rick Anderson	BPA
Barry Espenson	CBB
Russel Langshaw	Grant PUD
Tom Le	Puget Sound Energy
Doug Vine	Thompson Reuters
XX	Snohomish PUD
XX	Colorado Energy

Richelle Beck

DRA

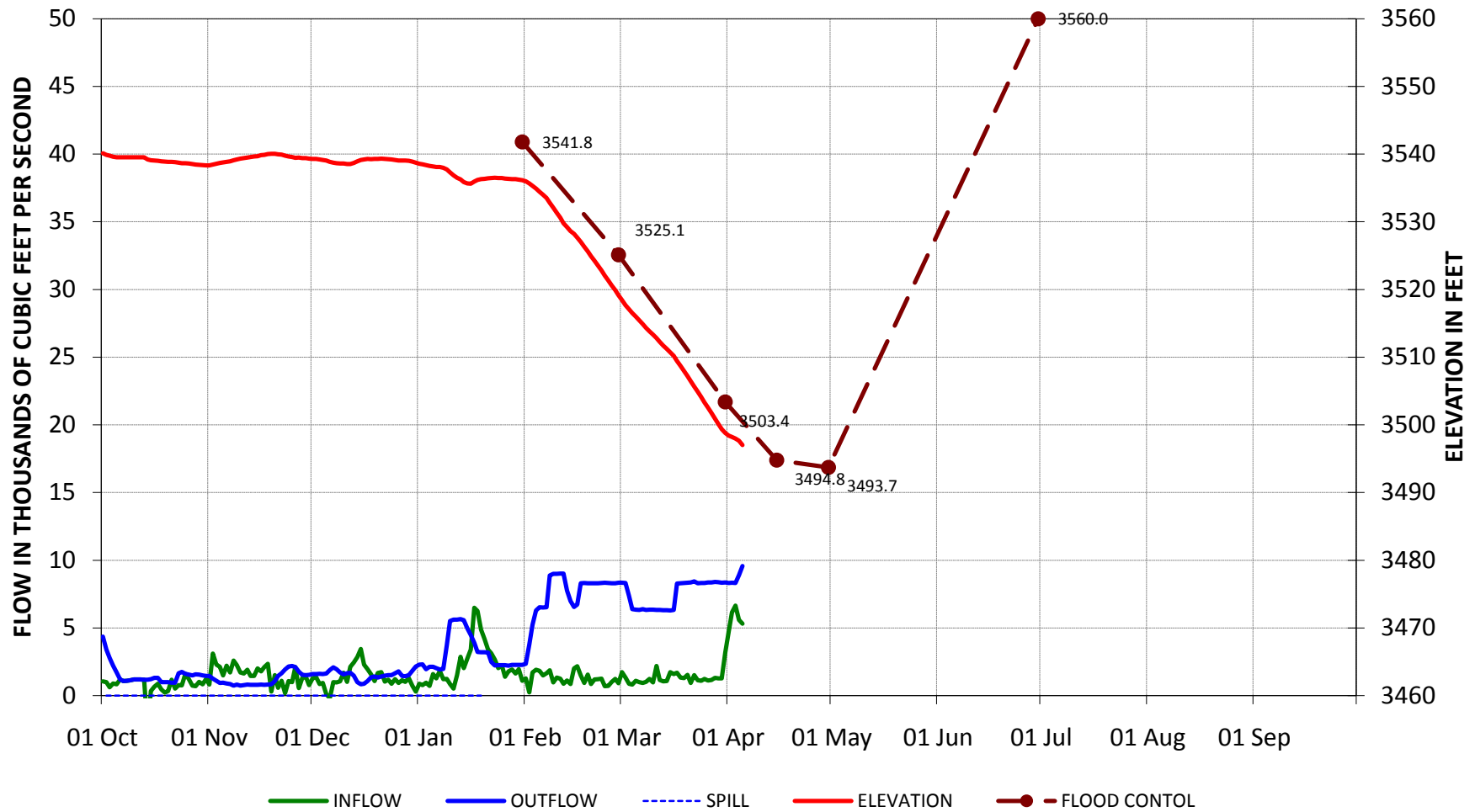
LIBBY DAM AND RESERVOIR

Water Year 2011



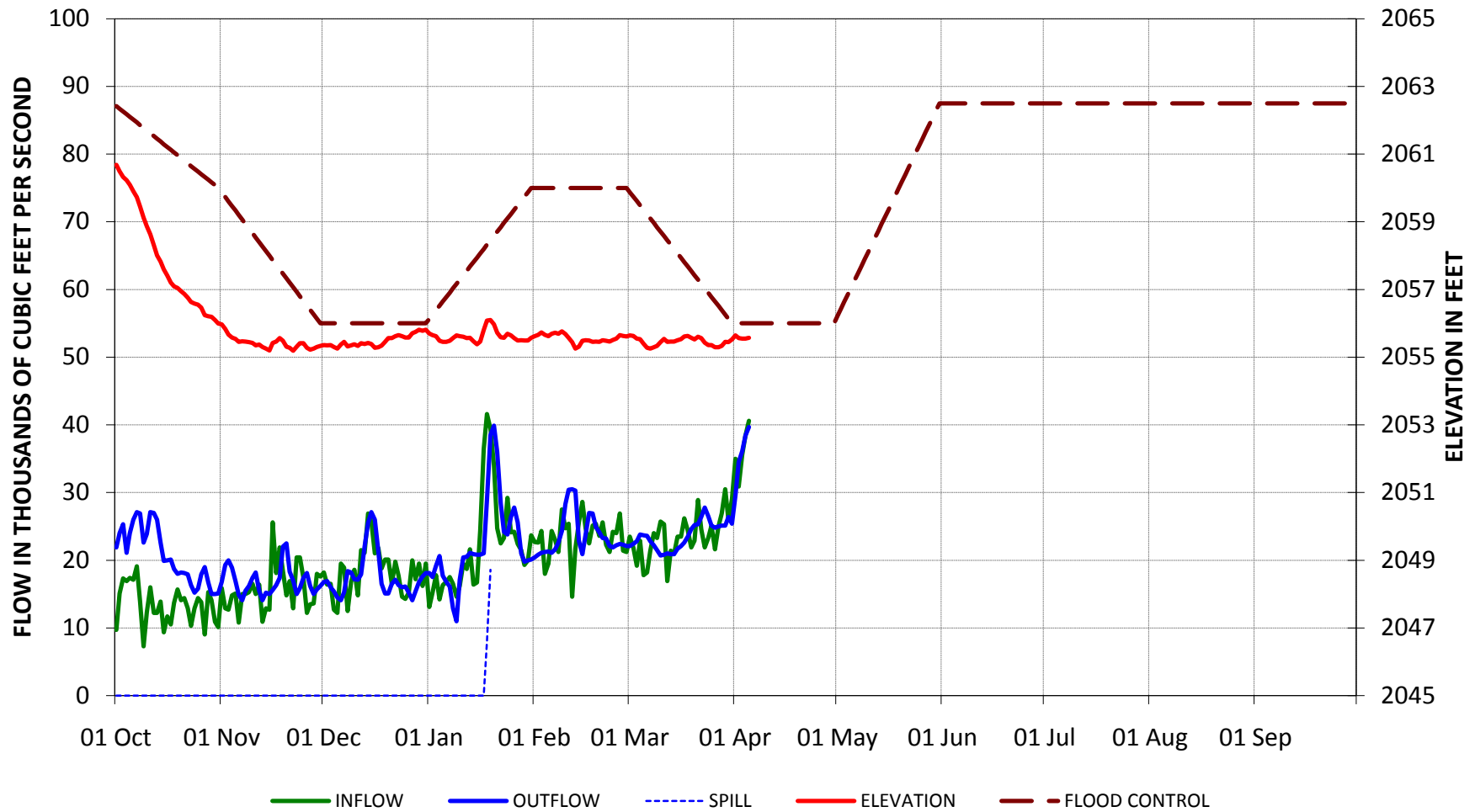
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



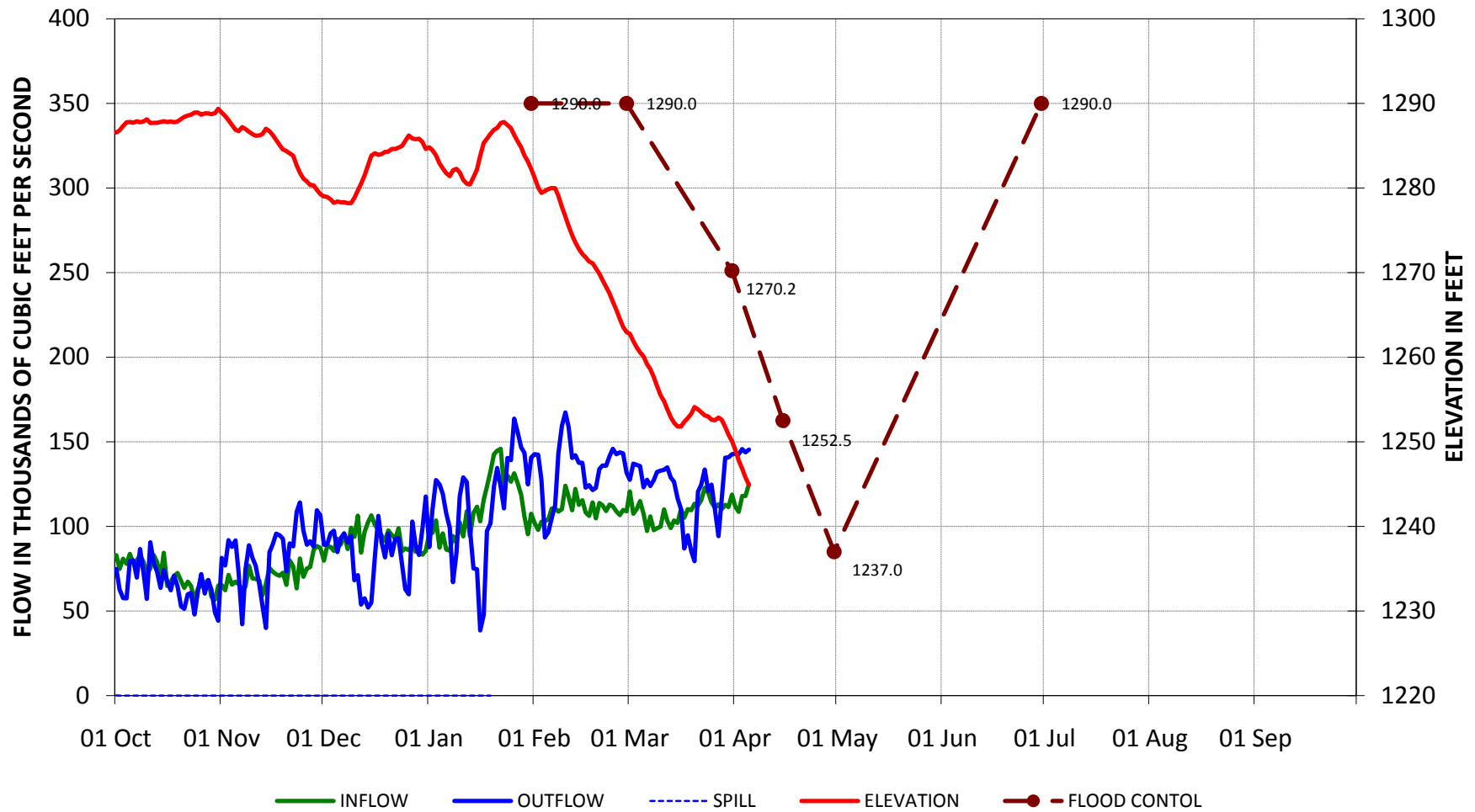
ALBENI FALLS DAM AND RESERVOIR

Water Year 2011



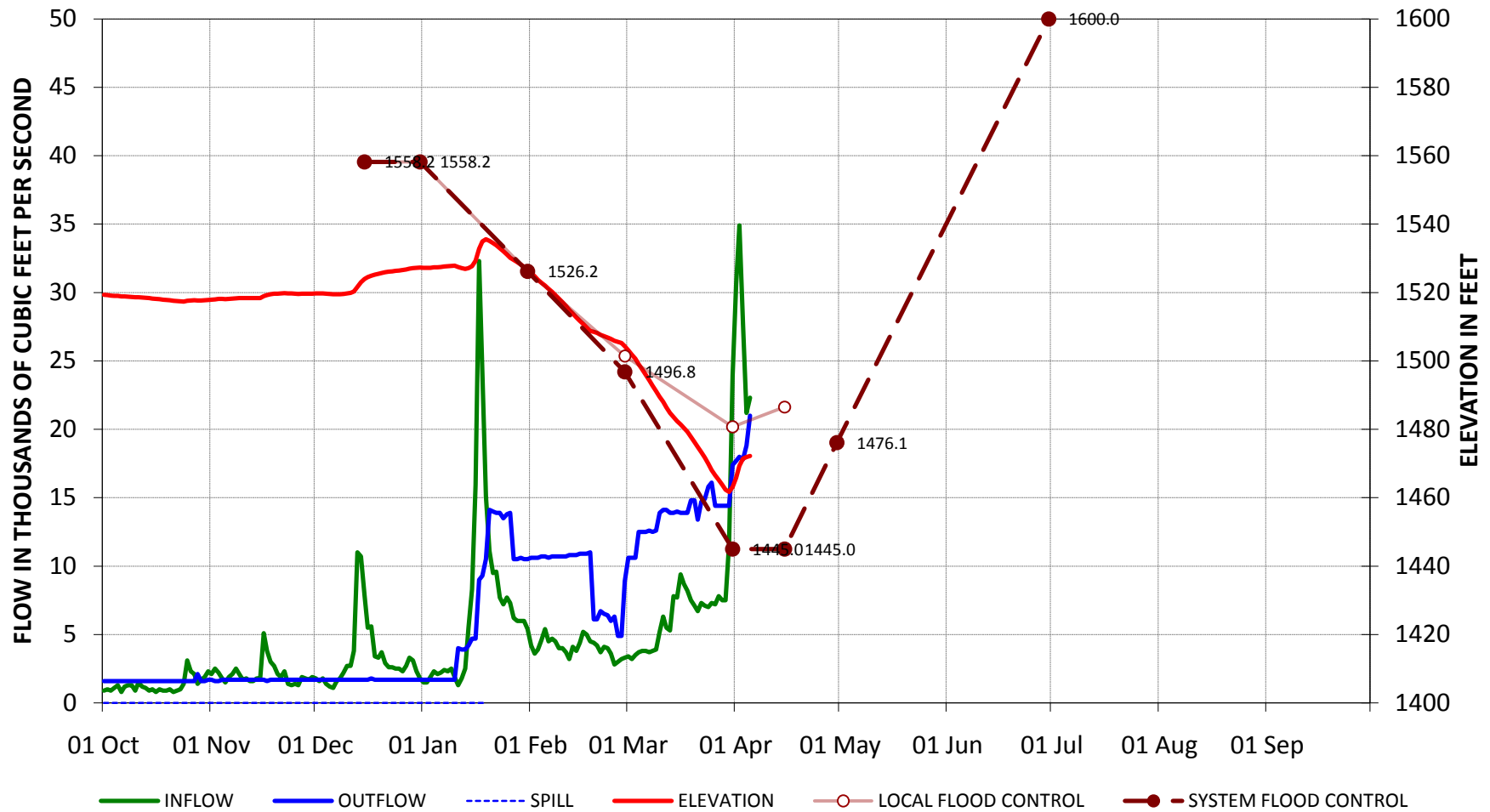
GRAND COULEE DAM AND RESERVOIR

Water Year 2011

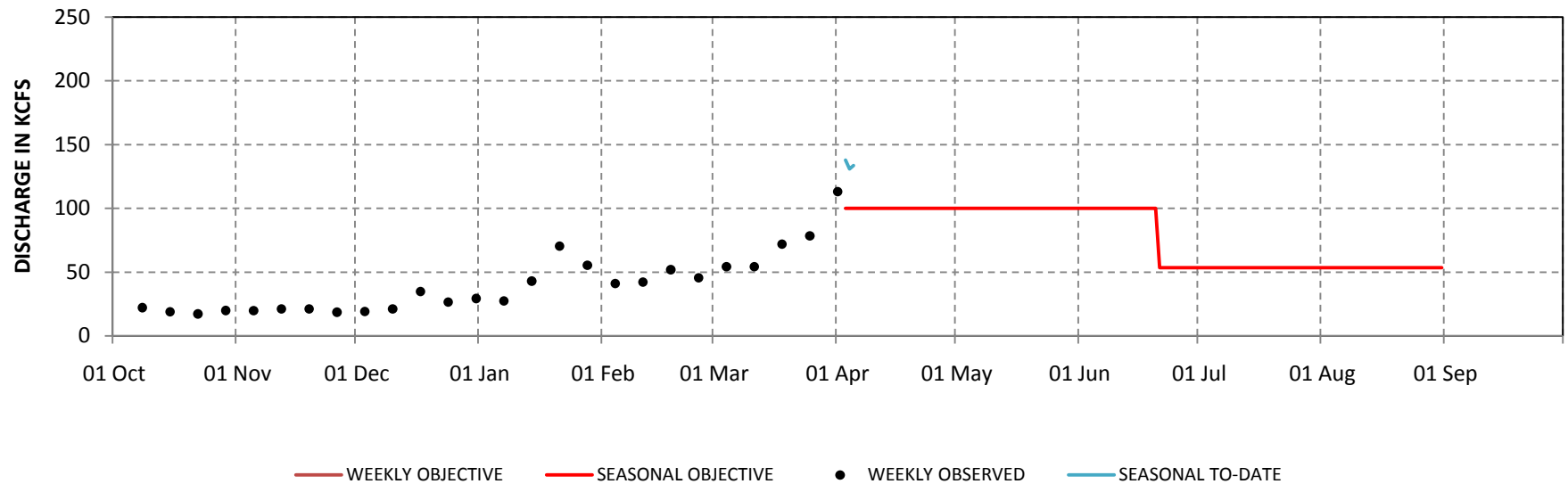


DWORSHAK DAM AND RESERVOIR

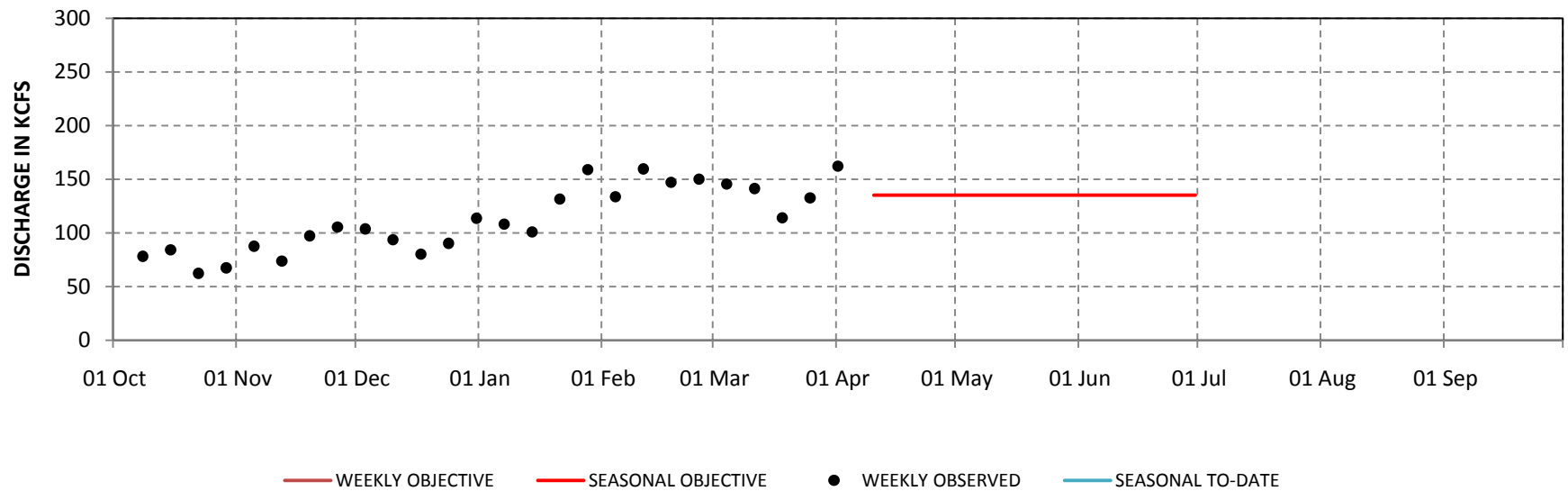
Water Year 2011



PROJECT DISCHARGE SUMMARY SNAKE RIVER AT LOWER GRANITE DAM

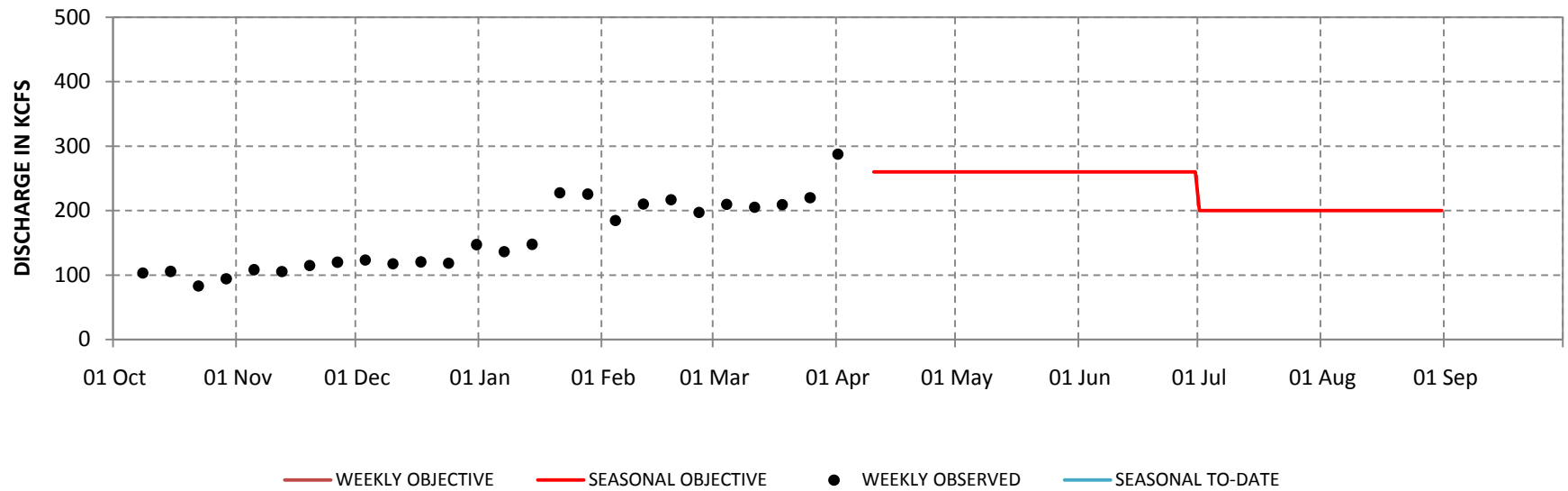


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



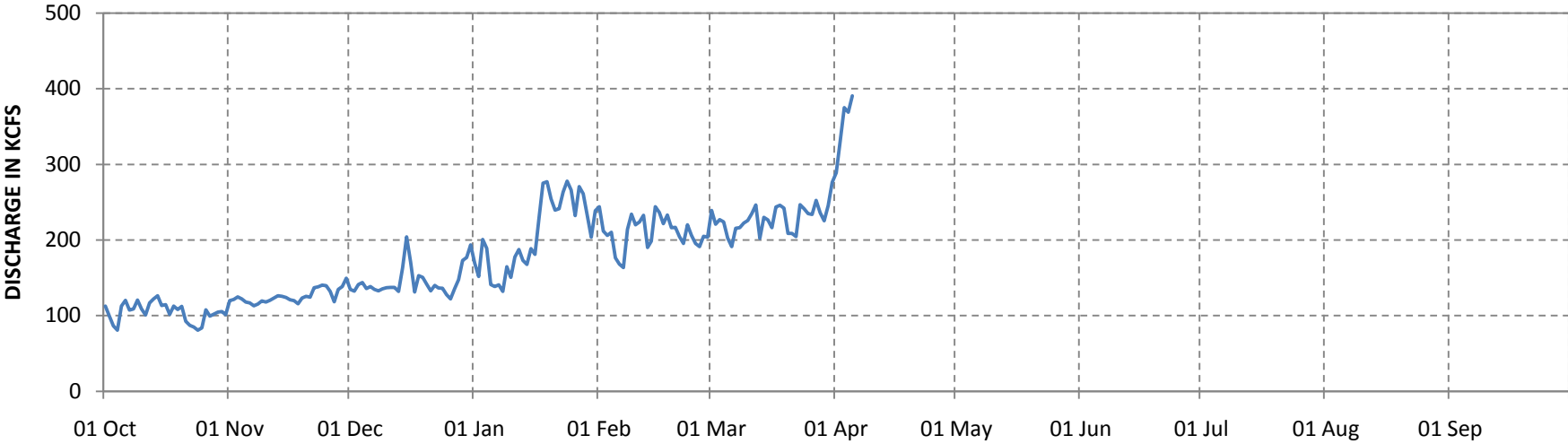
PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM

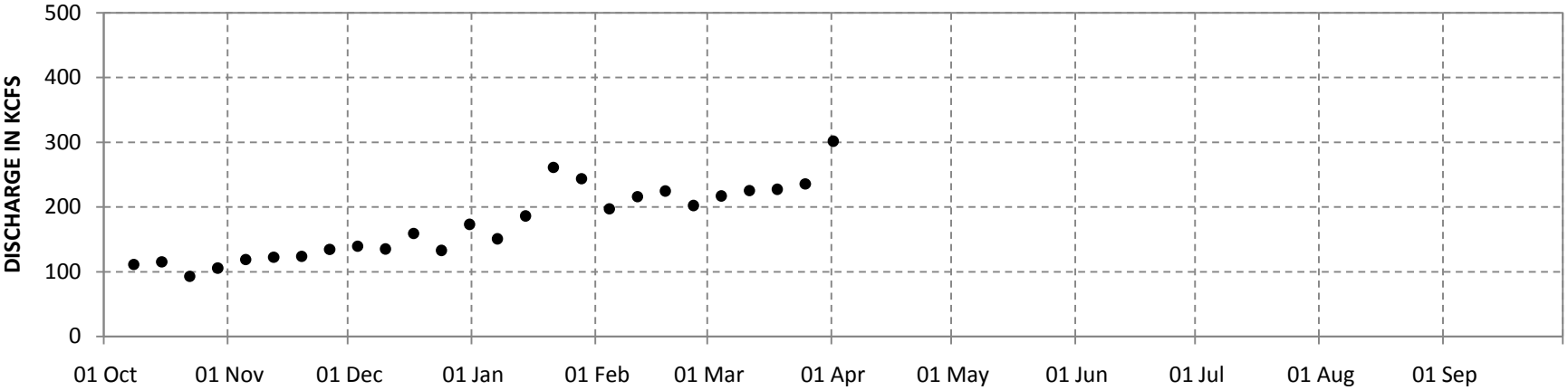


PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT BONNEVILLE DAM

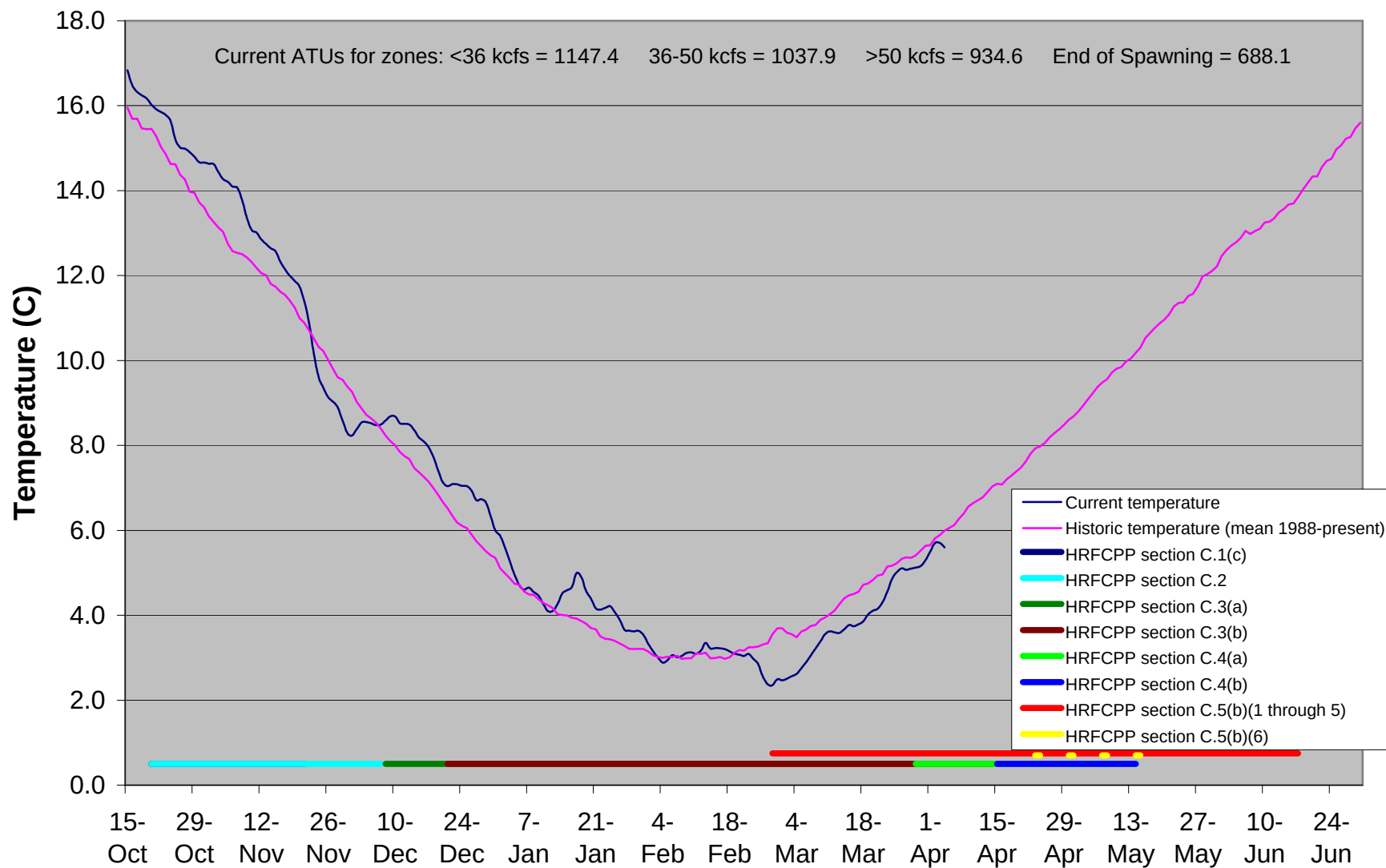


— OUTFLOW — SEASONAL OBJECTIVE



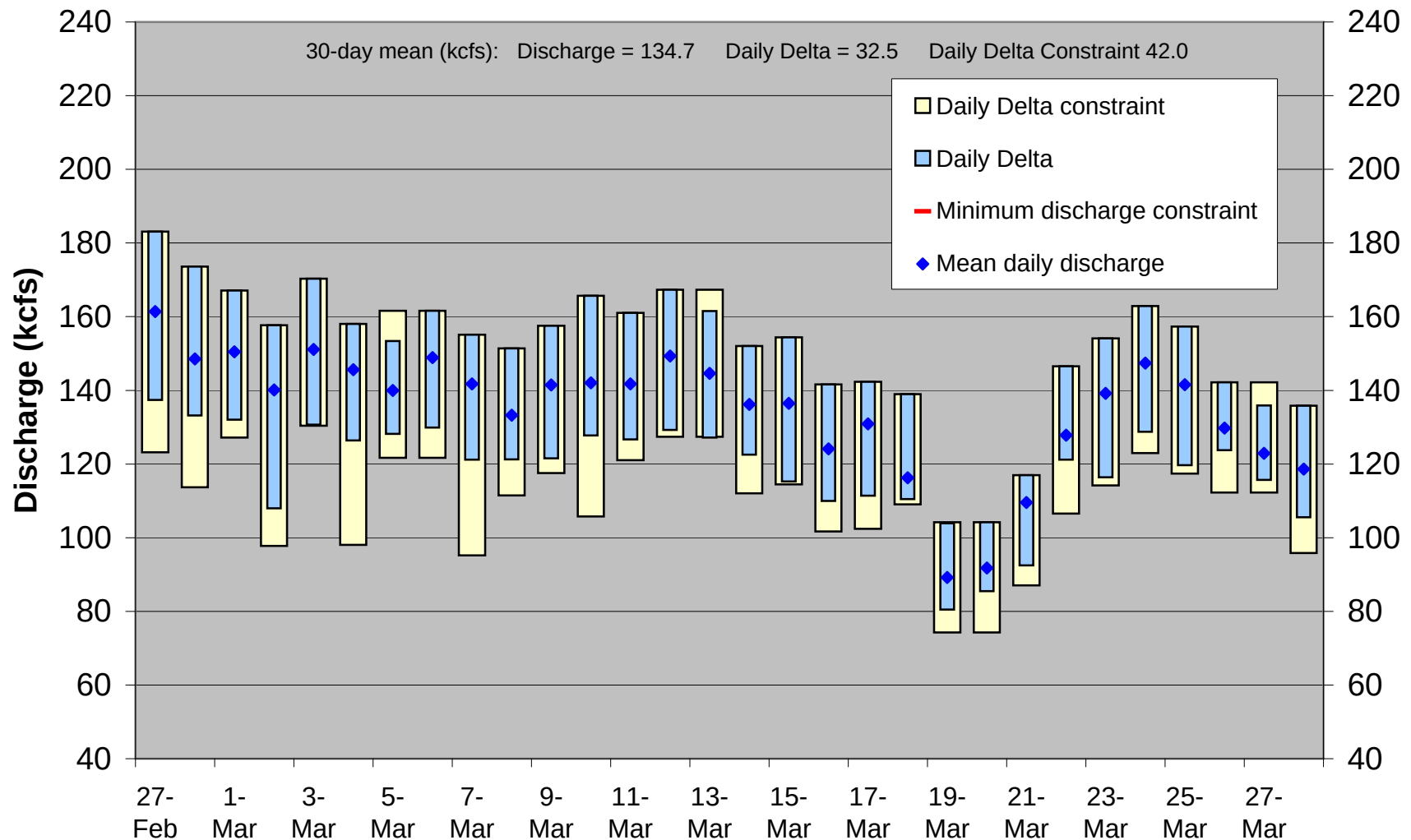
— WEEKLY OBJECTIVE — SEASONAL OBJECTIVE ● WEEKLY OBSERVED — SEASONAL TO-DATE

2010-2011 PRD Tailrace Temperatures and HRF CPP constraints



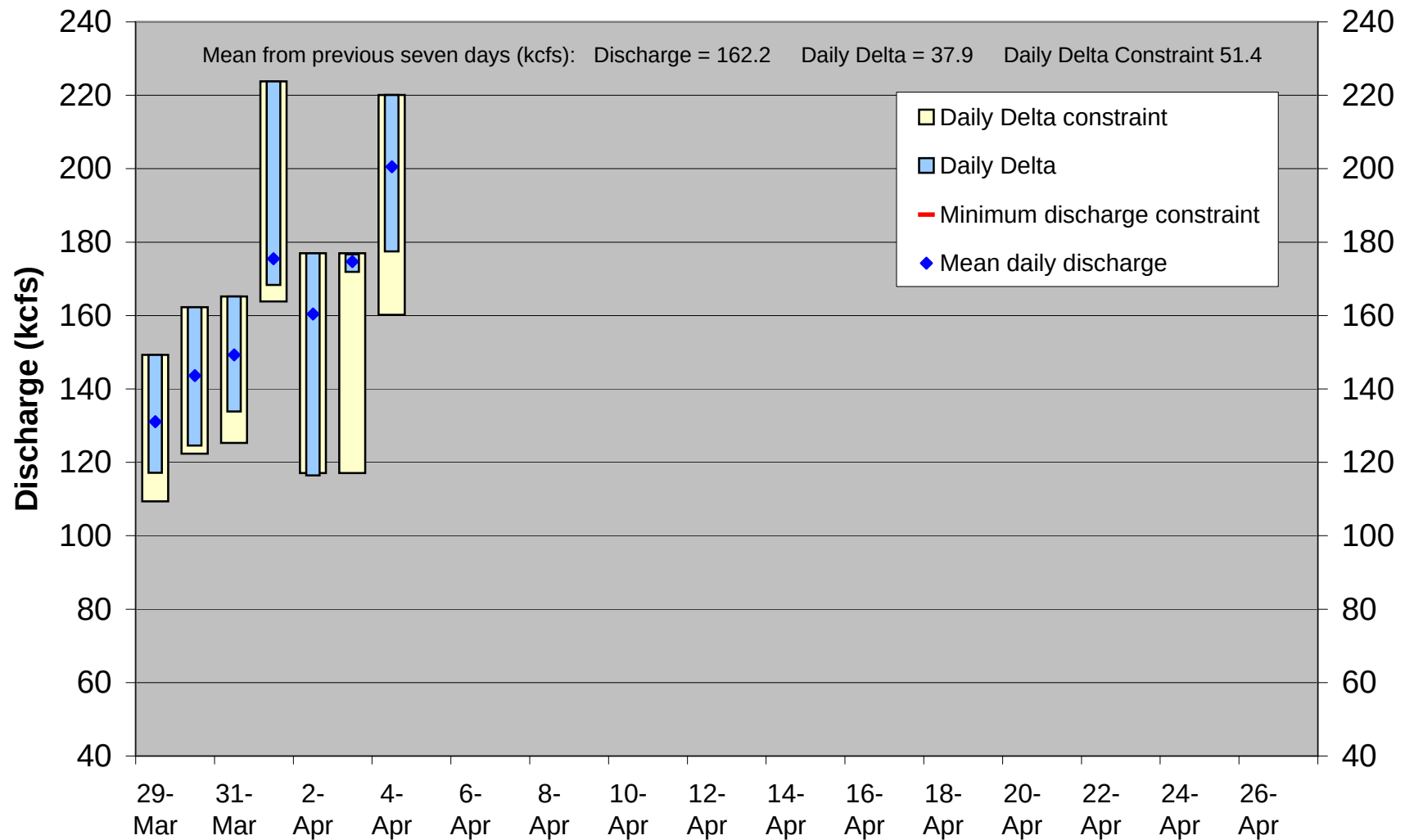
Priest Rapids Dam Operations 2011

Number of exceedances: 1



Priest Rapids Dam Operations 2011

Number of exceedances: 1



TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday April 13, 2011 9:00am - 11:00am

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. SOR 2011-02 - Lower Monumental Spill Pattern - Steve Barton, COE-NWD and Paul Wagner, NOAA-F
 - a. [SOR 2011-02](#)
3. Water Supply Forecast - Steve Barton, COE-NWD
 - a. [RFC Snow](#)
 - b. [Westwide SNOTEL](#)
4. Spill Priority List - Steve Barton, COE-NWD
5. Spring Creek Hatchery Releases - Dave Wills, USFWS
6. Dworshak Update - Steve Barton, COE-NWD and Steve Hall, COE-NWW
7. Other
 - a. next meeting - **April 20, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER REGIONAL FORUM TECHNICAL MANAGEMENT TEAM

April 13, 2011
Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

SOR 2011-02

Tom Lorz, CTUIR/CRITFC, on behalf of the salmon managers, described a request to operate Lower Monumental using a uniform spill pattern while flows remain at or above 100 kcfs. The request, he said, was offered as a way to alleviate gas issues in the river given the high flows and the turbine outages at Lower Granite. He added that the salmon managers would explore with ERDC next week the impacts that this uniform spill would have relative to eddying effects if flows were in the range of 80-90 kcfs. Tom also noted that the salmon managers felt that, while the Fish Operations Plan includes language describing Lower Monumental using a bulk spill pattern, it also leaves room for in season adaptive management, particularly on issues for which there is regional consensus.

The COE reported that current flows were above 100 kcfs and short term forecasts had mixed predictions about how long the flows would remain that high (one forecast said 100 + kcfs flows could occur through April and in to May, other forecasts indicated the flows might be a bit lower). BPA asked whether it was certain that the proposed operation would result in higher survival of listed fish, given that it had been determined through previous studies that a bulk spill pattern was better for survival. Tom Lorz responded that the intent with this operation is to balance fish passage and address TDG concerns at these high flows. When asked about the expected start of transportation, the salmon managers clarified that their intent is for this operation to be guided by flows, not influenced by the start of transportation operations.

The action agencies caucused on this issue, and determined that a policy decision would need to be made on this issue. That said, the COE requested a polling of TMT members to determine their support for the requested operation:

- Idaho – Support
- Oregon – Support
- Washington – Support
- USFWS – Not on the call; signatory to the SOR
- NOAA – Support
- CTUIR – Support
- BOR, BPA, COE – Policy decision needed

- *Montana and Nez Perce, regular TMT member attendees, were not on the conference call.

Action/Next Steps: The action agencies requested more time to discuss this issue and scheduled a follow up TMT call on Friday, April 15 at 10:00 am at which time a decision will be made. [Note – the Friday call was cancelled since flows were projected to stay under 100 kcfs for some time.] The salmon managers expressed a desire for the decision to be made as quickly as possible.

Water Supply Forecasts

Karl Kanbergs, COE, reported on the April final forecasts, noting that The Dalles forecast had gone up slightly and the April – August forecast now stands at 101 maf or 100% of average. The Lower Granite April-July forecast had gone up to 25.1 MAF and Grand Coulee April-August forecast was 68.7 MAF. Karl also reported that snow conditions were average or above average across the basin and that temperatures were still cool so runoff had not begun in earnest – though the COE was readying for changing conditions. Finally, Karl reported that the Dworshak April-July forecast was ranging 3.1-3.3 MAF.

Spill Priority List

No recommended changes were shared during today's call but there was some discussion on whether John Day and/or The Dalles might be moved down the list when performance testing begins. The salmon managers and action agencies will continue to monitor conditions and operations (e.g. presence of sea lions, Spring Creek hatchery release, performance tests) and make recommended refinements to the list in the future as deemed appropriate. This item will be included on the 4/20 TMT agenda.

Spring Creek Hatchery Releases

Margaret Filardo, Fish Passage Center, reported that 6.4 million fish had been released as planned on 4/12 and started showing up at Bonneville within 8 hours. About 2,000 fish were currently in the sample tank and being 'worked up'. So far, she said, the fish looked good and mortality was below 1%. The data will be posted to the FPC website daily, and a report on the operation will be shared at the next TMT meeting. Project operators were operating the turbines to the lower part of 1% to keep the fish safe as they pass through at Bonneville.

Dworshak Operations Update

Karl Kanbergs, COE, reported that Dworshak was at elevation 1456.06' with 10.2 kcfs inflows and 24.9 kcfs outflows. Project outflows would be reduced to 20 kcfs later today to stay on track to reach a 1451.4 ' target (per Walla Walla deviation request) on 4/15; then will be reduced further as the refill curve is intersected to target approximately 1471' on 4/30. Steve Hall, Walla Walla District COE, added that a snow flight of the area would be done next week and the data will be reported to TMT. In response to a question, John Roache, Reclamation, said the Upper Snake reservoirs are being drafted for local flood control purposes.

Next Face to Face Meeting, April 20, 9 am

Agenda items include:

- Hanford Reach/Vernita Bar update
- Follow up on MOP operations/navigation issues at Lower Granite
- Spring Creek hatchery release operations debrief
- Chum emergence
- Dworshak operations update
- Follow up on TDG/spill management issues
- Follow up on SOR 2011-02
- Operations review

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 13, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BPA, Idaho, Oregon, Washington, BOR, CRITFC, FPC, NOAA, USFWS and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. SOR 2011-2, Lower Monumental Spill Patterns

At yesterday's FPAC meeting the Salmon Managers created SOR 2011-2 in an effort to deal with high flows by providing some spill relief, while also helping to alleviate gas in the river, Tom Lorz, CRITFC, reported. The SOR requests that the Lower Monumental operation switch from a bulk to a flat spill pattern. NMFS, USFWS, WDFW, IDFG, ODFW, CRITFC and the Shoshone-Bannock Tribe signed the SOR. While flows are high like this, having 2 turbines out at Lower Granite can gas up the river, and flat spill is one way to deal with that problem, Russ Kiefer, Idaho, said. Next week's ERDC trip will help confirm that the change to uniform spill will provide better conditions for juveniles without creating eddies, which have been a problem. There's still uncertainty whether uniform spill at 80-90 kcfs creates eddies. Based on observations in previous years, uniform spill of 100 kcfs doesn't create eddies.

Yesterday inflows at Lower Monumental were around 120 The COE received the SOR yesterday afternoon and will need to coordinate with external parties.

Tony Norris, BPA, said the Action Agencies should defer today and caucus. TMT members stated their views of the proposed operation:

- **Idaho** – Supports the SOR
- **Oregon** – Supports the SOR
- **Washington** – Supports it
- **NMFS** – Supports it
- **CRITFC** – Signed and supports it
- **BOR** – Caucus needed
- **BPA** – Caucus
- **COE** – Caucus

There was discussion of the expected start of transport this year at Lower Monumental under the FOP, and how that relates to the Salmon Managers'

request. Kruger asked, are we're deviating from the FOP because of a gas issue or for transport operations? Bulk spill is less advantageous once transport begins, Lorz replied. Scott Bettin, BPA, asked, doesn't bulk spill allow us to transport more fish? Steelhead numbers aren't much different, but Chinook passage increased slightly under bulk vs. uniform spill, Lorz replied. The SOR doesn't specify that the uniform spill operation should end when transport begins.

TMT took a brief break so the Action Agencies could caucus. When TMT reconvened, Doug Baus announced that the COE would need to do further coordination of this issue. Thus TMT will reconvene at 10 am Friday, April 15, for further discussion of the SOR.

3. Water Supply Forecast

Karl Kanbergs, COE, reported on the final April forecasts:

- The Dalles, April-August – 101 maf, 110% of average
- Lower Granite, April-July – 25.1 maf, 115% of average
- Grand Coulee, April-September – 68.7 maf, 107% of average

Both the RFC snow site and SNOTEL data, linked to today's agenda, show average or above average snow conditions. Some sites in the northern area are starting to reach peak snow pack, while others are still building. Long-term modeling shows that The Dalles flows are likely to reach 400 kcfs or higher this spring, depending on runoff shape. Climate indicators suggest most of April will be cooler and wetter than average. The Weather Service forecast for Dworshak is 3.1 maf, while the COE's official forecast is 3.3 maf. Under current weather conditions the snowpack at lower elevations is ripening. TMT will track this issue closely in the coming weeks.

4. Spill Priority List

There's not much new since TMT discussed the spill priority list 2 weeks ago, Kanbergs said. During that meeting the Salmon Managers expressed interest in revisiting this issue throughout spill season to see how the list should apply to changing conditions.

Norris asked whether FPOM has discussed moving the Snake to the bottom of the list during performance testing at John Day and The Dalles at the end of April. Another question is how John Day spill will look on the 115% and 120% lists. They're already close to the bottom of the list, with only Chief Joseph, Grand Coulee and Dworshak below them, Lorz replied. The COE and BPA will have additional discussions of this issue before TMT revisits it next week.

5. Spring Creek Hatchery Releases

On April 12, approximately 6.4 million fish were released and began showing up in the river within 8 hours, Margaret Filardo, FPC, reported. The sampled fish are looking good, with no indications of scaling and a mortality rate below 1%. Project turbines are being operated to keep the mortality rates low. Final data on the release will be posted to the FPC website next week.

6. Dworshak Update

Current elevation at Dworshak reservoir is 1,456.06 feet, with inflows yesterday of 10.2 kcfs and releases of 24.9 kcfs including 14.1 kcfs spill, Kanbergs reported. This morning the project ramped down to 20 kcfs which still included almost 10 kcfs spill. The April 15 flood control target is 1,451.4 feet based on a deviation request from the COE Walla Walla district. The end of April target elevation is approximately 1,471 feet based on flood control refill curve estimates. The COE expects to release approximately 5 kcfs of flow during the last 2 weeks of April depending on inflows, Steve Hall, COE Walla Walla, said.

Rich Dominigue, NOAA, asked whether there's a plan to draft Palisades and other irrigation reservoirs primarily in the Snake River basin to provide additional flood storage. That's correct, John Roache, BOR said, Reclamation reservoirs in the Snake River Basin including Palisades, Jackson, and the Boise and Payette systems all are releasing flows in order to reach their flood control targets. Flows past Milner will be increasing depending on residual runoff. Flows past Milner are currently around 10 kcfs. The COE also has responsibility for flood control in the Snake. Conditions have changed dramatically since March 1 when we were well ahead of the flood control curve, Hall noted.

Lorz asked whether 5 kcfs flow would continue from later today or tomorrow through the end of April. No, discharges are now 20 kcfs with about 10 kcfs spill through April 15, Hall replied. Dworshak will ramp down to a total discharge of 5 kcfs once it achieves its flood control elevation.

7. Next Meeting

There will be a conference call on April 15 to resolve the discussion of SOR 2011-2 (Note – this conference call was cancelled due to lower Snake River flows being under 100 kcfs). TMT will meet next in person on April 20.

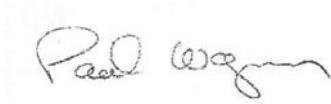
Name	Affiliation
Tony Norris	BPA
Russ Kiefer	Idaho
Rick Kruger	Oregon
Scott Bettin	BPA
Charles Morrill	Washington
John Roache	BOR
Tom Lorz	CRITFC

Doug Baus	COE
Kim Johnson	COE
Rich Hilt	COE
Karl Kanbergs	COE
Laura Hamilton	COE
Scott English	COE
Steve Hall	COE Walla Walla
Kathy Rogers	COE
Shane Scott	PPC
Dave Benner	FPC
Margaret Filardo	FPC
Tim Heizenrader	Centaurus
Russ George	WMC
Tom Le	Puget Sound Energy
Doug Vine	Thompson Reutters
Rich Dominigue	NOAA
Derek Fryer	COE Walla
Richelle Beck	DRA
Margaret Filardo	FPC
Scott Bettin	BPA
Steve Hall	COE Walla Walla
Dave Wills	USFWS
Jason Sweet	BPA
Nick Lane	BPA

SYSTEM OPERATIONAL REQUEST: #2011-02

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: National Marine Fisheries Service, US Fish and Wildlife Service, Washington Department of Fish and Wildlife, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, the Shoshone-Bannock Tribes, the Columbia River Inter-Tribal Fish Commission..

TO:	Brigadier General McMahon	COE-NWD
	James D. Barton	COE-Water Management
	Steven Barton	COE-RCC
	David Poganis	COE-P
	Col. Steven Miles	COE-Portland District
	LTC David Caldwell	COE-Walla Walla District
	Karl Wirkus	USBR-Boise Regional Director
	Stephen J. Wright	BPA-Administrator
	Lori Bodi	BPA-PG-5



FROM: Paul Wagner, Chairperson, Salmon Managers

DATE: April 12, 2011

SUBJECT: Lower Monumental Spill Pattern

SPECIFICATIONS:

Beginning immediately, use the uniform spill pattern at Lower Monumental Dam (2011 FPP, Table LMN-13) when day average flows at Lower Monumental Dam are expected to be at or above 100 Kcfs. The ERDC modeling trip planned for next week will be used to evaluate whether reducing the flow trigger to 80 or 90 Kcfs for this change is advisable. When day average flows at Lower Monumental are expected to be below this trigger, use the bulk spill pattern at Lower Monumental Dam (2011 FPP, Table LMN-12).

JUSTIFICATION:

Concerning spill patterns at Lower Monumental Dam, the 2011 Spring Fish Operation Plan¹ states:

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.

While the bulk pattern can show higher survival under certain flow and power house loading conditions, the conditions prevailing at the current time and going forward for the next several weeks favor the use of the uniform spill pattern. The uniform pattern can create a large eddy when the power house is lightly loaded. This eddy increases the risk to both fish that passed over the spillway and fish that are discharged through the juvenile bypass pipe. Under the existing conditions of a more fully loaded powerhouse the uniform pattern will not create a large eddy and will increase the number of fish being passed by way of the spillway by allowing higher spill volume.

The Ice Harbor forebay TDG monitor is typically the limiting factor for the Lower Monumental spill caps. In the 2009 study of bulk and uniform spill patterns at Lower Monumental Dam, the spill cap at Lower Monumental Dam was routinely higher when operating under the uniform pattern than when operating under the bulk pattern. This indicates that TDG from Lower Monumental may be reduced if Lower Monumental Dam were to be operated under the uniform spill pattern. During this test, average spill proportions under the two spill patterns were 0.27 for the bulk spill pattern and 0.38 for the uniform spill pattern.

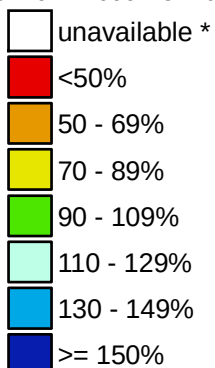
Using a uniform spill pattern at Lower Monumental Dam when flows are at or above 100 Kcfs would generate less total dissolved gas and allow a higher proportion of juvenile fish to pass Lower Monumental Dam via spillways, while not detracting from direct survival.

¹ http://www.nwd-wc.usace.army.mil/tmt/agendas/2011/0323_Spring_Fish_Operations_Plan.pdf.

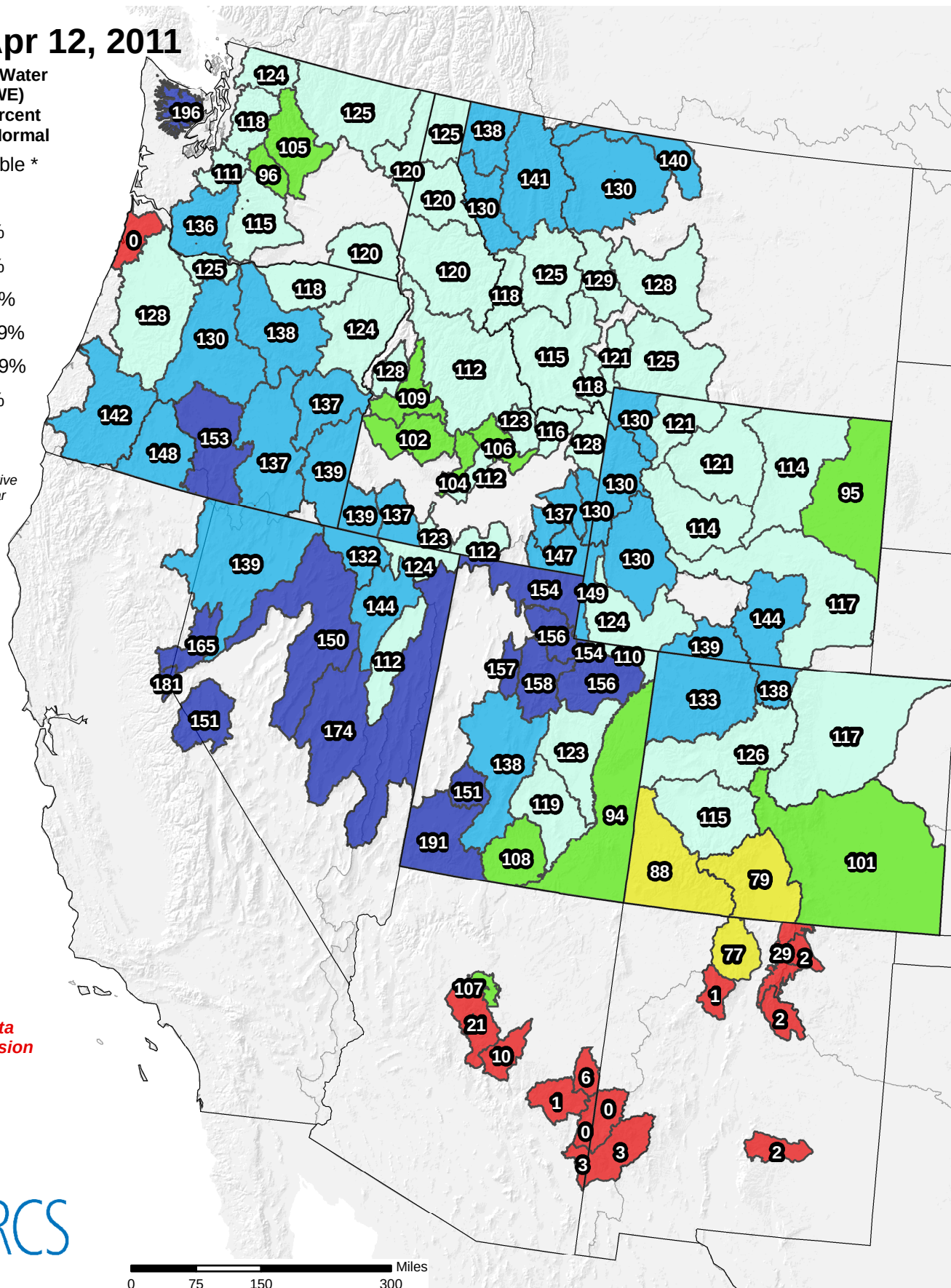
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 12, 2011

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1971-2000 Normal



* Data unavailable at time of posting or measurement is not representative at this time of year



Provisional data
subject to revision



The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>
Based on data from <http://www.wcc.nrcs.usda.gov/reports/>
Science contact: Tom.Pagano@por.usda.gov 503 414 3010

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday April 15, 2011 10:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. SOR 2011-02 - Lower Monumental Spill Pattern - Steve Barton, COE-NWD and Paul Wagner, NOAA-F
3. Other
 - a. next meeting - **April 20, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
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Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday April 20, 2011 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6845

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Please MUTE your Phone

All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.

AGENDA

1. Welcome and Introductions
2. Review March 30 April 1, and 6 Meeting Minutes [\[Meeting Minutes\]](#)
3. Vernita Bar Update - Russell Langshaw, Grant County PUD
 - a. [Priest Rapids Tailrace Temperatures](#)
4. SOR 2011 - 01 MOP + 2 Update - Steve Barton, COE-NWD
 - a. [Lower Granite held at MOP plus 2 feet April through August](#)
5. SOR 2011 - 02 LMN Spill - Steve Barton, COE-NWD
6. Spring Creek Hatchery Releases - Dave Wills, USFWS
7. Dworshak Update - Steve Barton, COE-NWD and Steve Hall, COE-NWW
8. Chum Emergence - Paul Wagner, NOAA Fisheries
9. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish

- c. Power System
- d. Water Quality
- 10. Other
 - a. Set agenda and date for next meeting - **April 27, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

D2011-01			
11-April-2011	2011-01	Columbia River Towboat Association	Lower Granite Pool held at MOP plus 2 feet April through August
1. SOR Request	SPECIFICATIONS: The objective of this SOR is to provide for safe navigation and marine facility access in the Lower Granite pool during the fish migration season. This SOR requests that the seasonal special operation of the Lower Granite pool at Minimum Operating Pool (MOP), to accommodate out-migrating salmonids, be modified to allow for two feet of water above MOP for the period of time when MOP operations are normally in place. Typically, this is from April through August. We find ourselves once again, in the absence of dredging since 2006, facing a problematic set of challenges triggered by mandated MOP operations in the Lower Granite pool and shoaling in the federal navigation channel. This has created an unacceptably high safety risk for river system navigators. Presently the approaches to the Ports of Lewiston and Clarkston have shoaling issues that reduce safe transit options and cause groundings and delays. Boats working in these areas are pushing mud, experiencing unexpected sheers (course diversions) from bank and bottom encroachment and generally have fewer places to run when traffic, especially recreational vessel traffic is heavy. The channel from the confluence of the Snake and Clearwater Rivers is problematic as shoaling is shifting and therefore hard to avoid. The area close to the Camas Prairie Railroad Bridge has lost about a quarter of its designated width. The area off the Lewis and Clark Terminal in Lewiston has also shoaled to a point where maneuvering tows is so restricted that you can no longer turn a barge in that area. Even the water along the dolphin line at the terminal is shoaling causing barge groundings while loading. The Port of Clarkston is similarly afflicted with shallow water that now threatens to foreclose cruise ship, operations at that port. In consideration of all the above, the supporters of this SOR respectfully request an change in operations to allow the Lower Granite pool to be held at MOP +2 from the beginning of April through the end of August.		
2. Participants	John Pigott, Columbia River Towboat Association, Wanda Keefer, Port of Clarkston; David Doeringsfeld, Port of Lewiston; Arvid Lyons, Lewis and Clark Terminal; Doug Matoon, Valley Vision, Inc., Glen Vanselow, Pacific Northwest Waterways Association (PNWA).		
3. TMT recommendation	TMT recommendation below is in response to the modified operation as discussed in 4. AA decision below Idaho – no objection Montana – no objection		

	Oregon – no objection Washington – no objection Nez Perce – no objection USFWS – no objection BPA – no objection NOAA – no objection *PNWA – no objection *PNWA is not of voting member of TMT but did not object to the modified operation as discussed in section 4 below.
4. AA decision	Recognizing that backwater affects the elevation of the pool at Lewiston, the Corps proposed an alternative operation to address navigation safety concerns and reduce instances when operations above MOP are required. The Corps believes this alternative is more protective of fish than the operation requested operation. The Corps alternative is to operate the Lower Granite forebay in variable 1-foot ranges between MOP and MOP+2 as a function of inflow measured at Lower Granite Dam forebay (as opposed to the proposed MOP+2 operation in the SOR). Specifically, a. when daily average inflow is greater than or equal to 120 kcfs, Lower Granite will be operated with a maximum elevation of 734 feet for flood control. b. When day average inflow is less than 120 kcfs but greater than or equal to 80 kcfs, Lower Granite will be operated at MOP+1 (734-735 feet). c. When day average inflow is less than 80 kcfs but greater than or equal to 50 kcfs, Lower Granite will be operated at MOP+1.5 (734.5-735.5 feet). d. When day average inflow is less than 50 kcfs, Lower Granite will be operated at MOP+2 (735-736 feet). The Corps' alternative operation would provide safe conditions with respect to depth in the area near Lewiston while operating as close to MOP as possible at Lower Granite. Tidewater and PNWA agreed that the Corps' alternative would address their concerns, and the Corps proposed the alternative operation to TMT on Thursday morning, March 31.
5. IT recommendation	
6. AA decision (after IT)	
7. Actual Operation	On April 9 at 0100 hours the Lower Granite Dam forebay elevation was 734.09 feet (MOP + 1, 734.0 – 735.0 feet). This marked the

	initiation of the implementation of the modified SOR operation as identified in section 4 above. The Corps will continue operating in accordance with the variable MOP operation as specified through 31 August.
8. If different from AA decision, why?	

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 20, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Meeting Minutes

No comments were offered on the 3/30, 4/1 or 4/6 Official Minutes or Facilitator Notes. They are considered final unless suggested edits are shared and noted at a future TMT meeting.

SOR re: MOP +2 Operations at Lower Granite

Steve Barton, COE, reported that the action agency's official disposition on the request will be posted on the TMT web page very soon. Current conditions at Lower Granite were such that Lower Granite was operating at MOP +1 per the COE's planned operating procedures shared via email with TMT members and discussed at the last TMT meeting. Lower Granite flows were between 120 kcfs and 80 kcfs. An upward trend in the forecast that could bump flows up to 120 kcfs or above through the rest of April would mean the project would operate to MOP/flood control. Steve clarified the tools the COE uses to make the operating decisions. The RFC's near term forecast is used, and then, within a day of the operation, the real time gauges are used to verify actual conditions in the system. There is about a ½ foot overlap between all bands except for between MOP and MOP +1, so when flows are at that threshold level, the operation might fluctuate a bit within the same day.

With respect to dredging plans, Steve had nothing to report at this time, but said he is working on getting an update and will share any information with TMT as soon as it is available. TMT will continue to check in this issue at future TMT meetings.

SOR re: Lower Monumental Spill Patterns

A request put forth by the salmon managers and discussed at the 4/13 TMT meeting led to further inquiry but no change in operations – given that flows were at or below 100 kcfs, the requested switch to a uniform spill pattern at the project when flows are above 100 kcfs was not an issue until now. Steve Barton shared that because the COE is operating under court order for ‘rollover’ operations, the action agency needs a compelling reason to make a change. Until such time, the project would continue to operate using a bulk spill pattern consistent with the 2011 Fish Operations Plan. Steve added that flows increased to above 100 kcfs on 4/19 but were likely to drop below that level today and for the next few days, according to forecasts. Steve asked the salmon

managers if they had any additional biological information that would support the requested operation, in addition to what was described in the SOR.

Russ Kiefer, Idaho, reiterated the rationale that was included in the SOR for TDG management at the project in light of the two-turbine outage at Lower Granite dam and high flow conditions, and added that a study done by the PNNL showed a biological benefit to returning adults that are collected at Lower Granite and put through the bypass vs. those that are collected at Lower Monumental. This operation, he said, would provide more flexibility at the flow ranges being considered for uniform spill. He also said the 2008-09 study that resulted in the bulk pattern decision at Lower Monumental had not considered the unique TDG issues the system is facing this year. The salmon managers will be looking to re-evaluate the FPOM-recommended bulk spill pattern in the context of higher flows such as the current conditions, and additional data.

Steve Barton responded that the COE would be open to making an adjustment during involuntary spill such as was done last year – during very high flow conditions. He also noted that TDG is monitored at Ice Harbor and from there, degassing of about 5% is expected to occur. With the uniform spill pattern, there would be no change at Ice Harbor. The change would be a 10 kcfs spill increase at Lower Monumental. Dan Feil, COE, added that the 2008-09 study showed slightly better dam passage survival using a bulk spill pattern.

TMT members asked if the unit outages at Lower Granite were anticipated in the rollover plan, to which the COE pointed out language in the FOP that contemplates outages at Lower Granite in a general way.

TMT continued deliberations around the 2008-09 spill pattern study and current system configuration and water conditions, and the salmon managers clarified that the request intended the operation to be guided by flows in the system, not transportation start dates.

Next Steps: Steve Barton said the COE would work to resolve this issue no later than Friday, and suggested a follow-up conference call to allow the COE to provide a response and decision. **TMT scheduled a conference call for Friday, 4/22 at 11 am.**

Vernita Bar Update

Russell Langshaw, Grant County PUD, shared that operations were going well so far, and as expected. The reach had accumulated about 772 temperature units from the end of spawning, and emergence had occurred in all three zones indicating that more fish would be observed in the Hanford Reach very soon. Weekend minimums will begin this weekend and continue for four weekends through emergence. A 40 kcfs band width constraint is guiding operations; the mean flow was 154.8 kcfs. One exceedance occurred on 4/7 to support the egg-to-fry survival work that Russell had reported on at the 4/6 TMT meeting. The study was successful and results will be available soon. Russell will provide another update to TMT in two weeks.

Spring Creek Hatchery Release

Dave Wills, USFWS, reported that 6.4 million fish had been released on 4/12 and arrived at Bonneville that evening. The passage index yesterday was 26,000 so the soft constraint on turbine operations will end tomorrow (4/21). Overall, Dave said, mortalities were low and there was good coordination between the USFWS, BPA and the COE. The next release will occur on May 2. TMT will discuss this item at the 4/27 TMT meeting.

Chum Emergence

Paul Wagner, NOAA, said that according to the chum emergence model, emergence ended on 4/18, and therefore the 11.5' tailwater protection operation constraint could officially be lifted.

Dworshak Operations

Steve Barton and Steve Hall, COE, reported that the project met its 4/15 flood control elevation target and at that point, discharges were decreased to set the project up to meet an end of April elevation 1471.6' per refill curve intersect guidance. To get to a July 1 refill target, about 1 MAF would need to be released; current information showed this would mean a 6.7 kcfs daily average discharge.

FPAC discussed this issue and shared their preference to shape the flows using more water now to support 120 kcfs flows at Lower Granite.

After more discussion, the COE offered the following planned operation to meet the salmon managers' objectives (and said it also met the objectives of the deviation request submitted by Walla Walla District): Run the project at full powerhouse plus 2 kcfs spill (approximately 12 kcfs) until flows go above 120 kcfs at Lower Granite, at which point the project will back off.

Action/Next Steps: All TMT members present agreed to the operation described above. The COE will check in with the Nez Perce Tribe and, barring any objections, planned to begin the operation at 1:00 pm later today.

Operations Review

Reservoirs – John Roache, BOR, reported on projects: Hungry Horse was at elevation 3484.95' with 10.5 kcfs (2 kcfs spill). A unit that was out was planned to come back on line on 4/21 and Hungry Horse would no longer be spilling at that point. Grand Coulee was at elevation 1230.0', targeting 1220.2' at the end of April. Paul Wagner, NOAA, shared his hope to avoid a potentially similar scenario that occurred in 2008 when a severe drop was needed to reach the elevation – as such he requested the BOR use a 135 kcfs weekly average outflow target at Priest Rapids as a measure of continued operations at Grand Coulee. John responded that the BOR was open to this and that he needed to check in with the Colville Tribe re: any concerns for ferry transportation and cultural impacts. He added that the maximum drawdown at the project would be 1220.2' unless the COE offered further flood control guidance. This issue will be added to the 4/27 TMT agenda.

Steve Barton, COE, reported on projects: Libby was at elevation 2358.03' and operating

with 5.4 kcfs inflows and 8.5 kcfs outflows. Albeni Falls was passing inflows at elevation 2055.5'. Dworshak was operating with 9.6 kcfs inflows and 4.9 kcfs outflows, at elevation 1455.4'. As was discussed above, the project would go to full powerhouse plus 2 kcfs spill later today, barring any objections from parties not present at the meeting. Lower Granite daily average flows were 104.8 kcfs; 136.7 kcfs at Priest Rapids; 252.7 kcfs at McNary and 286.2 kcfs at Bonneville.

Fish – Cindy LeFleur, Washington, reported that the late adult migration is likely due to temperatures and high flows, comparable to what was seen in 2006. Paul Wagner, NOAA, reported on juveniles. Yearling Chinook counts at Lower Granite were 35,000 and the numbers were picking up. Steelhead counts were plotting higher than the historical average, with a 34,000 count at Lower Granite – some of this was due to the hatchery releases. Subyearling counts at Bonneville were 16,000. Sockeye counts at Lower Granite were 1,620 – most were thought to be kokanee. Lamprey counts were steady at John Day and few at Lower Granite and Bonneville.

Power – Nothing to report.

Water quality – Scott English, COE, said all water quality gauges were operating and no exceedances were reported. Spill at Lower Monumental was expected to increase later today.

Next Meeting, 4/27 Conference Call:

Agenda items include:

- o Grand Coulee Operations
- o Spring Creek Hatchery Release
- o Transportation Operations Plan

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 20, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, NOAA, Washington, USFWS, Oregon, BOR, BPA, Idaho, CRITFC/Umatilla Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Questions or comments should be directed to the TMT chair.

2. Review March 30, April 1 and April 6 Meeting Minutes

There were no revisions today to the meeting minutes or facilitator's notes. Tony Norris, BPA, has a change to the minutes he will make via email.

3. Update on SOR 2011-1, Lower Granite MOP Plus 2

Currently Lower Granite discharges are between 80 and 120 kcfs, putting the project in the MOP plus 1 realm, Barton reported. The forecast suggests flow increases for the end of the month. There's a possibility of flows hitting 120 kcfs during that time which would put Lower Granite back into flood control operations, meaning a maximum elevation of 734 feet i.e. MOP. The COE will use the near term forecast from the RFC to plan the operation of Lower Granite in coming weeks along with looking at current inflow and day average inflow data.

In preparation for the date the operation shifts from MOP to MOP plus 1, the COE will position the reservoir for the next band and will confirm that it's time to transition, Barton said. Within a day of reaching thresholds, the operation will move to the next band. This will be happening in real time using predictive data and real time gauge readings.

Conversations are ongoing regarding actions the COE plans to take between now and the next fish passage season at Lower Granite. The COE will keep TMT informed of any new developments.

4. SOR 2011-2, Lower Monumental Spill Patterns

The Salmon Managers submitted this SOR on April 13 to request that Lower Monumental switch from a bulk to a uniform spill pattern when flows exceed 100 kcfs. Last Friday's conference call to discuss the COE's decision on SOR 2011-2 was canceled because the COE was still investigating the data surrounding this issue and flows were under 100 kcfs.

After reviewing the available information, the COE plans to continue the court-ordered rollover operation at Lower Monumental unless a compelling reason can be found to deviate from the bulk spill pattern identified in the spring 2011 Fish Operations Plan, Barton said. With Lower Monumental flows at 100 kcfs and expected to drop below 100 kcfs over the next few days, he sought a compelling reason to implement the SOR by asking the signatories to provide more information on its biological benefits.

With two turbines out at Lower Granite, uniform spill would improve the water quality of flows in the 100-160 kcfs range, which tend to generate high gas levels if spilled in a bulk pattern, Russ Kiefer, **Idaho**, said. Long-term SARs data indicate that adult return rates for fish collected at Lower Granite are higher than for those collected at Lower Monumental. If Lower Granite generates higher gas levels than anticipated, spill at Lower Monumental will have to be cut to meet water quality criteria – this is the Salmon Managers' main concern. It would mean spilling more fish at Lower Granite and putting more fish through the powerhouse at Lower Monumental. Kiefer offered to prepare a technical memo supporting the biological benefits of the SOR and acknowledged there will be debates on the meaning of the biological data when the study results are released. He explained how the rollover operation came about. The Salmon Managers initially favored bulk spill because it was associated with slightly higher rates of survival. However, that recommendation didn't incorporate the gas impacts associated with bulk spill, so the Salmon Managers are addressing it with this SOR.

Cindy LeFleur, **Washington**, asked whether the two-unit outage was part of the rollover operation from last year. If not, the unanticipated condition this year could provide a rationale for modifying the rollover. The court order recognizes that units go in and out of service for maintenance or other reasons, Barton replied. The plan was to spill 20 kcfs at Lower Granite in this case. The FOP does recognize that lack of load caused by a unit outage at Lower Granite could produce involuntary spill that exceeds the gas cap.

Last year, the COE switched Lower Granite to a uniform pattern to reduce gas during involuntary spill, Barton recalled. Gas levels in that reach of the river are typically dictated by Ice Harbor forebay levels, which at 115% tend to produce 118-119% TDG at Lower Monumental if a bulk spill pattern is used. The operational difference between bulk and uniform spill is approximately a 10 kcfs increase in spill at Lower Monumental, Dan Feil, COE, said. For both yearling Chinook and steelhead, the bulk pattern produced slightly higher levels of survival according to 2009 study results the COE reviewed. Using a bulk spill pattern wouldn't limit spill at Ice Harbor because forebay gas levels would remain the same. The results of a robust two-treatment study in 2009 indicated that spring migrant survival estimates should meet the performance standards for Lower Monumental.

The core issue isn't performance standards for juvenile survival but the whole life cycle, specifically adult return rates, Kiefer said. Tom Lorz, **CRITFC/Umatilla**, said passage numbers for steelhead in the 2009 study showed little difference in juvenile survival rates for the two spill treatments, while spring Chinook that were not transported had higher SARs. The Lower Monumental bypass could become a more confounding issue than bulk or uniform spill patterns. In general, it's better to spill fish at Lower Monumental – especially steelhead – or bypass them than transport them or send them through the powerhouse.

Kiefer pointed out that the higher juvenile survival rates associated with transportation arose before the surface passage system and spill program improved overall survival. When in-river steelhead survival from Lewiston to Bonneville was only 38%, transport was clearly of benefit, but by 2009, comparative steelhead survival had improved to 69%. Study results show that transportation no longer benefits wild spring Chinook or steelhead when in-river survival rates reach 53% or higher.

Barton asked whether the SOR envisions uniform spill only until transportation begins. No, uniform spill should be concurrent with transportation, Kiefer replied. Wagner estimated that transportation will begin on May 8 at Lower Monumental this year.

Rick Kruger, **Oregon**, thanked Idaho and CRITFC for their comments today and said Oregon supports the SOR. He noted that the Salmon Managers are unanimous in their support of this SOR. Paul Wagner, **NOAA**, acknowledged that it's hard to pin down a "magic number" at which the uniform spill pattern alleviates problems. Now that flows have dropped to a more manageable level, with gas levels at Lower Granite down from 123%, to 112%, the situation isn't as clear-cut. However, the SOR could provide a survival benefit.

Barton thanked the Salmon Managers for their detailed information today, which will aid the COE in determining whether existing conditions are unique enough to warrant a departure from the rollover operation. He emphasized that the COE will switch to a uniform spill pattern later in the season when involuntary spill occurs, as it has in prior years. TMT will reconvene in a conference call on April 22 to discuss the disposition of this SOR.

5. Vernita Bar Update

Russell Langshaw, Grant PUD, gave an update on the Hanford Reach protection flow program. Currently the operation is 772.4 ATUs from the end of spawning and 1,231.7 ATUs from initiation of hatching in the zone below 30 kcfs. Emergence is underway in all three zones. Weekend protection flows will begin this weekend and run for the next four weeks, with minimum flows based on mean daily minimums from the previous Monday through Thursday.

Mean discharges over the past week have been 154.8 kcfs, with a daily delta of just under 42 kcfs and a daily constraint of 60 kcfs. There was one exceedance on April 7 to support Grant PUD's egg-to-fry survival study. For a few hours, flows dropped to the mid-60s while 28 of the 32 egg tubes were successfully removed. Flows returned to minimums shortly thereafter. Wagner asked whether more fish are being seen now that emergence has peaked. So far, sampling crews have not found many fish, which could be due to a number of factors such as timing and flows. Langshaw will brief TMT again in two weeks.

6. Spring Creek Hatchery Releases

Dave Wills, USFWS, reported on the April 12 release of 6.4 million spring Chinook from Spring Creek Hatchery. That same day, the Little White Salmon Hatchery released 1.8 million tule fall Chinook. High flows carried the fish to Bonneville for an index count of 930,000 by that evening. By April 19, the passage index was down to 26,000, and a continued drop is expected. Overall, this year's operation has been successful, with low mortality rates and good coordination between BPA and the COE.

Cindy LeFleur, Washington, asked whether this is the first year Little White Salmon has released tule fall Chinook. There were three releases in March, April and May of 2008, Wills recalled. The March release was eliminated in 2009, but not the total number of fish needed to satisfy the U.S.-Canada treaty, so part of that production went to the Little White Salmon Hatchery.

The next Spring Creek Hatchery release is scheduled for May 2. TMT will coordinate that operation at its next regular meeting, a April 27 conference call.

7. Chum Emergence

Paul Wagner, NOAA, reported that emergence ended on April 18 according to the Battelle model, which indicates that 10% of the redds this year are in the Ives Island area.

8. Dworshak Update

The project met its April 15 flood control target of 1,451.4 feet per the deviation request made by the COE Walla Walla district, Barton reported. Discharges have ramped down since then, targeting 1,471.6 feet elevation by the end of April. Steve Hall, COE Walla Walla, reported that the project drafted heavily to meet its April 15 target and has transitioned to a refill curve. The April 30 flood control target is based on normal inflows and might need to be modified slightly based on observed inflows, which are now 115% of normal.

Speaking for FPAC, Paul Wagner said the best use of the reservoir now is to draft to a lower elevation while gas levels are still controllable, creating space to help manage gas impacts once involuntary spill begins. Using Dworshak reservoir to support a 120 kcfs flow target at Lower Granite is a good plan. Flows of 120 kcfs with two units out of service at Lower Granite would produce spill of about 45 kcfs, which is manageable from a TDG standpoint.

There's approximately 2 maf of storage volume now in Dworshak reservoir, which normally fills by the end of June, Hall said. July is expected to bring another 400-700 kaf in runoff depending on inflows and spring temperatures – roughly 1 maf in addition to the 2 maf of available space. That 1 maf will need to be discharged over the next 60-75 days, which is equivalent to about 6.7 kcfs in daily discharges throughout the refill period. It's not a given that the project will operate above powerhouse for the entire season.

The Walla Walla district has been coordinating with Dworshak hatchery, which would prefer to minimize gas effects from this point forward. Therefore an operational objective is to limit Dworshak discharges to 12 kcfs, the level at which the hatchery can strip gas down to 100%. Beyond that concern, Hall said, the COE is well positioned to provide volume for spring flow augmentation. This kind of flexibility was one objective of the deviation request the district made.

Beginning at 1 pm today, the COE will operate Dworshak with 12 kcfs flows, or full powerhouse plus 2 kcfs spill, until Lower Granite flows exceed 120 kcfs, assuming there are no objections from the Nez Perce Tribe. Barton will consult with them after today's meeting. The Corps will be mindful of monitoring the volume to refill the project, as well.

9. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3,484.95 feet, with 10.5 kcfs discharges including 2 kcfs spill. Beginning tomorrow, spill will stop and total discharge will increase be 10 kcfs through the power plant when the fourth unit comes back on line. The end of April flood control elevation is 3,479.5 feet. Snow pack is 154% of normal in the Flathead basin.

Grand Coulee is at elevation 1,230.0 feet, targeting 1,220.2 feet by the end of April. Overdrafting in 2008 during plentiful flow conditions caused problems for the Hanford operation and serious concerns about flows in the upper and lower Columbia, Wagner recalled. In an attempt to avoid that scenario this year, FPAC recommends maintaining discharges of 135 kcfs at Priest Rapids as a weekly target. John Roache, BOR, said he will relay this request to the Colville Tribe, whose ferry requires a minimum elevation of 1,228 feet.

Libby is at elevation, 2,358.03 feet, awaiting refill. Inflows are 5.4 kcfs and daily average discharges are 8.5 kcfs. Albeni Falls is at elevation 2,055.5 feet,

with inflows of 35.9 kcfs and discharges of 38.2 kcfs. Dworshak is at elevation 1,455.4 feet, with inflows of 9.6 kcfs and daily average discharges of 4.9 kcfs.

Lower Granite is releasing outflows of 104.8 kcfs, with a prior week average of 195 kcfs. Priest Rapids is releasing 136.7 kcfs, with a prior week average of 154.9 kcfs. McNary is releasing 252.7 kcfs, with a prior week average of 262.8 kcfs. Bonneville's discharge was 286.2 kcfs yesterday. The prior week average was 281.7 kcfs.

b. Fish. Adults: There are several indications that the adult migration is delayed this year in response to cooler conditions than normal, Cindy Lefleur, Washington, reported. The most recent year with similar conditions was 2006, when migration didn't pick up until the beginning of May.

Juveniles: Yearling Chinook passage at Lower Granite is above average in comparison to the 10-year cumulative passage index, Wagner said. Migration of wild fish has been steadily increasing since April 6.

c. Power. There was nothing to report today.

d. Water Quality. Scott English, COE, reported that all gauges are operating and there are no exceedances.

7. Next Meeting

There will be a conference call on Friday, April 22 to discuss the final disposition of SOR 2011-02 regarding uniform spill at Lower Monumental. Next week's regular TMT meeting will be a conference call on April 27.

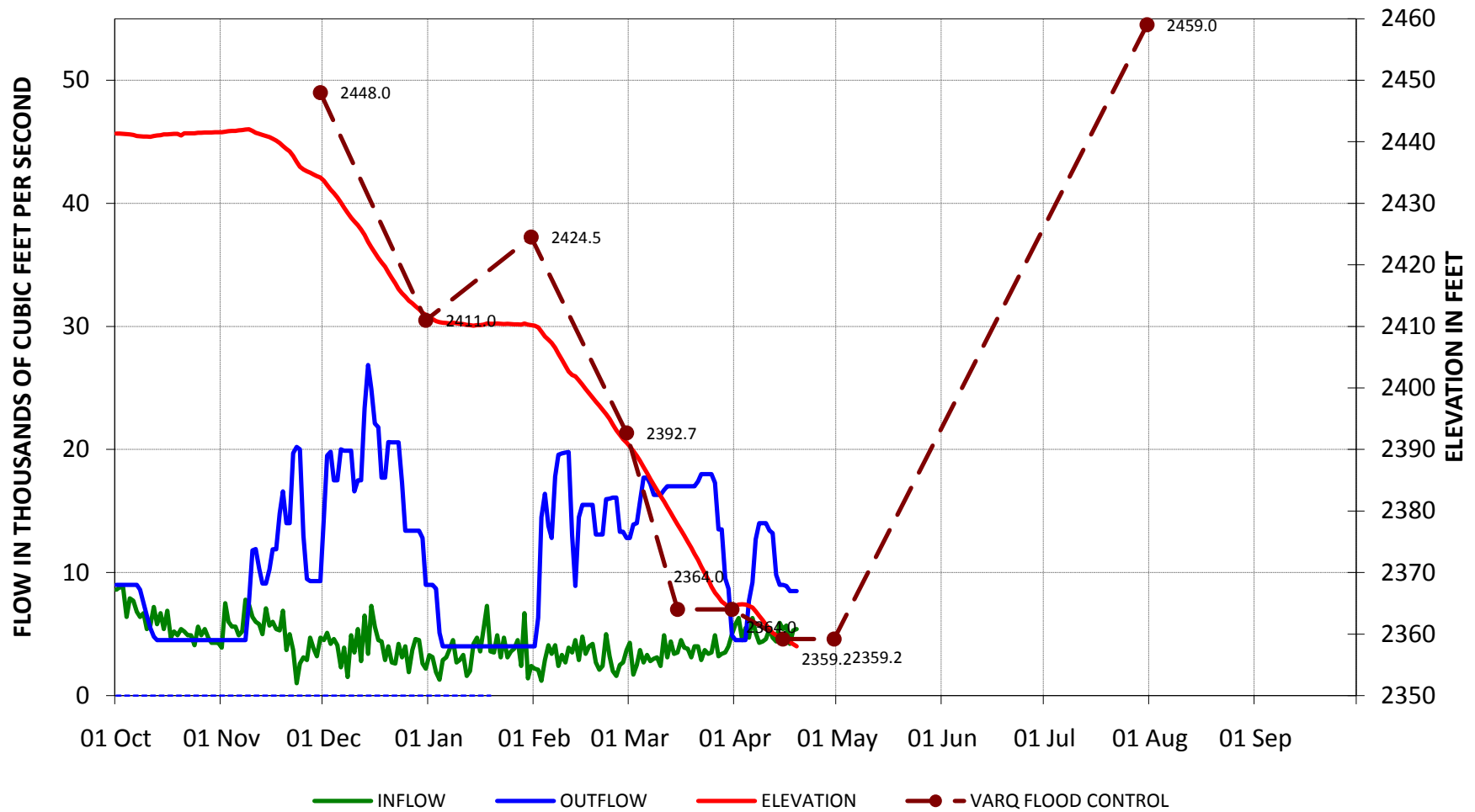
Name	Affiliation
Paul Wagner	NOAA
Cindy Lefleur	Washington
Dave Wills	USFWS
Rick Kruger	Oregon
Steve Barton	COE
John Roache	BOR
Tony Norris	BPA
Russ Kiefer	Idaho
Scott English	COE
Scott Bettin	BPA
Steve Hall	COE Walla Walla
Dan Feil	COE
Laura Hamilton	COE
Karl Kanbergs	COE
Tom Lorz	CRITFC

Phone:

Dave Benner	FPC
Russ George	WMC
Tim Heizenrader	Centaurus
Margaret Filardo	FPC
Barry Espenson	CBB
Ruth Burris	PGE
Ron Frank	Colorado Energy
Richelle Beck	DRA
Tom Le	Puget Sound Energy
Doug Vine	Thompson Reutters
Shane Scott	PPC
Russell Langshaw	Grant PUD

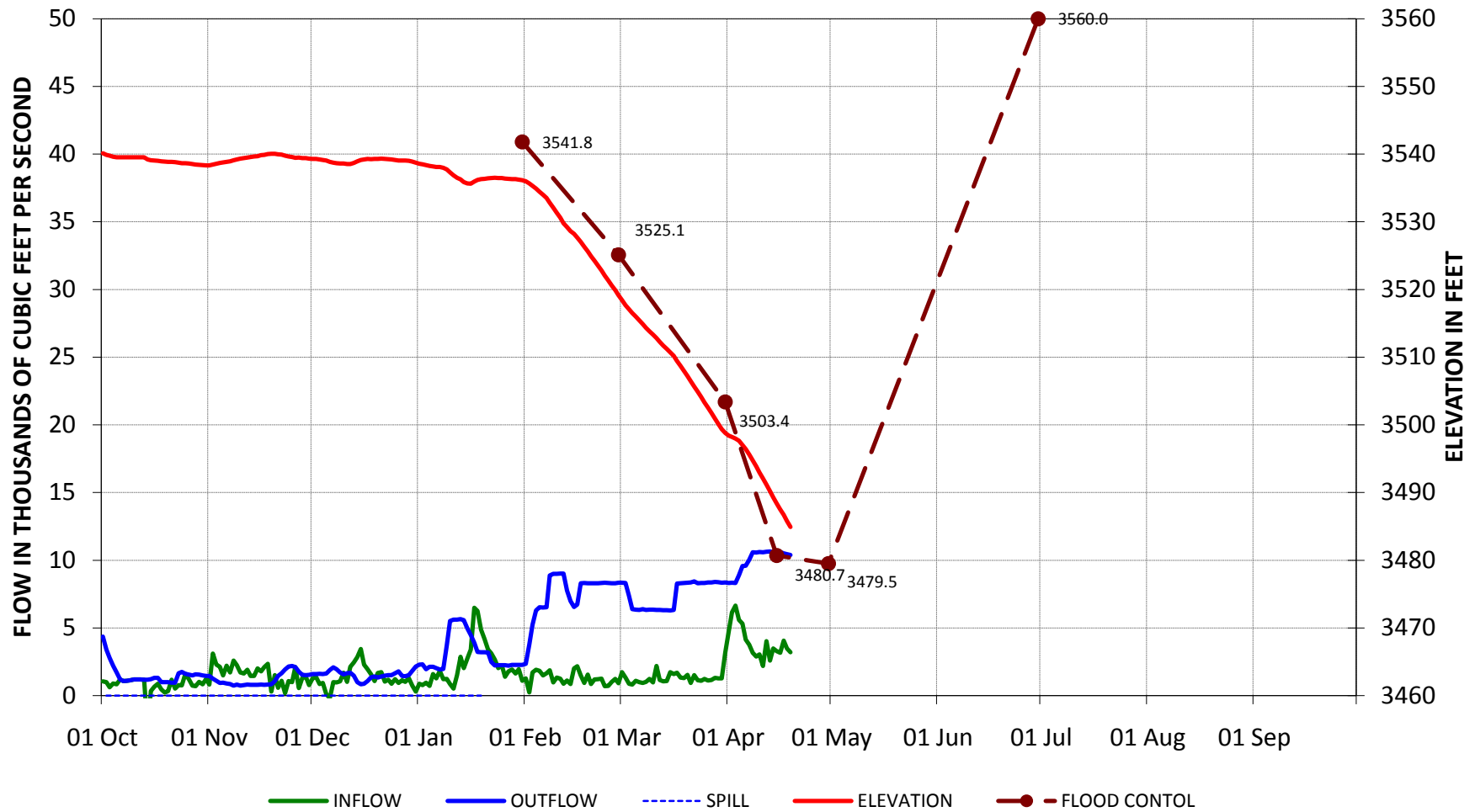
LIBBY DAM AND RESERVOIR

Water Year 2011



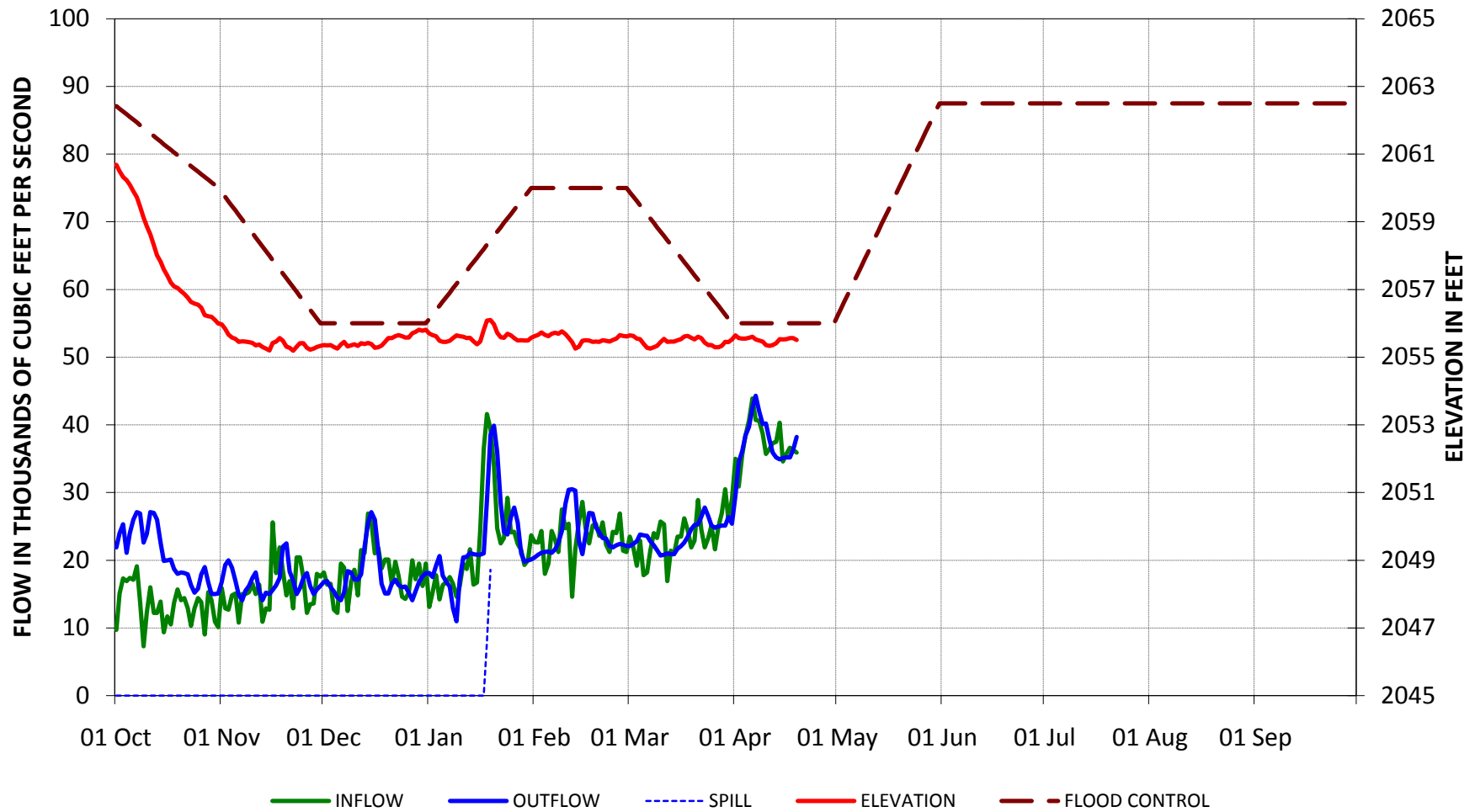
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



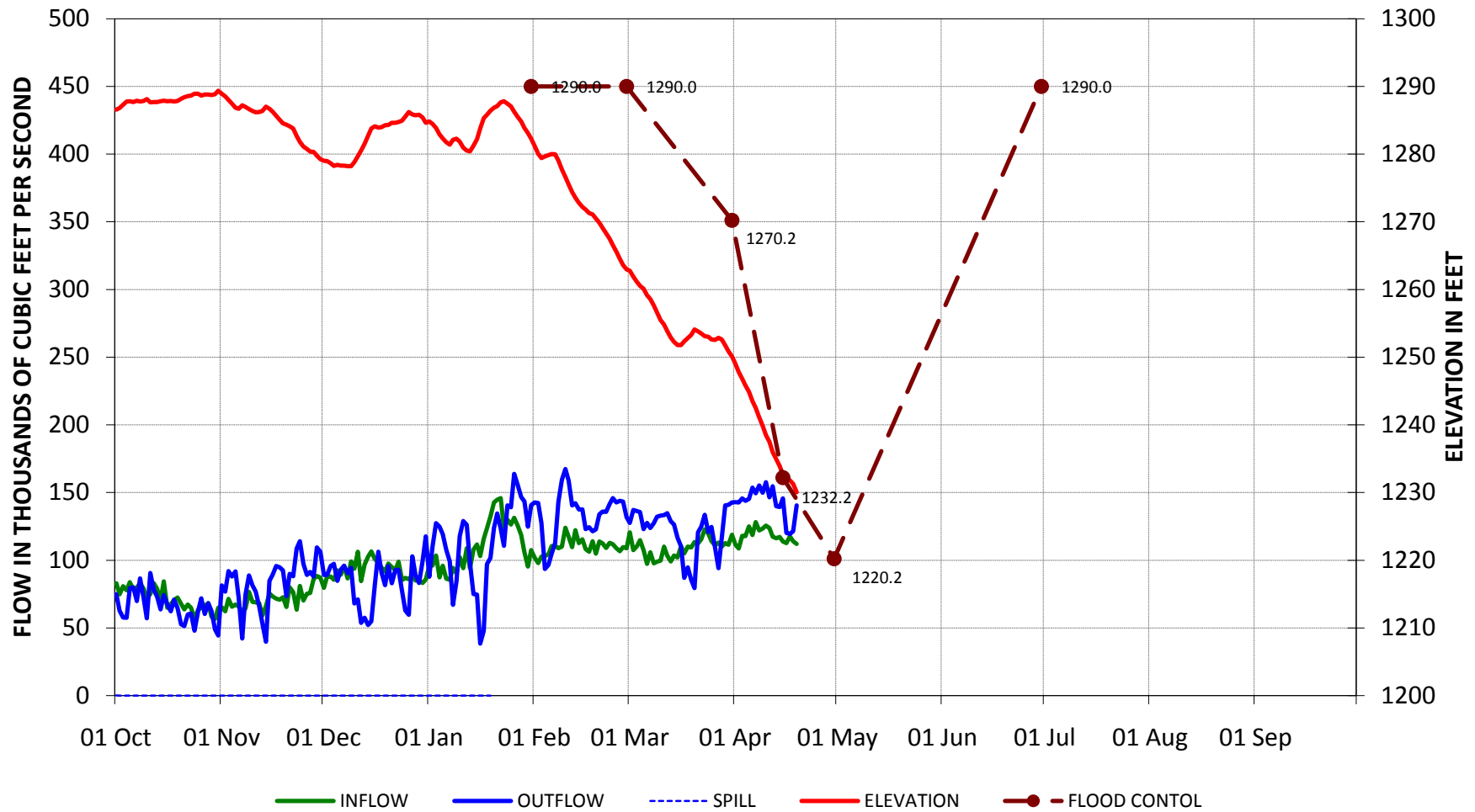
ALBENI FALLS DAM AND RESERVOIR

Water Year 2011



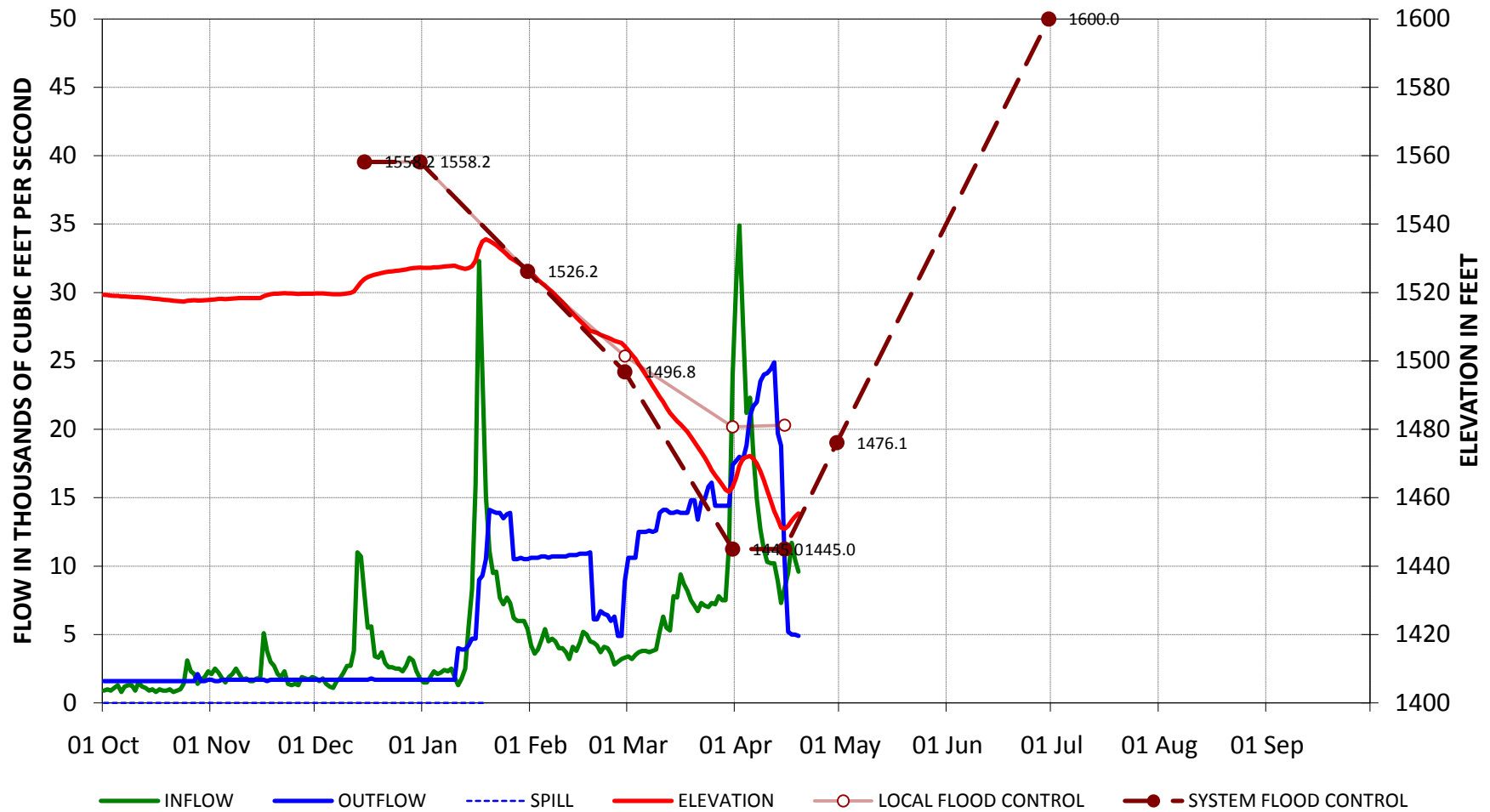
GRAND COULEE DAM AND RESERVOIR

Water Year 2011

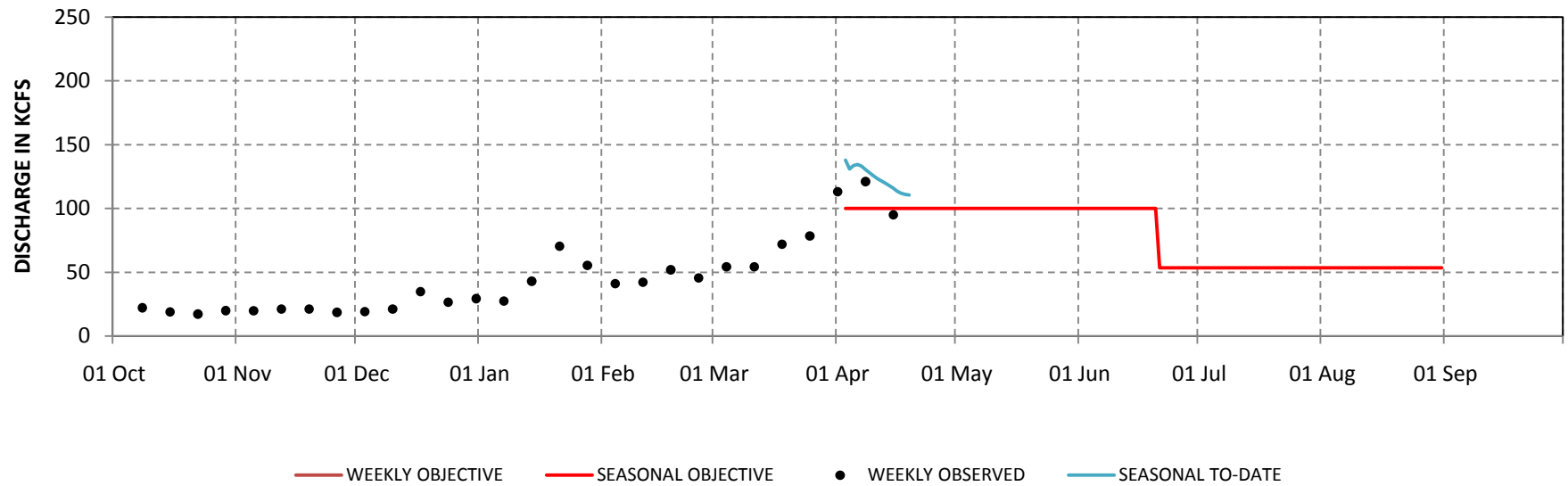


DWORSHAK DAM AND RESERVOIR

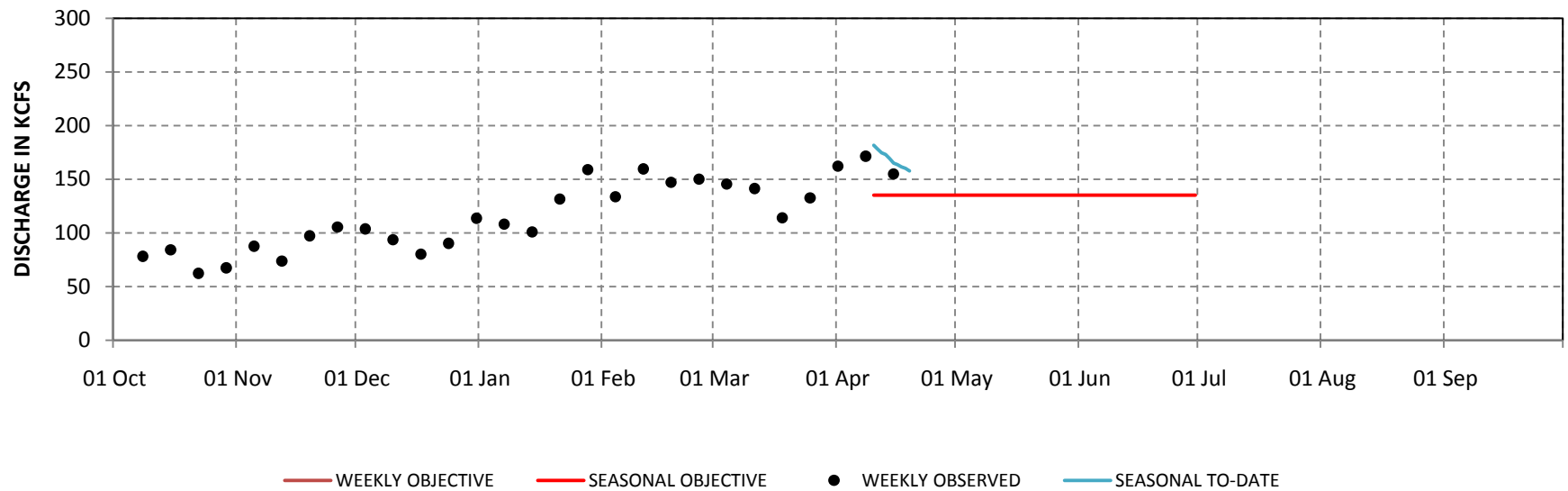
Water Year 2011



PROJECT DISCHARGE SUMMARY SNAKE RIVER AT LOWER GRANITE DAM

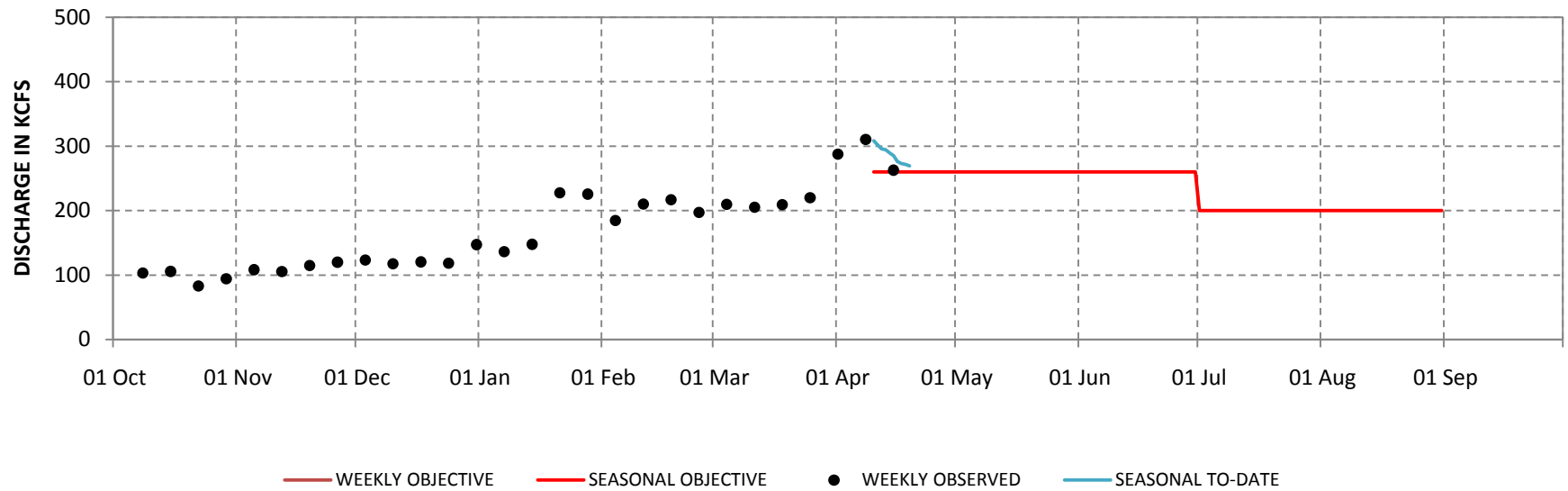


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM

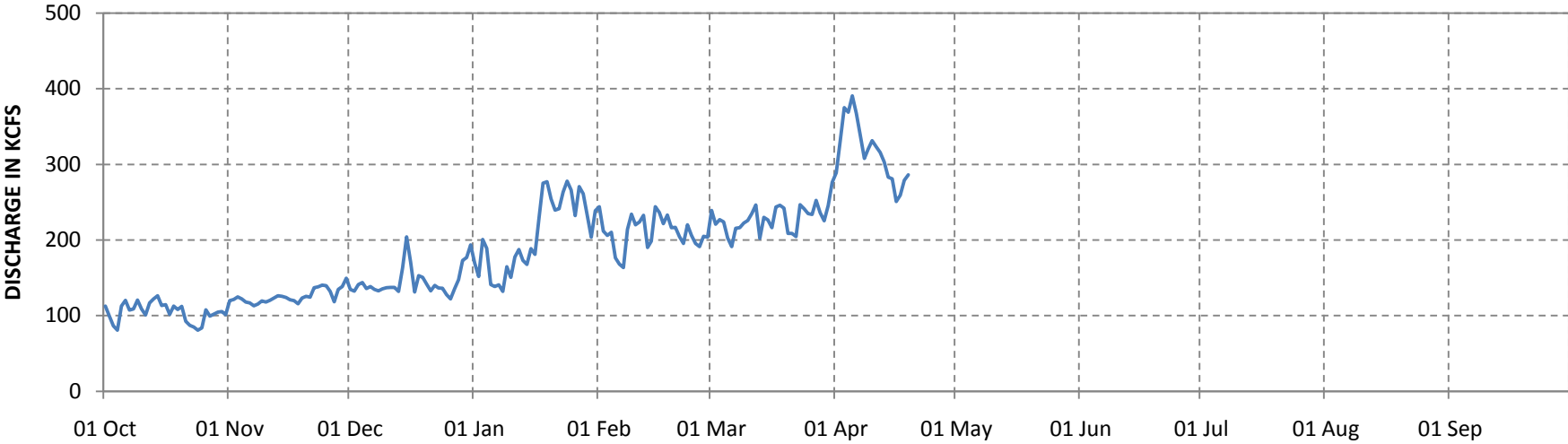


PROJECT DISCHARGE SUMMARY

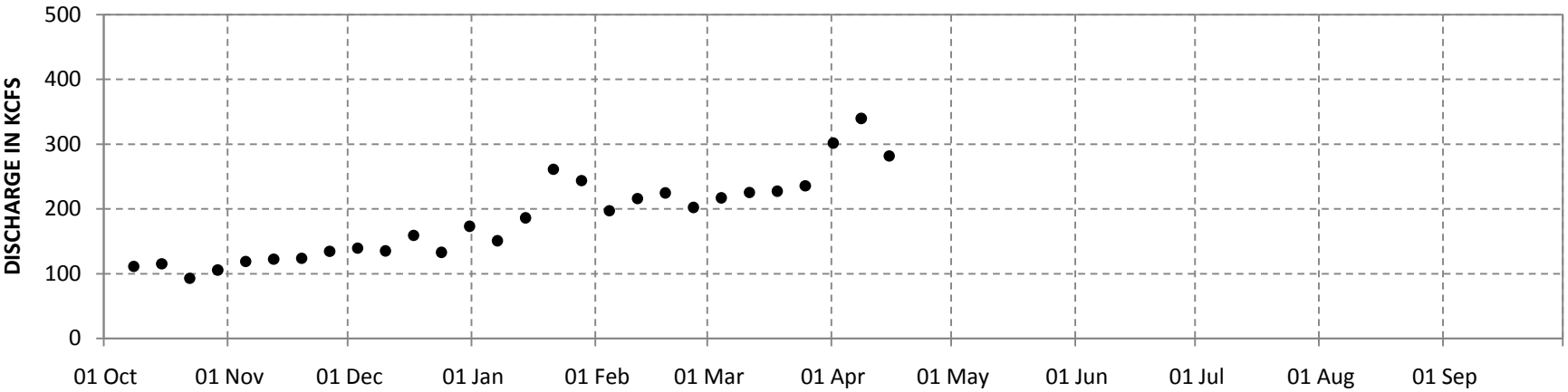
COLUMBIA RIVER AT McNARY DAM



PROJECT DISCHARGE SUMMARY
COLUMBIA RIVER AT BONNEVILLE DAM

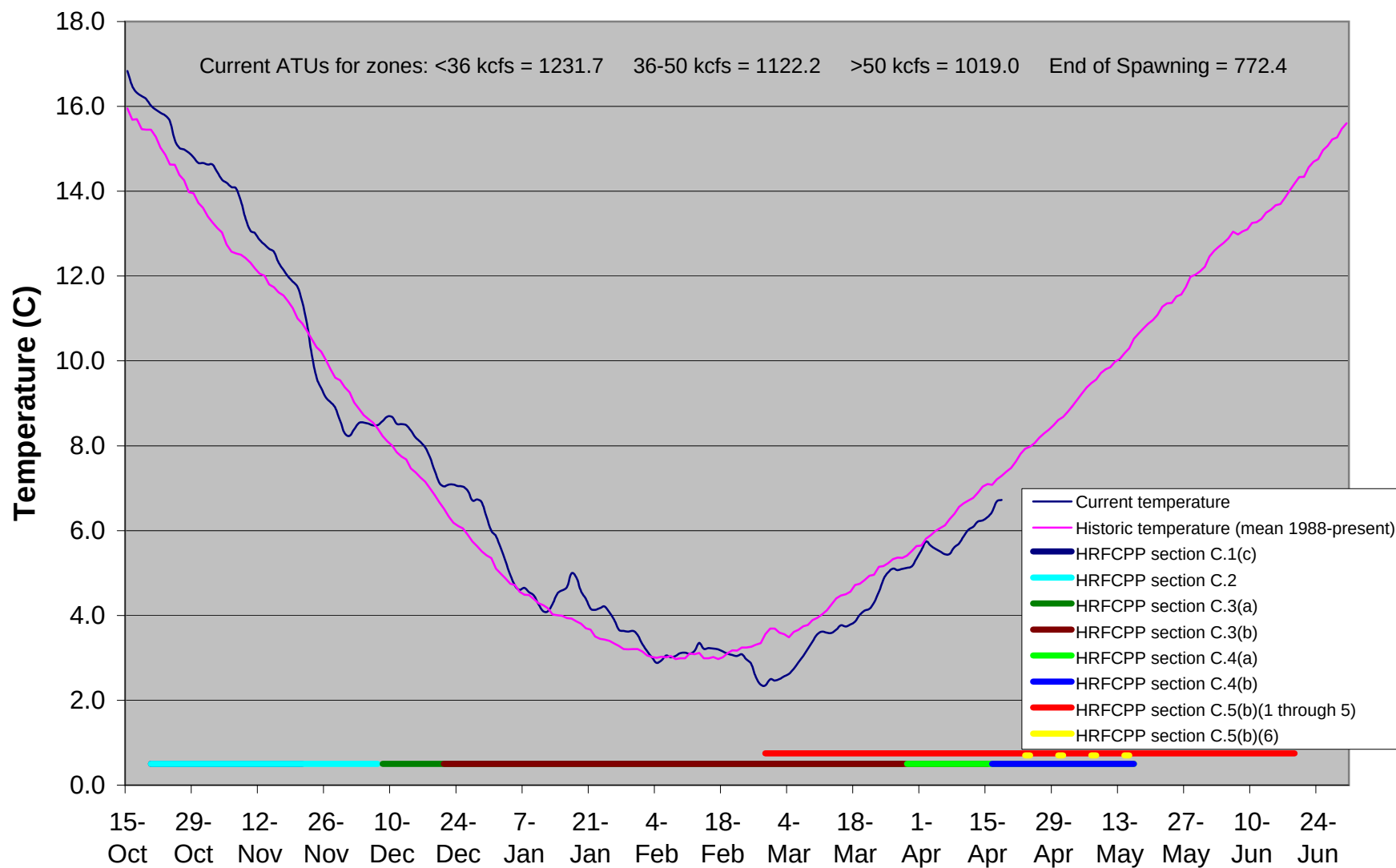


— OUTFLOW — SEASONAL OBJECTIVE



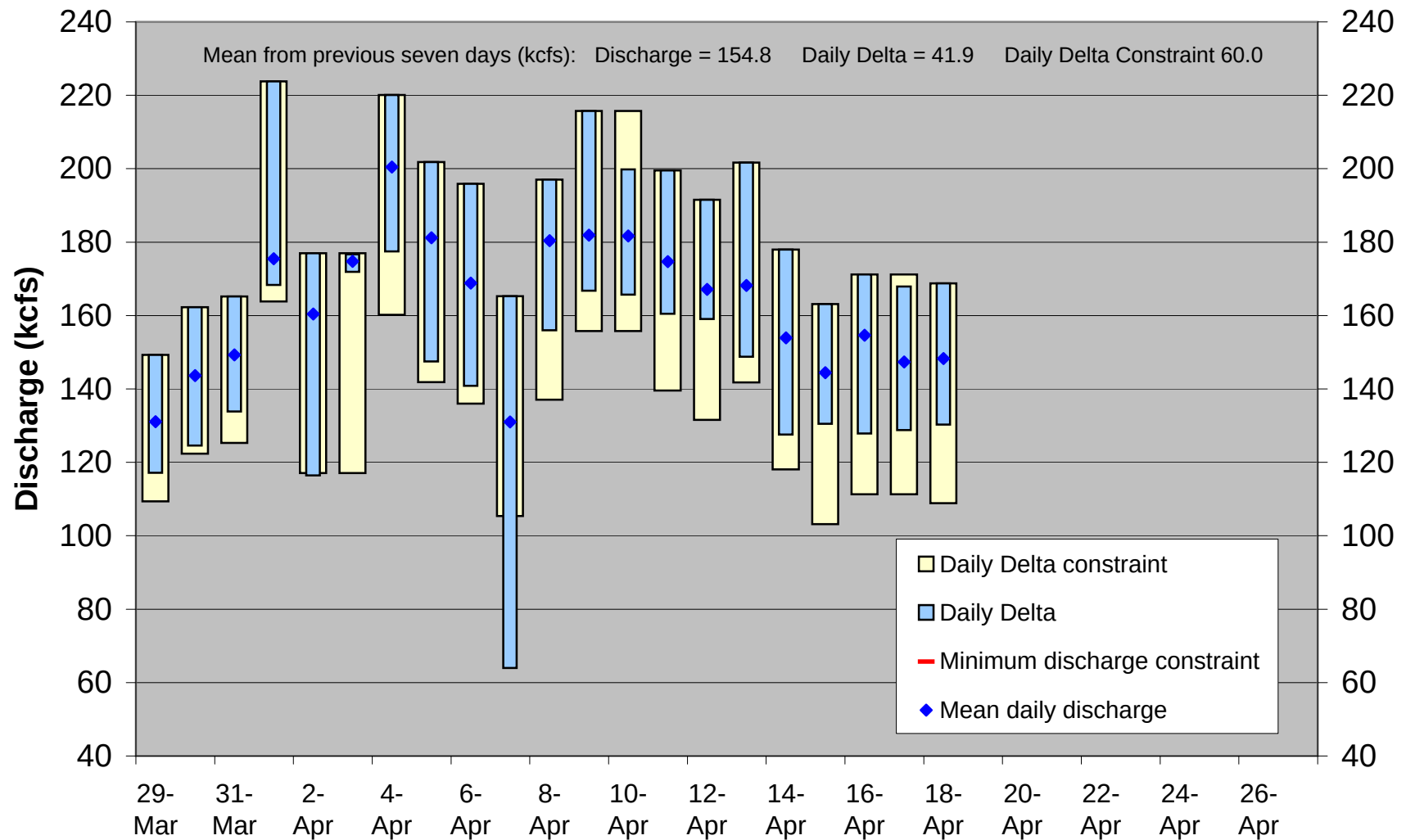
— WEEKLY OBJECTIVE — SEASONAL OBJECTIVE ● WEEKLY OBSERVED — SEASONAL TO-DATE

2010-2011 PRD Tailrace Temperatures and HRF CPP constraints

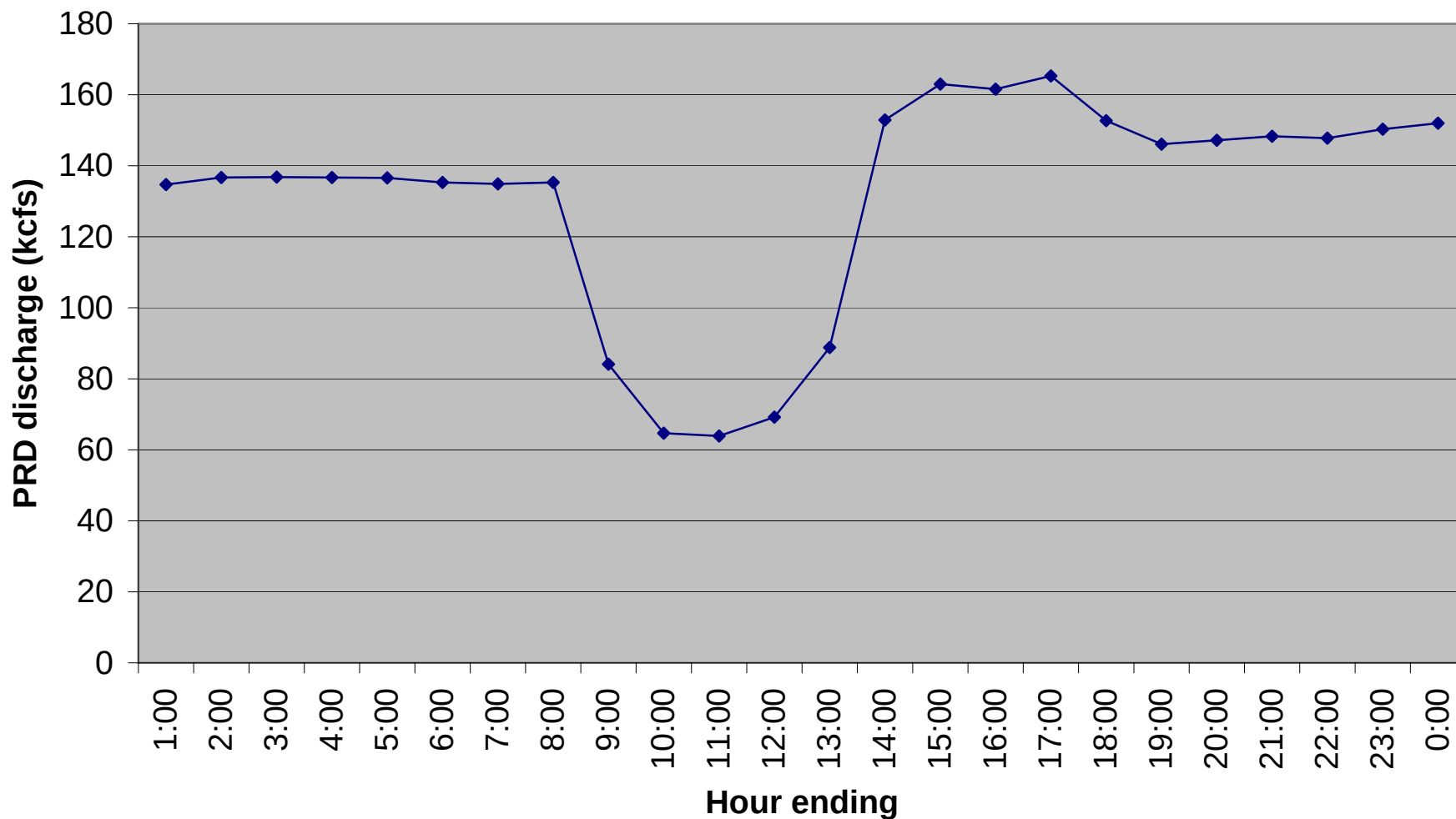


Priest Rapids Dam Operations 2011

Number of exceedances: 2



Priest Rapids Dam discharge during 4/7/11
Exceedance to support egg-to-fry survival study



TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Friday April 22, 2011 11:00am - 12:00am

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

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*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. SOR 2011-02 - Lower Monumental Spill Pattern - Steve Barton, COE-NWD and Paul Wagner, NOAA-F
 - a. [SOR 2011-02](#)
3. Other
 - a. next meeting - **April 20, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 22, 2011
Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

SOR 2011-02 re: Lower Monumental Spill Pattern

As follow up from the 4/20 TMT meeting, the team revisited the salmon managers' request to change to a uniform spill pattern at Lower Monumental when flows are above 100 kcfs. Steve Barton, COE, said the COE had reviewed all the information and perspectives shared over the last two TMT discussions on this issue and said the COE was not compelled to make a change to the Fish Operations Plan guidance to use a bulk spill pattern at Lower Monumental. He added that the COE would move to uniform spill if involuntary spill occurs in the system – meaning full load spill/ lack of load spill conditions – similar to what was provided in June of 2010. He added that if the project moved to uniform spill, it would likely remain as such for a period of days or weeks.

The COE used the dam passage survival data from the 2008-09 study that resulted in the determination to use a bulk pattern. Steve reported that one of the two Lower Granite turbines would be back on line next week (sooner than expected) [Note; after additional calls from the project, this early return to service announcement was retracted. No additional units are expected to return earlier than May] and the other would be up at the end of May. The COE does not feel the difference in TDG impacts from using a bulk vs. uniform spill at Lower Monumental would be significant at the current lower flows.

- o Russ Kiefer, Idaho, expressed frustration and disappointment that given regional salmon manager consensus on the issue, and additional SAR data indicating life cycle survival improvements would occur with a uniform spill pattern given the high flows, the COE was not compelled to grant the request. He pointed to 2006 data concerning bypassed fish at Lower Monumental. He questioned the process for data review and expressed concern that the salmon managers were not consulted with further re: their biological rationale for recommending the operation.
- o Paul Wagner, NOAA, said when he signed on to the SOR, flows were very high and the proposed operation looked like an easy solution for managing TDG. That said, conditions have changed and flows are below what was expected. While

NOAA is interested in investigating the issue further at FPOM with the potential for making changes next year, NOAA was not opposed to the COE's decision for the near term operation.

- o Tony Norris, BPA, said BPA supports the COE's disposition on this issue.
- o John Roache, BOR, said Reclamation also supports the COE's disposition.
- o Jim Litchfield, Montana, said Montana does not object to the COE's disposition.
- o Rick Kruger, Oregon, said he, like Russ Kiefer, was disappointed in the COE's narrow focus on limited data to make this decision. He also noted that all the salmon managers had signed on to the SOR and he did not understand the COE's reasoning for going against the request. He requested that this issue be elevated to the RIOG for further deliberation and decision.
- o USFWS and CTUIR, both signatories to the SOR, were not present on the call.

Next Steps/Action:

- o The facilitator will work with TMT to frame the policy question for RIOG.
- o RIOG meets on 4/27 at 1:00 pm and this item will be added to the agenda.
- o TMT members will brief their RIOG representatives on the issue before the 4/27 meeting.
- o Notes from the TMT meetings will be distributed to TMT members on 4/25 to remind them of the overview of discussions around this issue.
- o There will be a report out on this item at the next TMT meeting.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 22, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, BPA, Idaho, NOAA, BOR, Oregon, Montana and others attended. USFWS, Washington, CRITFC and Tribal representatives were not present on the call. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. SOR 2011-2, Lower Monumental Spill Patterns

The purpose of today's TMT call was disposition of SOR 2011-02 submitted by the Salmon Managers on April 13 to address TDG concerns at high flows by switching Lower Monumental operations from bulk to uniform spill. TMT discussed this request at length on April 13 and again on April 20, when the COE scheduled today's call to announce a decision.

After reviewing available data in search of biological evidence to support departure from the spring 2011 FOP, the COE has not identified a compelling reason to switch from the bulk to uniform spill pattern at Lower Monumental, Barton said. However, the COE will switch to the uniform pattern under involuntary spill conditions, as in past years. For example, in June 2010, the river system was at full load on all available units, with involuntary spill due to lack of turbine capacity. This spring could bring similar involuntary spill conditions due to lack of turbine capacity and lack of load as well. The COE will switch to uniform spill when conditions are such that it will be needed for several days or possibly weeks at a time.

Margaret Filardo, FPC, asked about the qualitative criteria for compelling biological evidence. Barton defined "compelling" as a significant difference, whereas data from a 2009 paired-release study show virtually no difference in dam passage survival rates between bulk and uniform spill. These are the same data that led to a choice of bulk spill in the FPP. The COE has seen no other data to take into consideration at this point. During the course of the 2009 paired-release study, flows at Lower Monumental ranged from 31-172 kcfs, Dan Feil, COE, said. River flows at present are just over 100 kcfs, with 30 kcfs spill at Lower Monumental, which is above average for the bulk pattern used during the 2009 study. The two units out at Lower Granite are expected back on line soon, one next week and the other on May 13.

The gas production phenomenon between Lower Granite and Lower Monumental happens only under certain conditions, Barton explained. At current flows, with Lower Granite spilling approximately 50 kcfs and the tailwater below 120% TDG, a unit outage tends to trigger TDG impacts at Lower Monumental. However, when one unit comes back on line next week [after the meeting new information from the project indicated the unit would not come back until some time in May], the gas cap at Lower Granite should rise to around 140 kcfs. At that point Lower Monumental would be spilling involuntarily.

TMT members stated their views of the disposition of SOR-2011-02:

- **Idaho** – Using the bulk spill pattern means passing an estimated 5-10% more wild yearling Chinook through the bypass than using uniform spill, which is not good in terms of meeting life-cycle goals. With two turbines out at Lower Granite, using the bulk spill pattern means having to cut back on spill at Lower Monumental due to TDG constraints and run more fish through the bypass. Spilling or transporting fish has been shown to produce higher smolt-to-adult return rates than bypassing them. The most recent year for which complete adult return data is available is 2006, when SARs for wild Chinook were 0.76% for transported fish, 0.97% for spillway-passed fish, and 0.36% for bypassed fish. SARs for steelhead were 1.31% for transported fish, 1.54% for spillway-passed fish, and 0.60% for bypassed fish. This year, survival rates will be well above 53%, the cutoff point beyond which transport has been shown to provide little benefit. These findings together provide a compelling reason to switch to the uniform spill pattern at Lower Monumental.
- **NOAA** – Supported the SOR more strongly when flows at Lower Granite were in the 120-150 kcfs range and producing excessive TDG, while Lower Monumental ramped back on spill to regulate gas downriver. Initial support for the SOR was for the purpose of taking pressure off Lower Monumental. Now that flows are well below excess generation, implementing the SOR is not so urgent. More information is coming soon on this issue, including findings from the recent ERDC modeling trip and the upcoming delayed mortality workshop. This issue should be revisited soon – by no later than next year.
- **BPA** – Supports the COE decision.
- **BOR** – Supports the COE decision.
- **COE** – New information on this issue needs to be fully vetted by the region via FPOM. Encouraged the Salmon Managers to continue this conversation at FPOM and to work toward regional consensus on interpretation of the new data.

- **Montana** – No objection.
- **Oregon** – Elevate it to RIOG.

This is the first time since RIOG was formed that TMT has elevated an issue for policy review. Feil and Gumpert urged TMT members to inform their RIOG representatives thoroughly of the technical nuances behind this SOR. Gumpert offered to help TMT members frame the policy question being asked of RIOG and to take the lead in preparing a half-page issue summary using the template RIOG provided.

Bulk vs. uniform spill at Lower Monumental will be added to the agenda for the next RIOG meeting on the afternoon of April 27.

7. Next Meeting

The next regular TMT meeting will be a conference call on April 27.

<i>Name</i>	<i>Affiliation</i>
Tony Norris	BPA
Nick Lane	BPA
Russ Kiefer	Idaho
Paul Wagner	NOAA
John Roache	BOR
Steve Barton	COE
Doug Baus	COE
Dan Feil	COE
Laura Hamilton	COE
Dan Spear	BPA
Dave Benner	FPC
Margaret Filardo	FPC
Richelle Beck	DRA
Shane Scott	PPC
Rick Kruger	Oregon
Paul Wagner	NOAA
Jim Litchfield	Montana
Scott Bettin	BPA
Jason Sweet	BPA

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
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Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday April 27, 2011 9:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

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Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Dworshak Update - Steve Barton, COE-NWD and Steve Hall, COE-NWW
3. Lower Monumental Involuntary Spill - Steve Barton, COE-NWD
4. Initiation of Juvenile Transportation - Doug Baus, COE-NWD
5. Spring Creek Operation - Dave Wills, USFWS
6. Priest Rapids Flow Target - Steve Barton, COE-NWD
7. Other
 - a. Set agenda and date for next meeting - **May 4, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

**COLUMBIA RIVER REGIONAL FORUM TECHNICAL MANAGEMENT
TEAM**

April 27, 2011 Conference Call
FACILITATOR'S SUMMARY NOTES
Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Dworshak Operations Update

Steve Barton, COE, reported that, per the salmon manager recommendations and agreement reached at the 4/20 TMT meeting, the COE had increased outflows from Dworshak to full powerhouse + 2 kcfs spill to help increase inflows at Lower Granite. The project was currently at elevation 1451.5' with inflows around 10.8 kcfs. Steve Hall, Walla Walla District COE, shared that the project would reach a constraint if drafted to elevation 1449' – this would require the project to disconnect the docks on the upstream face of the project as the connector cables would be exposed at that elevation and at risk for damage. The COE would continue the current operation but wanted everyone to be aware of this potential constraint; the COE will need to back off to passing inflows if the project reaches elevation 1450' and until the reservoir comes back up. Steve said the change could happen as soon as the upcoming weekend.

Dave Statler, Nez Perce Tribe, asked about the target elevation at Dworshak. Steve Hall said the end of April target is 1471' but will be well below that elevation. That said, the COE is confident that with the existing and accumulating snow pack, refilling the project will not be a problem even if while implementing the current operation. The COE will continue to monitor the project and conditions closely and make necessary adjustments as needed to meet all requirements. Steve also said the current operation would not delay the timing for refill.

SAR Data Update

Russ Kiefer, Idaho, shared corrected SAR data he had reported on during the 4/22 TMT conference call: CSS estimates for wild Snake River steelhead from the migratory year 2006 were as follows: Transported – 1.31; uncollected spillway and turbine – 1.54; and bypassed – 0.60. This correction will be made to the 4/22 Official Meeting Minutes as well.

Lower Monumental Involuntary Spill

Steve Barton, COE, brought this issue to TMT to close an administrative loop from last week's TMT discussions on SOR 2011-02 re: spill patterns at Lower Monumental. While the COE's decision not to implement the SOR had been elevated by Oregon and would be further discussed at the RIOG and Senior Hydro Teams later this week, Steve wanted to poll TMT members on their level of support for implementing a uniform spill pattern during involuntary spill – either when the system is at full load or lack of load causing involuntary spill. This would be a change to the current Fish Operations Plan and

therefore needed to be regionally coordinated and described in a memo submitted to the court. The change would be for this year only, at this point.

Consensus: All TMT members present were supportive or did not object to the COE's proposal: *Oregon, Washington, Idaho, Montana, Nez Perce, CTUIR, Colville Tribe, USFWS, NOAA, BPA, BOR.*

Action/Next Steps: The COE will email the proposed operation to all sovereigns to provide one last opportunity for comment. With no objections, language will be submitted to the court to the effect that during times of involuntary spill including lack of load or lack of turbine, Lower Monumental will switch to a uniform spill pattern. Actual operations will be coordinated between the COE, the project and BPA. Steve noted that any change in spill pattern would be for a period of days rather than hours. He also said given the near term forecasts, this change was not likely occur over the next 10-day period.

Rick Kruger, Oregon, provided an update on the dispute resolution process for addressing SOR 2011-02. The RIOG was scheduled to meet at 1:00 pm today (4/27) and this item had been added to the agenda. The likely next step will be for the Senior Hydro Team to develop a briefing paper to frame up a policy question for sending back to the RIOG. The Hydro Team chair, NOAA's Ritchie Graves, was working to convene that meeting on Thursday, 4/28, at 1:00 pm. Rick said this meeting was not open to the public.

Action: Robin Gumpert, Facilitator, will send the RIOG Hydro Dispute Resolution Procedures and Point of Contact List to TMT members so they can get up to speed on the process and connect with their Senior Hydro Team representatives prior to Thursday. TMT will follow up on this issue at their next TMT meeting.

Initiation of Juvenile Transportation

Doug Baus, COE, reported that, with no objections nor alternative recommendations from the salmon managers, the COE planned to begin transportation on May 1 consistent with the FOP to begin such operations 'no later than May 1'. Lower Granite will begin collection at 0700 on 5/1, with transportation beginning on 5/2; collection will begin at Little Goose on 5/5 with transport on 5/6; and collection at Lower Monumental will begin on 5/8 with transport on 5/9.

Spring Creek Hatchery Release

Dave Wills, USFWS, reported that the second and final Spring Creek hatchery release was scheduled for 5/4. Given the high flows and observations from the first release, Bonneville was requested to switch to the lower end of 1% turbine efficiency at 6:00 pm on 5/4 to accommodate safe passage of the arriving fish. This would continue for four days until the bulk of the fish had passed. At that time, the project will check passage numbers to determine whether to end the constraint. Doug Baus, COE, said the COE planned to coordinate and implement the request as described. Dave Wills will report on the outcome of the release and operation at the next TMT meeting.

Priest Rapids Flow Target

John Roache, Reclamation, said he heard the request last week from the salmon managers to maintain 135 kcfs Priest Rapids flow targets beyond April when Grand Coulee will cease drafting and begin refill. With the flows and warming temperatures forecasted, John said he thought this was a reasonable request. He asked for feedback from TMT members:

- o NOAA – Appreciate Reclamation’s responsiveness; supportive of the plan
- o USFWS – Supports the plan
- o Oregon – Supports the plan
- o Washington – Supports the plan
- o Montana – Supports the plan
- o Idaho – Supports the plan
- o CTUIR – Supports the plan
- o Nez Perce – Supports the plan
- o Colville – Concern for ferries remaining out of service as a hardship to many locals – hope to get the levels up enough to run the ferry as soon as possible. No objection at this point.
- o COE – Support the plan
- o BPA – Concur with the plan

Next TMT Meeting, May 11, 9:00 am Conference Call

Agenda Items include:

- o Follow up on SOR 2011-02 dispute resolution process
- o Dworshak Operations Update
- o Transportation Operations
- o Spring Creek Hatchery Release Report
- o Vernita Bar Update
- o Operations Review
- o Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 27, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, NOAA, Oregon, Washington the Nez Perce Tribe, Idaho, Montana, BPA, USFWS Colville Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

Russ Kiefer, Idaho, reported that the SARs estimates he'd quoted incorrect numbers for wild Snake River steelhead during Friday's conference call regarding SOR 2011-02, uniform spill at Lower Monumental. The corrected SARs from the CSS report are: 1.31% for transported fish, 1.54% for spillway- or turbine-passed fish, and 0.60% for bypassed fish.

2. Dworshak Operations Update

Last week discharges were increased from Dworshak to augment flows into Lower Granite, which were 95.5 kcfs yesterday, Barton reported. Dworshak forebay, currently at elevation 1,451.5 feet, was continuing to discharge full powerhouse at 11.8 kcfs this morning. Inflows have picked up to 10.9 kcfs.

Steve Hall, COE, reported on the near-term outlook for this operation. Inflows are expected to pick up to 12 kcfs from where they currently hover between 8-11 kcfs. The reservoir elevation is close to 1,449 feet, at which point the COE has to disconnect the cables from the docks on the upstream face of the dam to prevent damage. The problem could arise as soon as this coming weekend. If the elevation drops to 1,449 feet, the COE will ramp down outflows by 1-2 kcfs so that the project is passing inflows. However, that will not be necessary if the forecasted precipitation and temperature increases boost inflows and forebay elevation. The COE will track this situation closely. At present, there appears to be plenty of water available in the form of snow pack to refill the reservoir while continuing to release a few cfs during the refill operation.

Russ Kiefer, **Idaho**, and Paul Wagner, **NOAA**, voiced no objections to that operation. Dave Statler, **Nez Perce Tribe**, asked whether earlier discharges will result in Dworshak refilling later. No, Hall replied, the reservoir will refill more rapidly. When inflows drop below powerhouse capacity, the COE will manage outflows to top off the reservoir. A drop in inflows below powerhouse capacity has long been considered the trigger for topping off the reservoir. TMT will revisit this issue at its next meeting on May 11.

3. Lower Monumental Involuntary Spill

With SOR 2011-02 being elevated to RIOG this afternoon, Barton asked TMT to consider the COE's proposed spill pattern for managing gas levels from involuntary spill at Lower Monumental this year. Last year, the operation switched to a uniform pattern during involuntary spill conditions to minimize TDG.

The COE's proposal this year differs from the 2011 spring FOP in that it applies to involuntary spill in general, whether from lack of load or lack of turbine capacity. Therefore, a poll is required and the court must be notified of the change. The poll was limited to involuntary spill for this year only:

- **NOAA** – No objection to the proposed operation
- **Washington** – No objection
- **USFWS** – No objection
- **Oregon** – No objection
- **Idaho** – Supports the operation
- **Montana** – Supports the operation
- **Colville Tribe** – Supports the operation
- **Nez Perce Tribe** – No objection
- **BPA** – No objection
- **BOR** – No objection

The COE will poll any sovereigns not present on today's call and, hearing no objections, issue a teletype to establish protocols for switching to the uniform pattern when conditions due to lack of market or turbine capacity indicate that uniform spill will be needed to control gas at Lower Monumental for at least 3 days. The reason for the 3-day limit is that switching patterns more often puts wear and tear on the spill gates, Barton said. The trigger will be when flows are headed for more than 140 kcfs for a few days. The 10-day forecast doesn't suggest this limit will be reached any time soon.

Rick Kruger, Oregon, urged TMT, particularly the Salmon Managers, to brief their senior hydro technical team representatives for a 1 pm meeting tomorrow. The RIOG dispute resolution process calls for the senior hydro technical team to frame the policy question regarding disposition of SOR-2011-02. Richelle Beck, DRA, asked whether senior hydro technical team meetings are open to the public; they are not. TMT will revisit this issue at its next meeting May 11.

4. Initiation of Juvenile Transportation

Hearing no objections today, the COE plans to move forward on TMT's recommendation at the April 20 meeting to initiate transportation on May 1, Doug Baus reported. This is in accordance with the 2011 spring FOP, which specifies that transport will be initiated at Lower Granite Dam no earlier than April 20 and no later than May 1. Transport 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. There were no objections, so collection for transport at Lower Granite will begin at 7 am May 1.

5. Spring Creek Operation

The first release of the year went quickly and well, thanks to high flows and good coordination, David Wills, USFWS, reported. The same operation at the lower end of 1% turbine efficiency is being requested for the second release of the year, planned for 6 pm on May 4. There were no objections.

6. Priest Rapids Flow Target

Last week on April 20, the Salmon Managers requested that BOR maintain a flow objective of 135 kcfs at Priest Rapids until the initiation of refill, John Roache, BOR, recalled. There was concern that flows would drop off once the drafting of Grand Coulee ends. At the beginning of April, Priest Rapids flows well exceeded 135 kcfs, with Grand Coulee drafting a foot a day to meet its April 30 flood control elevation. At this point, it seems reasonable to keep Priest Rapids at 135 kcfs, especially with temperatures warming. Roache asked whether there were any objections to keeping Priest Rapids at 135 kcfs flows after Grand Coulee stops drafting.

- **COE** – No objection
- **NOAA** – Supports the operation
- **Idaho** – Supports the operation
- **Washington** – No objection
- **Oregon** – Supports the operation
- **Montana** – Supports the operation
- **USFWS** – Supports the operation
- **CRITFC** – Supports the operation
- **Nez Perce Tribe** – Supports the operation
- **Colville Tribe** – No objection, although the loss of ferry service at current flows is causing hardship for tribal members
- **BPA** – Supports the operation

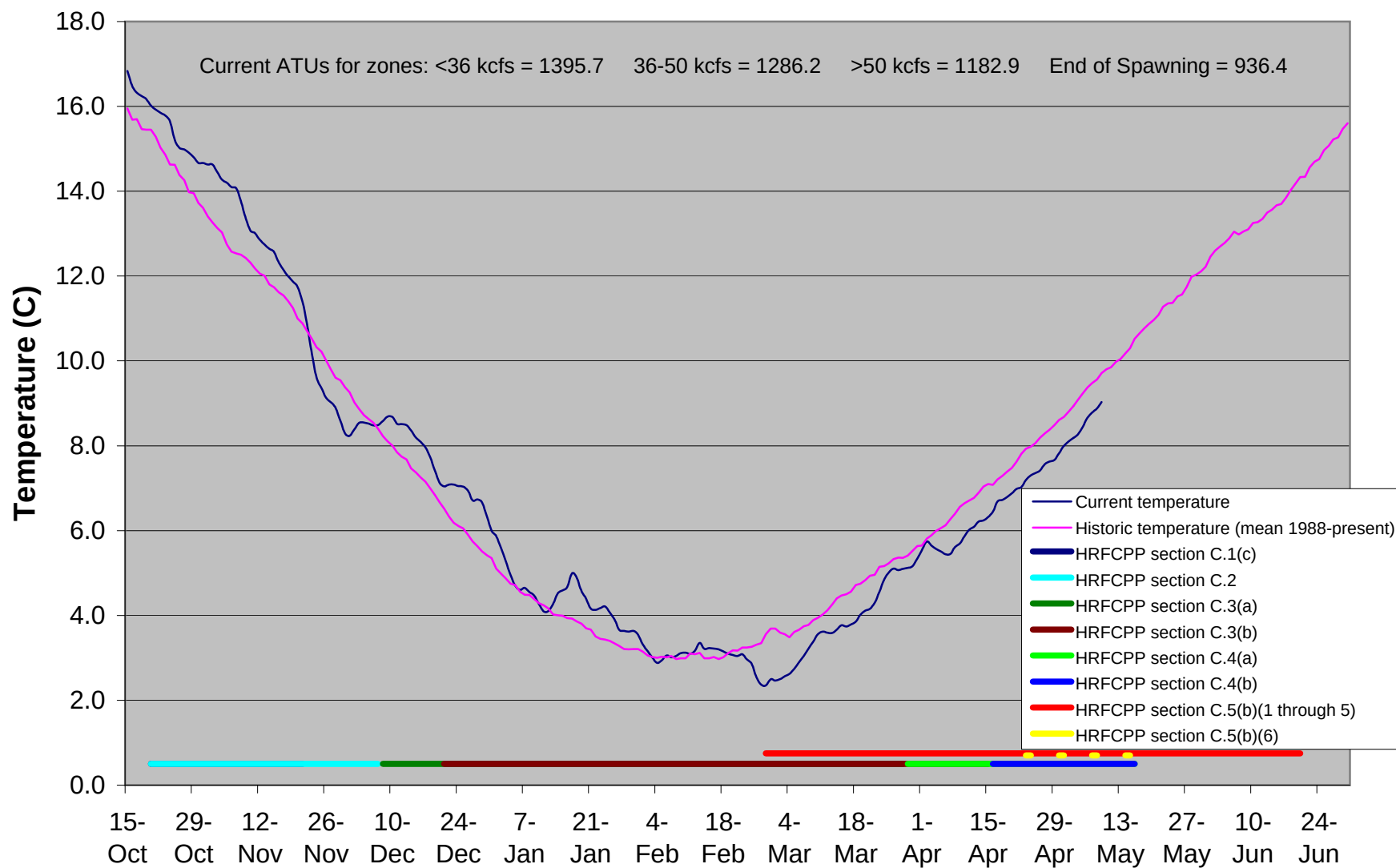
Hearing no objection, the BOR will continue to provide 135 kcfs flows at Priest Rapids while coordinating the operation with the Colville Tribe and other local stakeholders.

7. Next Meeting

The May 4 TMT meeting was canceled due to a schedule conflict with FFDRWG, so the next regular TMT meetings will be on May 11 (meeting or call to be determined based on agenda items) and in person on May 18.

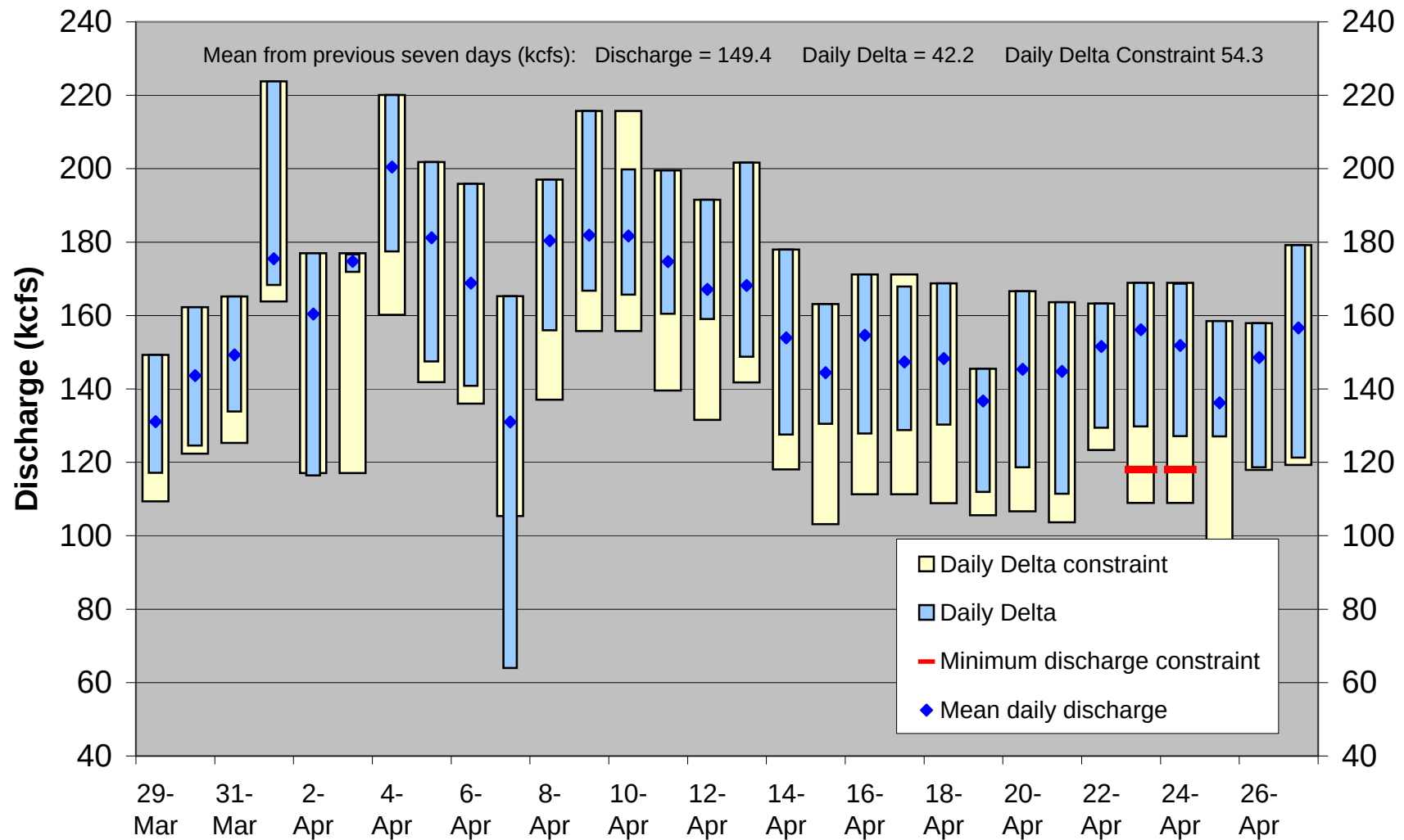
<i>Name</i>	<i>Affiliation</i>
Paul Wagner	NOAA
Rick Kruger	Oregon
Charles Morrill	Washington
Dave Statler	Nez Perce
Russ Kiefer	Idaho
Jim Litchfield	Montana
Scott Bettin	BPA
David Wills	USFWS
Doug Baus	COE
Sheri Sears	Collville Tribe
John Roache	BOR
Laura Hamilton	COE
Karl Kanbergs	COE
Scott English	COE
Doug Baus	COE
Steve Hall	COE
Shane Scott	PPC
Dave Benner	FPC
Rob Allerman	Deutsch Bank
Russ George	WMC
Tara Kelly	JP Morgan
Barry Espenson	CBB
Greg Lawson	Thompson Reuters
Ruth Burris	PGE
Richelle Beck	DRA
Bill Rudolph	NW Fish Letter
Mike Shapley	Snohomish PUD
Tom Lorz	CRITFC

2010-2011 PRD Tailrace Temperatures and HRF CPP constraints



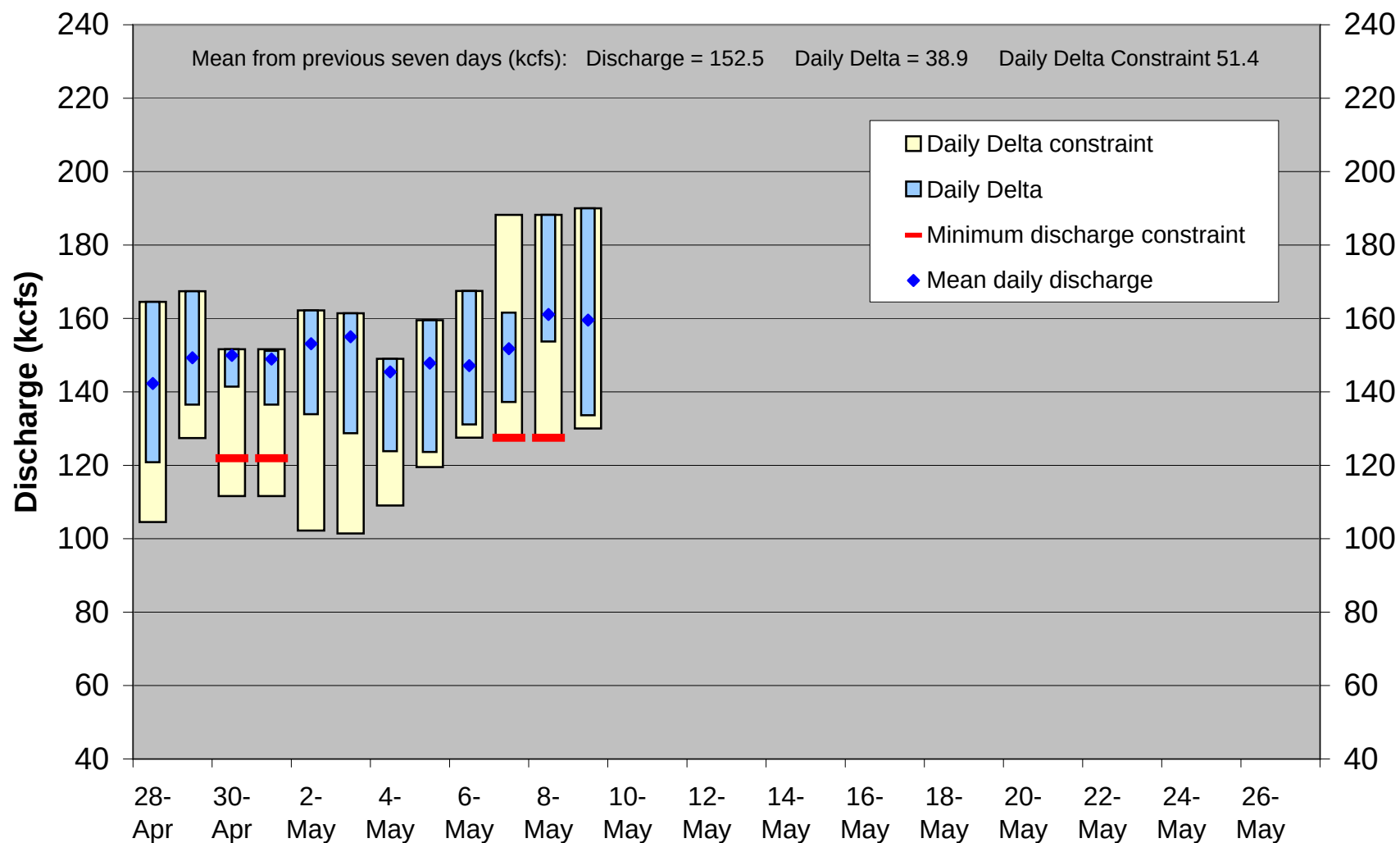
Priest Rapids Dam Operations 2011

Number of exceedances: 2



Priest Rapids Dam Operations 2011

Number of exceedances: 0



TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday May 11, 2011 9:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Vernita Bar Update - Russell Langshaw, Grant County PUD
 - a. [Update](#)
3. Spring Creek Update - Doug Baus, COE-NWD and Dave Wills, USFWS
4. Dworshak Update - Doug Baus, COE-NWD and Gunnar Leffler, COE-NWW
5. Lower Monumental Involuntary Spill - Doug Baus, COE-NWD
 - a. [SOR 2011-02 Corps Summary of Decision](#)
6. Spill Priority List - Doug Baus, COE-NWD
 - a. [Revised List](#)
7. Other
 - a. Set agenda and date for next meeting - **May 18, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

**Corps Summary of Decision
System Operation Request 2011-02
May 6, 2011**

- 1. System Operation Request 2011-02 (SOR 2011-02) Specifications** – Use the Uniform spill pattern when day average flows at Lower Monumental Dam are expected to be at or above 100 kcfs. See Attachment I (SOR 2011-02 received on April 12, 2011).
 - a. The Technical Management Team (TMT) did not reach a unanimous decision to implement SOR 2011-02.
 - b. The Corps proposed an alternative operation to the TMT as follows:

Switch from the Bulk to Uniform pattern at Lower Monumental Dam when either A) flows exceed turbine capacity plus Fish Operations Plan (FOP) spill (occurs at ~140 kcfs) or B) when spill over the FOP specified amount is required due to lack of market spill at any flow level. If either of these conditions is likely to occur for 3 or more days, the Corps will use the Uniform spill pattern instead of the Bulk spill pattern as specified in the 2011 Spring FOP.
 - c. There were no objections to the alternative proposed operation from any TMT sovereigns.
 - d. Oregon elevated the decision on whether to implement SOR 2011-02 to the RIOG.
- 2. RIOG Recommendation on Implementation of SOR 2011-02**
 - a. The Senior Hydro Technical Team convened and prepared a briefing paper on the issue for consideration by the RIOG (Attachment II).
 - b. After review of the briefing paper, there was not unanimous support to implement SOR 2011-02 among RIOG members. See Attachment III (RIOG meeting minutes).
- 3. Corps Decision on Implementation of SOR 2011-02** – The Corps is implementing the 2011 Spring FOP as adopted by the Court in its Order dated March 24, 2011. The Order allows for in-season adjustments through utilization of the existing Regional Forum committees.¹ The Corps' practice for making in-season adjustments that are at variance with the Court-ordered operations has been to do so with agreement or no-objection from all sovereign participants. As noted in 2.b above, the sovereigns did not unanimously support SOR 2011-02. The Corps' decision is not to implement SOR 2011-02 however, in accordance with the unanimous support of the Corps' alternative operation by all sovereigns at TMT, the Corps will implement the proposed alternative operation as stated above (1.b).
 - a. **Corps Rationale** – The Corps took into consideration information from the TMT, the Senior Hydro Technical Team, and the RIOG to make its decision on whether to implement SOR 2011-02. The Corps also relied heavily on the results of a survival study conducted at Lower Monumental Dam in 2009 that compared the survival (concrete and route) of yearling Chinook and steelhead passing the dam under both Bulk and Uniform spill patterns. The study showed there were no statistically significant differences observed under the conditions tested; either in route survival or overall concrete survival. In fact, the point estimates of concrete survival for both yearling Chinook and steelhead were higher under the Bulk spill pattern compared to the Uniform spill pattern. Furthermore, although the 2009 study was not intended to be a performance

¹ In-season adjustments may be needed when unanticipated conditions or circumstances arise, or when new information becomes available warranting a change in Court-ordered operations.

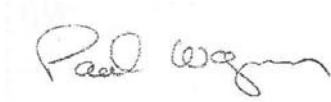
standard evaluation, point estimates of concrete survival were above the BiOp performance standard level (96%) for both yearling Chinook and steelhead under both Bulk and Uniform spill patterns. On this basis, the Corps recommends continuing the Bulk spill pattern under the current project configuration as stated in the 2011 Spring FOP, transitioning to the Uniform spill pattern when over-generation spill occurs as specified in the Corps' alternative operation described in 1.b above.

- b. Next Steps** – In accordance with past practice, the Corps will include the discussion and disposition of SOR 2011-02 and the in-season adjustment agreed to by the sovereigns in the monthly report to the Court.

SYSTEM OPERATIONAL REQUEST: #2011-02

The following State, Federal, and Tribal Salmon Managers have participated in the preparation and support this SOR: National Marine Fisheries Service, US Fish and Wildlife Service, Washington Department of Fish and Wildlife, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, the Shoshone-Bannock Tribes, the Columbia River Inter-Tribal Fish Commission..

TO:	Brigadier General McMahon	COE-NWD
	James D. Barton	COE-Water Management
	Steven Barton	COE-RCC
	David Poganis	COE-P
	Col. Steven Miles	COE-Portland District
	LTC David Caldwell	COE-Walla Walla District
	Karl Wirkus	USBR-Boise Regional Director
	Stephen J. Wright	BPA-Administrator
	Lori Bodi	BPA-PG-5



FROM: Paul Wagner, Chairperson, Salmon Managers

DATE: April 12, 2011

SUBJECT: Lower Monumental Spill Pattern

SPECIFICATIONS:

Beginning immediately, use the uniform spill pattern at Lower Monumental Dam (2011 FPP, Table LMN-13) when day average flows at Lower Monumental Dam are expected to be at or above 100 Kcfs. The ERDC modeling trip planned for next week will be used to evaluate whether reducing the flow trigger to 80 or 90 Kcfs for this change is advisable. When day average flows at Lower Monumental are expected to be below this trigger, use the bulk spill pattern at Lower Monumental Dam (2011 FPP, Table LMN-12).

JUSTIFICATION:

Concerning spill patterns at Lower Monumental Dam, the 2011 Spring Fish Operation Plan¹ states:

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.

While the bulk pattern can show higher survival under certain flow and power house loading conditions, the conditions prevailing at the current time and going forward for the next several weeks favor the use of the uniform spill pattern. The uniform pattern can create a large eddy when the power house is lightly loaded. This eddy increases the risk to both fish that passed over the spillway and fish that are discharged through the juvenile bypass pipe. Under the existing conditions of a more fully loaded powerhouse the uniform pattern will not create a large eddy and will increase the number of fish being passed by way of the spillway by allowing higher spill volume.

The Ice Harbor forebay TDG monitor is typically the limiting factor for the Lower Monumental spill caps. In the 2009 study of bulk and uniform spill patterns at Lower Monumental Dam, the spill cap at Lower Monumental Dam was routinely higher when operating under the uniform pattern than when operating under the bulk pattern. This indicates that TDG from Lower Monumental may be reduced if Lower Monumental Dam were to be operated under the uniform spill pattern. During this test, average spill proportions under the two spill patterns were 0.27 for the bulk spill pattern and 0.38 for the uniform spill pattern.

Using a uniform spill pattern at Lower Monumental Dam when flows are at or above 100 Kcfs would generate less total dissolved gas and allow a higher proportion of juvenile fish to pass Lower Monumental Dam via spillways, while not detracting from direct survival.

¹ http://www.nwd-wc.usace.army.mil/tmt/agendas/2011/0323_Spring_Fish_Operations_Plan.pdf.

RIOG BRIEFING PAPER: Hydro Dispute 2011-1

5-2-2011

Technical TEAM NAME	Senior Hydro Technical Team
Statement of Issue: <i>in a Nutshell</i>	Salmon managers requested (System Operational Request #2011-02) that the Corps of Engineers adopt a uniform spill pattern at Lower Monumental Dam when day average flows equal or exceed 100 kcfs (April 12, 2011). The Corps declined to implement the SOR (April 27, 2011). The Corps then proposed and is prepared to implement the uniform spill pattern when A) flows exceed turbine capacity plus voluntary spill (total Q of about 140 kcfs) <u>or</u> B) when spill is required due to lack of market (at any flow range) whenever either of these conditions are likely to occur and persist for three or more days (April 27, 2011). No party has opposed this to date. Either the SOR or the Corps' counter proposal is a change to the FOP and subsequent court order which calls for bulk spill. This means that changes must be supported or not opposed by all of the sovereign parties and the court will be notified of the change. The issue is whether or not to implement the SOR (above and beyond the Corps' proposed alternative operation).
Timeframe for Decision	As soon as possible the week of May 1 st .
Species at Issue	Juvenile Snake River steelhead, spring/summer Chinook salmon, and sockeye salmon and Pacific Lamprey.
Status of Species	SR steelhead, spring/summer Chinook salmon, and sockeye are listed under the ESA. Pacific Lamprey are not listed at present, but they are at very low abundance and are acknowledged as a species of concern. Compared to 10-year averages, returns of wild Snake River steelhead and spring/summer Chinook salmon have been relatively high in recent years. Snake River sockeye returns have also been higher than the 10-year average. Returns have not been reassessed relative to delisting criteria.

Decision Options	Whether or not to adopt the uniform spill pattern at Lower Monumental Dam when flows equal or exceed 100 kcfs (consistent with SOR #2011-02).
Relevant Scientific Information	SURVIVAL STUDIES • Hockersmith et al. 2010 (2008 LMN survival study). - o The study stated that Bulk and Uniform patterns converged above 100 kcfs. However, the spill pattern tables in the Fish Passage Plan do not support this contention. • Hockersmith et al. 2010 (2009 LMN survival study). There were no statistically significant differences in direct concrete, spillway/RSW, or juvenile bypass system survival observed in 2009 when flows averaged about 100 kcfs (32 to 172 kcfs). Uniform spill reduced the percentage of fish passing via the Bypass System by 3% (steelhead) and 7% (yearling Chinook, statistically significant difference). Spill effectiveness was significantly ($P = 0.000$) less during uniform spill than during bulk spill for both yearling Chinook salmon and juvenile steelhead). Uniform spill reduced median forebay residence time for Chinook by what the authors deemed only about 50 minutes, a statistically significant difference (2.8 hours compared to 3.6 hours). There were no statistically significant differences in forebay survival under either treatment for either species. Tailrace egress passage times were about 5-6 minutes for both Bulk and Uniform spill patterns (to 500 meters below the project). <u>Concrete Survival</u> - o <i>Single-release concrete survival estimates were not statistically different.</i> ▪ Bulk: 95.0% for Chinook and 96.9% for steelhead ▪ Uniform: 95.8% for Chinook and 96.0% for steelhead - o <i>Paired-release concrete survival estimates were not statistically different.</i> ▪ Although the 2009 study was not a “performance standard test”, paired-release concrete survival point estimates were above the BiOp performance standard level (96%) for both species under both

Bulk and Uniform spill patterns

- *Bulk: 97.5% for Chinook and 97.6% for steelhead*
- *Uniform: 97.3% for Chinook and 96.7% for steelhead*

Spillway/RSW Survival

- o *Point estimate Spillway/RSW survival was higher for Chinook under Uniform and higher for steelhead under Bulk*
- o *Single-release spillway/RSW survival estimates were not statistically different.*
 - *Bulk: 94.7/96.3% for Chinook and 98.3/99.0% for steelhead*
 - *Uniform: 96.2/97.3% for Chinook and 97.4/98.6% for steelhead*
- o *Paired-release spillway/RSW survival estimates were not statistically different.*
 - *Bulk: 97.2/98.8% for Chinook and 99.1/99.8% for steelhead*
 - *Uniform: 97.6/98.8% for Chinook and 98.2/99.3% for steelhead*

Bypass Survival

- o *Point estimate Bypass survival was higher under the Bulk treatment for both Chinook and steelhead*
- o *Single-release Bypass survival estimates were not statistically significant.*
 - *Bulk: 94.3% for Chinook and 93.3% for steelhead*
 - *Uniform: 93.1% for Chinook and 89.7% for steelhead*
- o *Paired-release Bypass survival estimates were not statistically different:*
 - *Bulk: 96.5% for Chinook and 93.9% for steelhead*
 - *Uniform: 94.3% for Chinook and 89.9% for steelhead*

BYPASS EFFECTS

NOTE: The following studies did not capture significant changes in

configuration and operations in recent years.

There is evidence that bypassed fish have lower than expected adult returns compared to undetected fish passing Lower Monumental Dam through other passage routes. However, bypassed fish may not represent the undetected population. (Buchanan et al, 2011; and Comparative Survival Study, 2010; and Petrosky and Schaller. 2010). The following statements are relative to non-detected fish.

- 2010 Comparative Survival Study (CSS) Annual Report
 - o Chinook SARs reduced 10% per bypass experience
 - o Steelhead SARs reduced 6% per bypass experience
 - o Study predicts that increased spill (system-wide) results in increased juvenile survival and SARs
- Buchanan et al. 2011
 - o Spring Chinook returned 2-36% fewer than expected
 - o Summer Chinook returned 2-28% fewer than expected (not statistically significant in all years, especially in recent years)
 - o Steelhead returned 11-41% fewer than expected.

TRANSPORTATION EFFECTS

- NWFSC 2010 – Transport Analysis paper
 - o There are general seasonal trends for transported vs inriver migrating fish at Lower Granite and Little Goose Dams (presumably this is also occurring at LMN, but small sample sizes precluded establishing a seasonal pattern).
 - o Prior to 2006, Transport to Migrant (T:M) ratios generally favor transported fish after May 1 (arrival at LGR) or later (statistically significant);
 - o T:M ratios in 2006-2008 had some exceptions to this pattern: wild and hatchery Chinook and hatchery steelhead in 2006, and hatchery Chinook in 2008 favored inriver migrating fish in the first or second week of May
- CSS Ten Year Retrospective Report

	- o Annual estimates of transport benefits indicates that of the three Snake River transport projects the benefits of transportation are lowest from Lower Monumental. ERDC MODELING • 2008 Modeling was done to develop acceptable spill patterns for both the Bulk spill and Uniform spill patterns for testing. • 2011 (April) Modeling indicated that egress conditions appeared to be better for the RSW under the Uniform spill pattern (at or above 100 kcfs – the flow trigger proposed in the SOR). (Trip Report is being developed, but will likely not be ready this week.) PREDATORS • WDFW SMP - Lower Monumental Project Weekly Report # 11-03 - o WDF&W staff indicates that bird numbers are relatively high (compared to other recent years) in the vicinity of LMN this year, especially at the bypass outfall. LAMPREY • Tribal Pacific Lamprey Restoration Plan (DRAFT). 2008. - o Impingement of juvenile lamprey on turbine screens has been observed - o 98% of impinged lamprey are unable to free themselves • Fyke-net studies – 20-30% of juvenile lamprey could come into contact with turbine screens. • Behavior of lamprey (passage route selection) is unknown, but some presumably pass via spill.
Other Considerations/Impacts	Differences in operations are primarily constrained to the 100 – 140 kcfs flow band. Implementing the SOR will increase spill from 5 to 10 kcfs compared to Bulk spill, reducing the proportion of juveniles passing LMN through the bypass system and available for transport, once initiated. However, it is impossible to estimate the amount of time that the SOR would actually result in increased spill because it is difficult to predict when the operation proposed by the Corps will result in the same spill pattern requested in the SOR. While there would be a cost to this operation, there are too many uncertainties to estimate accurately

FCRPS BiOp Implementation 2008-2018

RIOG - REGIONAL IMPLEMENTATION OVERSIGHT GROUP

	(probably less than \$1 million). Currently flows are in the low 90s (kcfs). The most recent river flow forecast available (April 29) indicates that flows at LMN will not exceed 100 kcfs until May 5, and will reach 135 kcfs by May 10. Transport operations (collection) at LMN will start May 8. Starting approximately June 21, summer spill operations begin and spill pattern is no longer an issue because the Bulk pattern's wide gate openings at 17 kcfs spill (as called for in previous summer Fish Operations Plans) are preferred for safe juvenile passage. The difference between the Corps proposed operation and implementing the SOR will depend upon the length of time that flows at LMN are within the 100-140 kcfs flow band. The longer the time flows are in this band, the larger the difference between the two operations.
Views / Positions of Team Members & Brief Explanation	This report is being submitted on behalf of the Senior Hydro Technical Team for consideration by RIOG. The Team declined to provide policy views / positions.
Contacts	Oregon -- Rick Kruger Idaho -- Jim Yost and Pete Hassemer Montana -- Jim Litchfield CTUIR -- Tom Lorz Nez Perce -- Dave Statler NOAA -- Ritchie Graves and Paul Wagner USFWS -- Mark Bagdovitz and Dave Wills BPA -- Rick Pendergrass and Jason Sweet BOR -- Lori Postlethwait COE -- Dan Feil, David Clugston, and Steve Barton

FCRPS BiOp Implementation 2008-2018

RIOG - REGIONAL IMPLEMENTATION OVERSIGHT GROUP

Meeting notes: May 4, 2011	Meeting notes and other RIOG materials are posted at: https://secure.bpa.gov/FCRPS_Implementation/Logon.aspx
Admin. Notes	• Briefing paper developed by Senior Hydro Technical Team • Oregon papers were submitted the morning of the RIOG call and did not get discussed by Senior Hydro Technical team • The RIOG welcomes any comments and suggested modifications to the briefing paper template.
Lower Monumental Operations Briefing Paper	Ritchie Graves reviewed the briefing paper. The issue is whether to implement the SOR (above and beyond the Corps' proposed alternative operation). The issue is only relevant when flows are between 100-140 kcfs. It is difficult to predict exact conditions when this operation would be relevant. Transportation operations will begin May 8. Key points from briefing paper: • There were no statistically significant differences in direct concrete, spillway/RSW, or juvenile bypass system survival observed in 2009 when flows averaged about 100 kcfs (32 to 172 kcfs). • Uniform spill reduced the percentage of fish passing via the Bypass System by 3% (steelhead) and 7% (yearling Chinook, statistically significant difference). Spill effectiveness was significantly ($P = 0.000$) less during uniform spill than during bulk spill for both yearling Chinook salmon and juvenile steelhead). • Uniform spill reduced median forebay residence time for Chinook by what the authors deemed only about 50 minutes, a statistically significant difference (2.8 hours compared to 3.6 hours). There were no statistically significant differences in forebay survival under either treatment for either species. Tailrace egress passage times were about 5-6 minutes for both Bulk and Uniform spill patterns (to 500 meters below the project).
Discussion	Question: How does the Oregon chart fit in? Response: The chart shows an average, which rarely happens. Question: Do we know when or how fast the runoff will be? Response: It is difficult to predict more than 8-10 days out. Question: The information presented seems to indicate that flows would be below 100 kcfs for the next 8-10 days, is that correct? Response: Yes

Meeting notes: May 4, 2011	Meeting notes and other RIOG materials are posted at: https://secure.bpa.gov/FCRPS_Implementation/Logon.aspx
	Question: What were the reasons co-managers supported SOR? NOAA Response: At the time, we were looking at ways to reduce Total Dissolved Gas (TDG) in a high flow scenario. However, the situation now is different. Question: How does the lack of market load affect the Corps' decision? Response: Lack of market load creates more spill so we need to manage it for TDG. Question: Are we likely to see more TDG when flows are 100-140 kcfs? Response: We can manage to state standards within this flow range, unless there is lack of market load. Oregon believes that such high flow conditions may still occur. In addition, they are concerned about predation by pelicans at the bypass outfall. They stated that it's better if fewer fish go through the bypass system. The Corps believes that while not statistically significant, survival is higher under bulk spill. In addition, they stated that they are taking additional measures such as hazing to manage predation. The Corps considered input and comments about bulk spill in the Fish Operations Plan. Now we are under Court order and we need a high standard to change it.
Sovereign views	Question: Do you support the SOR to add uniform spill between 100-140 kcfs? Washington: No solid position in either direction; we do not find the evidence compelling either way. We hope that whatever flow season occurs, we minimize the controversies. Montana: No we do not support the SOR because we do not see conclusive evidence that it adds value to the fish. We support the Corps' alternative operation. Oregon: Yes we support the SOR Idaho: No we do not support the SOR. We support the Corps' alternative operation. Nez Perce: Yes, we support the SOR because it seems like we could be operating within the flow range for some time and because there seems to be better survival by avoiding the bypass, including for lamprey. Also, we should err in favor of the fish in a high flow year. Warm Springs: We support the Corps' alternative operation.

Meeting notes: May 4, 2011	Meeting notes and other RIOG materials are posted at: https://secure.bpa.gov/FCRPS_Implementation/Logon.aspx
	Umatilla: We support the Corps' alternative operation. FWS: No preference. Either operation would be acceptable. Reclamation: We support Corps' alternative operation. BPA: We support Corps' alternative operation. NOAA: We do not support the SOR. Across concrete survivals not significantly different. Passage survival is relatively high for both operations. While bypass effects may decrease survival, transport benefits will be reduced under the uniform spill pattern.
Next Steps	Rock Peters will get a written decision in the next few days. Until then, they will continue current operations. They will notify the Court via the monthly report.
Participants	Washington - Guy Norman Montana - Bruce Measure, Jim Litchfield Oregon - Joan Dukes Idaho - Shirley Lindstrom Corps - Rock Peters, Dan Feil BPA - Sarah McNary, Jason Sweet FWS - Mark Bagdovitz Reclamation - Kate Puckett Nez Perce Tribe - Dave Johnson, Dave Statler Warm Springs – John Ogan Umatilla – Brent Hall CRITFC – Rob Lothrop

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

May 11, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Notice

It was announced that the next TMT meeting, on 5/18, will be held at BPA in Room 122. Anyone who wants to attend in person was advised to email Tony Norris at ranorris@bpa.gov to be added to the security list.

Performance Standard Testing at John Day

This agenda item was added during the meeting. Doug Baus, COE, and Brad Eppard, Portland District COE, shared that the current performance standard testing at John Day, using a four day spill treatment block of 30% for 2 days and 40% for 2 days, was underway. The latest STP forecasts showed flows increasing to levels that would not allow the COE to spill at 30% at the project next week. Given this, they proposed shifting the treatment schedule to allow for more testing at 30% this week (beginning tonight and continuing with this block through 5/17) followed by 40% testing next week and continued alternating treatments throughout the rest of the test. Given that the test was not designed to be a comparison of the two treatments, rather to test an equal number of treatments, the COE believes there will be no adverse effects to using this alternate schedule, given there would still be equal blocks for each treatment. Brad did acknowledge that the 30% treatment would not be tested during the latter part of the run.

TMT members present – Washington, Montana, NOAA, BOR and BPA – did not raise any specific objections to this proposed operation; some members said they would need to confer with their offices and would like another opportunity to respond.**

Action: Doug Baus, COE, sent an email to TMT immediately following today's meeting that outlined the COE's proposed operation for John Day performance standard testing and asked TMT members to respond with any questions, comments, or objections to the proposed action by 12:00pm on Friday, 5/13. The email said parties not responding will be assumed to not object.

Brad Eppard also planned to coordinate via email with FPOM and bring this issue to a SRWG meeting on Friday, 5/13, to be sure the information and planned operation is shared with all interested regional parties.

** Upon further regional coordination, and with no objections, the COE agreed to implement the following test schedule:

May 9 2000 Hours 40%

May 11 2000 Hours 30%

May 13 2000 Hours 30%

May 15 2000 Hours 40%

May 17 2000 Hours 30%

May 19 2000 Hours 40%

The treatments continue in this 30%/40% pattern for the remainder of the test.

Vernita Bar Update

Russell Langshaw, Grant County PUD, shared an update on the Hanford Reach and Vernita Bar operations. Mean temperatures had reached 945 temperature units from the end of spawning. The program was projected to end on June 20. Russell said this year's operations were going well and that there had been no exceedances since his last report to TMT on 4/22. The mean daily discharge was around 150 kcfs for the two weeks he presented, and the upcoming weekend would be the last for higher weekend flows. Russell said with the shorter duration between minimum and maximum flows, not as many samples were collected, and he suggested the operation was good in terms of minimizing stranding and entrapment. He will share another report with TMT at the 6/2 meeting.

Spring Creek Release Update

Doug Baus, COE, reported that operations to support the second Spring Creek Hatchery release (of 4.6 million juvenile Fall Chinook) began on May 4 and were expected to conclude on May 12. Mortalities and descaling were reported to be very low and the operation this year has gone well. The USFWS will be invited to share a summary report on the outcome of the operations at the 6/1 TMT meeting.

Dworshak Operations Update

Doug Baus, COE, and Steve Hall, Walla Walla District COE, updated TMT on Dworshak operations. The project had been providing flow augmentation per TMT request and was now refilling, currently releasing 2.5 kcfs. This discharge might increase if high flows continue to enter the system. Per BPA's request, the flows were currently being shaped to support morning heavy load hours. Inflows have come up dramatically in the last few days and some low lying snow stations were showing melt and runoff. Warming expected later this week will likely tip off higher inflows with more areas producing runoff. TMT will receive another update on Dworshak operations at the 5/18 TMT meeting.

SOR 2011-02 COE Summary of Decision on Lower Monumental

Doug Baus, COE, referred TMT to the link on today's agenda for this item. The link contained the COE's summary of decision on SOR 2011-02, with appendices: the SOR, Sr. Hydro Team Briefing Memo and RIOG paper. Without regional consensus on the SOR, the COE decided not to implement the request. However, given no objections, the

COE will implement an alternative operation brought to TMT and also discussed at the Sr. Hydro Team and RIOG team meetings. It is as follows:

Switch from the Bulk to Uniform pattern at Lower Monumental Dam when either:

- A) flows exceed turbine capacity plus Fish Operations Plan (FOP) spill (occurs at ~140 kcfs); or
- B) when spill over the FOP specified amount is required due to lack of market spill at any flow level. If either of these conditions is likely to occur for 3 or more days, the Corps will use the Uniform spill pattern instead of the Bulk spill pattern as specified in the 2011 Spring FOP.

Doug concluded by saying the COE would monitor conditions closely and notify TMT if the above conditions were met and a change to the spill pattern at Lower Monumental was made.

Other: Spill Priority List

Doug Baus, COE, reported that he sent a revised spill priority list to TMT members earlier today and asked members to review it and send any concerns or objections to him by 3:00 pm on Friday, 5/13. He said the changes made were based on previous discussions and coordination with TMT members; the main change was the addition of a "Level 2" list for TDG levels at 122%.

Action: Doug will post the list on the TMT page for review by all. Paul Wagner, NOAA, said he would coordinate with FPAC on this issue and respond to the COE by Friday.

Next Meeting, 5/18 Face to Face at BPA:

Agenda items include:

- o May Final Water Supply Forecasts
- o Dworshak Operations
- o Libby Operations
- o Spring Creek Hatchery Release Report
- o Operations Review
- o Other?

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 11, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of BPA, BOR, Washington, NOAA, COE and others attended. (Several TMT members were absent from TMT today to attend a workshop on delayed mortality.) This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

Next week's TMT meeting on May 18 will be held at BPA headquarters in room 122. Prospective attendees should email Tony Norris at ranorris@bpa.gov so he can put their names on the security list.

2. Performance Standards Testing at John Day Dam

Baus reported the latest STP forecast indicates it will be difficult for the COE and BPA to achieve the 30% spill treatment associated with the John Day spill test in the near future. This item was added to today's agenda so the COE could propose an alternative operation that could help achieve additional 30% treatments.

Brad Eppard, COE Portland, explained the proposal. The current study design calls for two treatments alternating between 30% and 40% spill in four-day blocks, or two days per treatment. In an effort to obtain as many 30% spill treatments as possible before there is a significant increase in inflows at John Day Dam, the COE proposed to keep spill at 30% on May 13, effectively swapping a 40% spill period with a later 30% spill period that is scheduled to begin when higher flows are expected. Under the current schedule, tonight spill at John Day will drop to 30% and rise to 40% again on May 13, when the COE proposes to keep it at 30%. Another 40% block scheduled to start May 15 would be kept at 30%. The next 40% block would start May 17. The goal of this plan is to test an equal number of treatments throughout the season and capture enough 30% spill data to satisfy the precision requirements associated with BiOp survival estimates.

Paul Wagner, NOAA, asked what tradeoffs are involved in deviating from the random study design. Because the two treatments are not being compared, the COE did a systematic, not randomized, schedule that switches spill levels every two days. Because this is a BiOp performance test, the COE is soliciting comments from the region on its proposal.

NOAA, Washington and Montana expressed no initial objections but wanted to reserve final judgment until they could consult with internal and local experts. **BOR** and **BPA** had no objections to the proposal. Baus will contact TMT members who were not on the call today. He asked TMT members to notify him by 12:00 pm on May 13 if there are any objections. This comment deadline will allow the COE to prepare for the switch at 8 pm on May 13. FPOM will discuss this issue tomorrow, and SRWG will discuss it on Friday.

3. Vernita Bar Update

Russell Langshaw, Grant PUD, reported that the protection flow operation is 945 temperature units from the end of spawning, with another 450 TUs to go. Protection flows are projected to end on June 20.

Langshaw presented three figures attached to today's agenda that document program results since he last reported to TMT. There have been no exceedances since then, and the average daily delta is 42 kcfs. From March 29 to April 28, the average daily delta constraint was 54.3 kcfs, and from April 28 to May 9, it was 51.4 kcfs, with a mean daily discharge of 152.5 kcfs. This weekend is the last of four weekends with higher minimum flows to help minimize stranding and entrapment, the main goal of the program. This year's program appears to be very successful. Langshaw will give TMT another update at the June 1 TMT meeting.

4. Spring Creek Hatchery Update

Doug Baus reported for Dave Wills, USFWS, who could not join today's call. On May 4 the hatchery released 4.6 million juvenile fall chinook. The Bonneville special operation began at 6 pm on May 4 and will continue until 5 pm, May 12. Overall, mortality and descaling rates have been very low. There will be a follow-up report after the operation ends.

5. Dworshak Update

Dworshak is currently refilling and discharging 2.5 kcfs, Baus reported. Outflows were lowered to 2.5 kcfs on May 8 when COE analysis showed the project was bumping up against its 95% confidence interval of being able to refill, Steve Hall, COE Walla Walla, explained. The COE could ramp flows up again later in the season if precipitation continues to be heavy. However, at this point the forebay elevation is around 30 feet below its normal flood control refill curve.

Paul Wagner asked why the 2.5 kcfs is apparently being shaped with higher flows during some hours. BPA requested some load shaping into the early morning heavy load hours, Hall replied. Charles Morrill, Washington, asked what the expectations are for snowpack and water accumulation in the basin. Inflows to Dworshak rose dramatically in response to rainfall over the weekend, Hall

said. Some of the low-lying stations in the Clearwater basin show that snowmelt is beginning, with the higher stations not showing snowmelt yet. Large inflows are anticipated when melting begins in earnest. Hall will give TMT another report on Dworshak operations at the May 18 TMT meeting.

6. Lower Monumental Involuntary Spill: COE Summary of Decision on SOR 2011-2

Baus introduced TMT to substantial documentation of the COE's decision not to implement SOR 2011-2. The documents are linked to today's agenda, including a RIOG briefing paper and notes from their May 2 discussion of the Salmon Managers' request.

Without regional consensus on the SOR, the COE decided not to implement the request. However, given no objections, the COE will implement an alternative operation brought to TMT and also discussed at the Sr. Hydro Team and RIOG team meetings. It is as follows: Switch from the Bulk to Uniform pattern at Lower Monumental Dam when either: A) flows exceed turbine capacity plus Fish Operations Plan (FOP) spill (occurs at ~140 kcfs); or B) when spill over the FOP specified amount is required due to lack of market spill at any flow level. If either of these conditions is likely to occur for 3 or more days, the Corps will use the Uniform spill pattern instead of the Bulk spill pattern as specified in the 2011 Spring FOP.

Gumpert observed that this was TMT's first trial of the new dispute resolution process through RIOG and it appears to have gone well. The COE will continue to monitor forecast information and real-time conditions for the triggers to begin this operation at Lower Monumental.

7. Modifications to the Proposed Spill Priority List

This item was added to today's agenda at the request of Doug Baus. This morning he emailed all TMT members the COE's proposed modifications to the spill priority list. He will also post the modified list to the TMT website.

Baus requested that TMT members notify him by 3 pm, May 13, if they have any questions or objections to the modified spill priority list. The COE is looking to implement the modified list, which incorporates recommendations made by TMT, on May 13. Baus pointed out that it introduces a new TDG category of 122%, midway between 120% and 125%.

8. Next Meeting

The next TMT meeting will be on May 18 at BPA headquarters. Topics on the agenda include a follow-up report on the Spring Creek Hatchery release, a Dworshak operations update, the modified spill priority list, water supply

forecasts, Libby operations, juvenile passage on the Snake River, water quality, and the usual operations review.

<i>Name</i>	<i>Affiliation</i>
Doug Baus	COE
Tony Norris	BPA
John Roache	BOR
Charles Morrill	Washington
Glen Trager	Iberdrola
Paul Wagner	NOAA
Russ George	WMC
Doug Vine	Thompson Reuters
Rob Allerman	Deutsch Bank
Laura Hamilton	COE
Kim Johnson	COE
Scott English	COE
Gunnar Leffler	COE
Richelle Beck	DRA
Tara Kelly	JP Morgan
Christine xx	Cargill
Brad Eppard	COE Portland
Mike Shapley	Snohomish PUD
Russell Langshaw	Grant PUD
Ruth Burris	PGE
Scott Bettin	BPA
Alex Cibarra	Grant PUD
Brian Marotz	Montana
Steve Hall	COE Walla Walla
Tim Heizenrader	Centaurus

TMT Members and Alternates:

Based on previous TMT recommendations to restructure the spill priority list the Corps proposes to implement the following spill priority list.

PROPOSED SPILL PRIORITY LIST – FISH PASSAGE SEASON EFFECTIVE 15:00 13 MAY 2011

LEVEL I

LWG	Spill to 120% TDG
LGS (night)	Spill to 120% TDG
MCN	Spill to 120% TDG
LMN	Spill to 120% TDG
IHR	Spill to 120% TDG
LGS (day)	Spill to 120% TDG
TDA	Spill to 120% TDG
JDA	Spill to 120% TDG
BON	Spill to 120% TDG
DWR	Spill to 110% TDG
CHJ	Spill to 120% TDG
GCL	Spill to 110% TDG

LEVEL II

LWG	Spill to 122% TDG
LGS (night)	Spill to 122% TDG
MCN	Spill to 122% TDG
LMN	Spill to 122% TDG
IHR	Spill to 122% TDG
LGS (day)	Spill to 122% TDG
TDA	Spill to 122% TDG
JDA	Spill to 122% TDG
BON	Spill to 122% TDG
CHJ	Spill to 122% TDG
GCL	Spill to 115% TDG

LEVEL III

LWG	Spill to 125% TDG
LGS (night)	Spill to 125% TDG
MCN	Spill to 125% TDG
LMN	Spill to 125% TDG
IHR	Spill to 125% TDG
LGS (day)	Spill to 125% TDG
TDA	Spill to 125% TDG
JDA	Spill to 125% TDG
BON	Spill to 125% TDG
CHJ	Spill to 125% TDG
GCL	Spill to 120% TDG

LEVEL IV

LWG	Spill to 130% TDG
LGS (night)	Spill to 130% TDG
MCN	Spill to 130% TDG
LMN	Spill to 130% TDG
IHR	Spill to 130% TDG
LGS (day)	Spill to 130% TDG
TDA	Spill to 130% TDG
JDA	Spill to 130% TDG
BON	Spill to 130% TDG
CHJ	Spill to 130% TDG
GCL	Spill to 125% TDG

DAY IS DEFINED AT 06:00-17:59. NIGHT IS DEFINED AS 18:00-05:59.

TMT Members are requested to respond with any questions, comments, or objections to this proposed action by 3:00 PM Friday, May 13, 2011. Parties not responding will be assumed to not object.

SYSTEM OPERATIONAL REQUEST: FWS #1

TO:	BG John R. McMahon	COE-NWD
	Jim Barton	COE-Water Management
	Steve Barton	COE-RCC
	David Ponganis	COE-PDD
	Col. Anothony O. Wright	COE-Seattle District
	J. William McDonald	USBR-Boise Regional Director
	Steven Wright	BPA-Administrator
	Steve Oliver	BPA-PG-5

FROM: Brian Kelly, State Supervisor, U.S. Fish and Wildlife Service, Idaho Fish and Wildlife Office, on behalf of the Libby BO Policy Group

DATE: May 16, 2011

SUBJECT: 2011 Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows

SPECIFICATIONS:

Based on the Fish and Wildlife Service's February 2006 Biological Opinion (2006 BO) on operations of Libby Dam, and the May final April-August volume runoff forecast of 8.165 million acre-feet, we are within a Tier 5 operations year for Kootenai River white sturgeon. The minimum recommended release volume for sturgeon conservation in a Tier 5 year is 1.20 million acre-feet and we recommend the following procedures for discharge of at least this minimum volume from Libby Dam:

- **With Spill (reservoir above elevation 2415')**

Begin releases of sturgeon volume from Libby Dam once the following conditions are met: Kootenai River temperatures at Bonners Ferry reach 8° C, and Koocanusa Reservoir elevation reaches at least 2,415' MSL; at least one tagged F4 sturgeon is positioned at Ambush Rock; and the forebay of Koocanusa Reservoir warms such that 20-35,000 cubic feet per second (cfs) can be released in unison through the turbines and over the spillway without decreasing Libby Dam release temperatures by more than 2° C.

Ascending Limb: When these conditions are met, increase discharge from Libby Dam (according to ramping rates in the 2006 BO) to 15,000 cfs for 3 days, followed by discharge of 20,000 cfs for 3 days, discharge of full powerhouse capacity (PHC) for 3 days, and maintain peak discharge of PHC plus spill of up to 10,000 cfs for 7 days.

Alternatively, if discharges from Libby Dam are higher than 15,000 cfs prior to commencement of sturgeon operations, once the conditions described above are met, increase discharge from Libby Dam (according to ramping rates in the 2006 BO) to 20,000 cfs for 4 days, followed by discharge of PHC for 5 days, and maintain peak discharge of PHC plus spill of up to 10,000 cfs for 7 days.

Descending Limb: At approximately 6:00 AM, following peak outflow, reduce discharge from Libby Dam to PHC for 4 days. After four days at PHC, reduce discharge to 20,000 cfs for at least 3 days. This discharge period may be extended if necessary to reduce the rate of reservoir refill.

- If the modeled summer flat flow (targeting reservoir elevation of 2,439' at the end of September) is 15,000 cfs or greater, maintain discharge of 17,000 cfs until the sturgeon volume is exhausted.
- If the modeled summer flat flow is less than 15,000 cfs, then starting at about 6:00 AM, following the period of 17,000 cfs discharge, reduce Libby Dam discharge to 15,000 cfs, then maintain 15,000 cfs discharge until the sturgeon volume is exhausted, or gradually reduce discharge to the summer flat flow. During this gradual discharge reduction, the Corps should avoid a double peak in outflow between sturgeon and summer operations.

Note: The intent of extending flow at this rate is to delay reservoir refill until inflows recede to below turbine discharge capacity, and to make a smooth transition from the spring peak to the lower, stabilized summer flow.

- **Without Spill**

Given the higher water supply volume in the Kootenai Basin in 2011, it is likely that flood risk reduction operations will supersede sturgeon augmentation operations. In such a scenario, Kootenai River stages may be at or near flood stage prior to sturgeon operations, rendering spill unfeasible or undesirable.

As always, flood risk reduction operations supersede sturgeon flow augmentation, and dam managers will coordinate operations with regional sturgeon managers.

Sturgeon augmentation discharge may be extended for additional days if the Corps elects to provide volume in excess of the minimum volume requirement in the 2006 BO and to control the refill rate of Libby Dam.

Provide stable or gradually declining discharge through the end of September following ramping rates and minimum flow guidelines in the 2006 BO for bull trout and white sturgeon.

Additional recommendations may be provided as water supply forecasts are updated.

JUSTIFICATION:

A continued effort is needed to provide spawning and incubation flows to meet habitat attributes for depth, velocity and temperature in the Kootenai River as defined in the 2008 BO Clarified Reasonable and Prudent Alternative (RPA) for Kootenai River white sturgeon (Table 1). The clarified RPA states that if 2008 and 2009 sturgeon operations at Libby Dam are determined to be “not successful”, the action agencies (the Corps and BPA) will operate Libby Dam in 2010 through 2012 to provide additional flows by spilling in excess of powerhouse capacity consistent with a waiver of the Total Dissolved Gas (TDG) water quality standard provided by the State of Montana. The Service issued its determination of “not successful” for 2008 sturgeon operations on April 20, 2009, and issued a “not successful” determination for 2009 operations on December 16, 2009, thus triggering the action agencies to implement provisions to provide flows in excess of powerhouse capacity in operating years 2010 through 2012.

The USGS performed data analysis of the 2006 through 2009 sturgeon augmentation flows in order to assess depth attribute attainment as per the 2006 BO. Kootenay Lake backwater extent varied, but in general a flow of roughly 35,000 cfs at Bonners Ferry provided river depth in the braided reach (RM 152 to RM 157) that met or exceeded the minimum 16.5 ft depth attribute.

Table 1. Kootenai Sturgeon Habitat Attributes from 2008 Libby Dam BO RPA Clarification.

Attribute	Measure	Objective
Area: RM 141.4 to RM 159.7		
Timing of Augmentation Flows	May into July (triggered by sturgeon spawning condition), in all years except for Tier 1.	Provide conditions for normal migration and spawning behavior.
Duration of Peak Augmentation Flows for Adult Migration and Spawning	Maximize peak augmentation flows with available water for as many days as possible, up to 14 days during the peak of the spawning period with pulses ¹ , in all years except for Tier 1.	Through in-season management, provide peak augmentation flows that lead to a biological benefit for sturgeon to maximize migration and spawning behavior via a normalized hydrograph.
Duration of Post-Peak Augmentation Flows for Incubation and Rearing	Maximize post-peak augmentation flows with available water for as many days as possible, up	Through in-season management, provide post-peak augmentation flows that lead to a

¹ Kootenai sturgeon spawn on the descending limb of the hydrograph. “Pulses” refer to slight reductions in flow during this two-week period to initiate spawning.

	to 21 days, in all years except for Tier 1.	biological benefit for sturgeon to maximize embryo/free-embryo incubation and rearing via descending limb of a normalized hydrograph.
Minimum Flow Velocity ²	3.3 ft/s and greater in approximately 60% of the area of rocky substrate in the area of RM 152 to RM 157 during post-peak augmentation flows.	Provide conditions for spawning and embryo/free-embryo incubation and rearing.
Temperature Fluctuation	Optimize temperature releases at Libby Dam to maintain 50° F with no more than a 3.6° F drop.	Provide conditions for normal migration and spawning behavior via a normalized thermograph.
Depth at Spawning Sites	Intermittent depths of 16.5 to 23 ft or greater in 60% of the area of rocky substrate from RM 152 to RM 157 during peak augmentation flows.	Provide conditions for normal migration and spawning behavior.
Substrate Extent/Spawning Structures	Approximately 5 miles of continuous rocky substrate; create conditions/features that improve the likelihood of recruitment success.	Provide habitat for embryo/free-embryo incubation and rearing.
Minimum Frequency of Occurrence	To facilitate meeting the attributes via: <u>powerhouse plus up to 10,000 cfs flow test</u>: a flow test will occur 2010 through 2012 (or until the Kootenai River Restoration Project is implemented) if the Service determines in 2008 and 2009 that the success criteria described in Action 1.3(b) have not been met. <u>Habitat improvement projects and other options</u>: through adaptive	

² In order to develop an agreed-upon estimate and measurement of the areal extent of the velocity and depth attributes, the Action Agencies shall, together with the Service and in collaboration with other involved parties as needed, develop appropriate assessment tools (e.g., hydrologic models) of the braided reach.

	management, as noted in RPA Components 2 and 5, implement the Kootenai River Restoration Project by the aspirational date of 2012-2016.	

Operation of Libby Dam for sturgeon flow augmentation and temperature management during 2008 may have influenced the timing, extent, and duration of sturgeon pre-spawning migration. Discharge temperatures during 2008 warmed later than usual and IDFG documented that one tagged sturgeon migrated further upstream than had been previously observed. The 2011 sturgeon pulse and thermograph will be managed to maximize the upstream migration of adults and to optimize conditions during the egg incubation and embryonic stages. Additional flows from spill will coincide with discharges through the powerhouse to ensure release temperatures can be sustained at or above 50° F at Bonners Ferry. The operation will attempt to avoid a sudden decline in temperature during the spawning and incubation phase.

The operating parameters outlined in this SOR are intended to provide some guidance on how to achieve the attributes listed in Table 1 of the 2006 USFWS BO, given the current water supply forecast. Previous years operations have shown that conditions at Libby Dam and in the Kootenai River basin can change rapidly. Recognizing this, the start date and exact shape of the operation will need to be developed and modified in-season as more is known. The in-season coordination will occur in the sturgeon technical team and with a final recommendation coordinated through the action agencies and the Technical Management Team.

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday May 18, 2011 9:00am - 12:00pm

Bonneville Power Administration
905 NE 11th AVE, Room 122
Portland OR 97208

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6845

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.

AGENDA

1. Welcome and Introductions
2. Review April 22, 27 and May 11 Meeting Minutes [\[Meeting Minutes\]](#)
3. Update on Water Supply Forecasts - Steve Barton, COE-NWD
 - a. [RFC Snow](#)
 - b. [Westwide SNOTEL](#)
4. Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows - Jason Flory, USFWS
 - a. [SOR 2011-FWS#1](#)
5. Libby Dam Operations - Steve Barton, COE-NWD and Joel Fenolio, COE-NWS
 - a. [Operations](#)
6. Dworshak Operations - Steve Barton, COE-NWD and Steve Hall, COE-NWW
7. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish

- c. Water Quality
 - i. [April TDG Instances Report](#)
- d. Power System
 - a. [Spring Forum](#)
 - b. [BPA's Interim Environmental Redispatch and Negative Pricing Policies](#)
- 8. Other
 - a. Set agenda and date for next meeting - **May 25, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

TDG INSTANCE TYPES

April 1 – April 30, 2011

Instances of when TDG levels exceed state water quality standards are classified into “types” which are shown on Table 1. These types are regionally approved and have been used since 2003. The states have requested information on TDG instances which include:

1. Date and times of exceedance
2. Amount of exceedance in percent saturation
3. Explain reason for exceedance
4. Discuss steps taken to fix the problem.

Because TDG instances are events when state TDG standards are exceeded, it is necessary to describe the current legal arrangement of how the state water quality standards are being implemented by the USACE. The March 24, 2011 Spring Operations Court Order requires the Corps to operate according to the 2006 fixed monitoring station (FMS) system, and the 2006 state water quality standards which is referred to as “Roll-Over”. Therefore, the Camas/Washougal FMS, and the Oregon high 12-hour average calculation method are used to manage spill.

During the spill for fish passage season from April through August the Washington Department of Ecology (WDOE) has issued a temporary %TDG Rule Adjustment to their current water quality standards and Oregon Department of Environmental Quality (ODEQ) issued a 5-year %TDG Waiver. The state water quality standards are calculated differently from one another, and also from the 2006 Roll-Over.

USACE is currently tracking and recording the current state water quality standards as follows.

Oregon: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/or/201104.html

Washington: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/wa/201104.html

Comparison of OR & WA: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/201104.html

Table 2 provides the TDG instances according to the Oregon high 12-hour average calculation method that occurred in the April 2011 spill for fish passage season.

Table 1

Types of Instance	
Type 1 Condition	TDG levels exceed the TDG standard due to exceeding powerhouse capacity at run-of-river projects resulting in spill above the BiOp fish spill levels. This condition type includes:
	• High runoff flows and flood control efforts. • BPA load requirements are lower than actual powerhouse capacity. • Involuntary spill at Mid Columbia River dams resulting in high TDG levels entering the lower Columbia River. • Involuntary spill at Snake River dams resulting in high TDG levels entering the lower Columbia River.
Type 1a Condition	Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.
Type 2 Exceedance	TDG exceedances due to the operation or mechanical failure of non-generating equipment. This exceedance type includes:
	• Flow deflectors unable to function for TDG abatement with tailwater elevations above 19 - 26 feet at Bonneville Dam. • Spill gates stuck in open position or inadvertently left open. • Increased spill in a bulk spill operation to pass debris. • Communication errors, such as teletype were transmitted but change was not timely made or misinterpretation of intent of teletype by Project operator.
Type 2a Exceedance	Malfunctioning FMS gauge, resulting in fewer TDG or temperature measurements when setting TDG spill caps.
Type 3 Exceedance	TDG exceedances due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This exceedance type includes:
	• Uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, and spill patterns. • Uncertainties when using the SYSTDG model to predict the effects of various hydro system operations, temperature, degassing, and travel time. • Uncertainties when using forecasts for flows, temperature and wind. • Unanticipated sharp rise in water temperature (a 1.5 degree F. or greater change in a day). • Bulk spill pattern being used which generated more TDG than expected.

Table 2
Types of TDG Instances
April 2011

DATE	Lower	Lower	Little	Little	Lower	Lower	Ice	Ice	McNary	McNary	John	John	The	The	Bonn	Bonn	Camas
	Granite	Granite	Goose	Goose	Monum.	Monum.	Harbor	Harbor			Day	Day	Dalles	Dalles			
	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrac	Forebay	Tailrac	Forebay	Tailrac	Forebay	Tailrac	Forebay
4/1/11	----	1	----	----	----	----	----	1	----	1	----	1	----	----	----	----	----
4/2/11	----	1	----	----	----	----	----	1	----	1	----	1	----	----	----	----	----
4/3/11	----	1	----	----	----	----	----	1	----	1	----	1	----	----	----	1	----
4/4/11	----		----	----	----	----	----		----	1	----	1	----	----	----	1	1
4/5/11	----	1	1	----	----	----	----	1	----	1	----	1	----	----	----	1	1
4/6/11	----	1	----	----	----	----	----	1	----	1	----	1	1	----	1	1	1
4/7/11	----	1	1	----	----	----	----		----	1	----		----	----	1	1	1
4/8/11	----	----	1	----	1	1	----	----	----	----	----	----	----	----	----	----	1
4/9/11	----	----	1	----	1	----	1	----	----	1	----	1	----	----	----	----	----
4/10/11	----	----	1	----	1	----	1	----	----	----	----	----	----	----	----	----	----
4/11/11	----	----	----	----	1	----	----	----	----	----	----	----	----	----	----	----	----
4/12/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	----	3
4/13/11	----	----	----	----	3	----	3	----	----	----	----	----	----	----	3	3	3
4/14/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/15/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/16/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	----	----
4/17/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/18/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/19/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/20/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	3	----
4/21/11	----	----	----	----	----	3	----	----	----	----	----	----	----	----	----	----	----
4/22/11	----	----	----	----	----	3	----	----	----	----	----	----	----	----	----	----	----
4/23/11	----	----	----	----	----	3	3	----	----	----	----	----	----	----	3	----	----
4/24/11	----	----	1	----	3	----	3	----	----	----	----	----	----	----	3	----	3
4/25/11	----	----	----	----	----	----	3	----	----	----	----	----	----	----	----	----	----
4/26/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/27/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/28/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/29/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
4/30/11	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
TOTAL	0	6	6	0	6	4	6	5	0	8	0	7	1	0	7	7	8
APRIL GRAND TOTAL = 71																	



US Army Corps of Engineers



Libby Dam Operations - Sturgeon SOR for TMT on May 18th



Joel Fenolio – Upper Columbia Senior Water
Manager
Seattle District - Water Management Section

5/17/2011



Libby Dam – Forecasts and BiOp Requirements

- The Corps 1-May forecast is 8165 KAF for the Apr-Aug Inflow Volume to Libby Dam
 - 139% of average
 - Forecast has an error bound of +or- 508 KAF
- 1-May Forecasts sets the following:
 - Sturgeon Volume to 1.2 MAF
 - Tiered Bull Trout Minimum to 9,000 cfs after the Sturgeon Pulse through 31-Aug



Sturgeon Operation

- Accounting will be against any flow above 4 kcfs once:
 - 8 degrees Celsius can be maintain at the dam and Bonners Ferry within 2 degrees Celsius
 - One F4 female is at Ambush Rock
- The target is to get Bonners Ferry Stage as close to 1764 ft as possible. Spill will be curtailed for flood risk reduction.



Sturgeon Operation – cont'd

- Ascending Limb:
 - If releases prior to the pulse < 15 kcfs
 - Ramp up to 15 kcfs for 3 days
 - 20 kcfs for 3 days
 - Powerhouse capacity for 3 days
 - Spill for 7 days
 - If releases are > 15 kcfs
 - Ramp up to 20 kcfs for 4 days
 - Powerhouse for 5 days
 - Spill for 7 days



Sturgeon Operation – cont'd

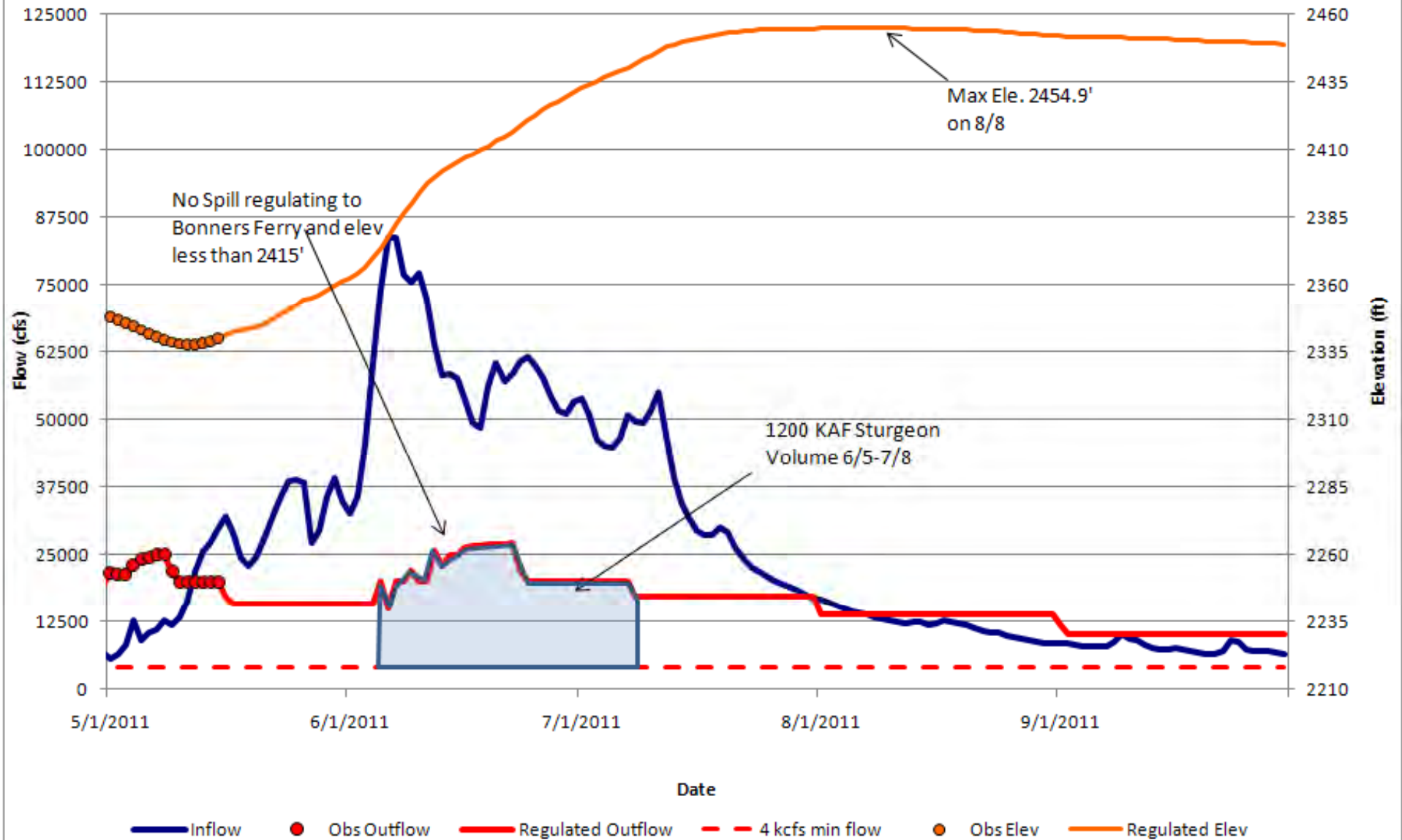
- Descending Limb:
 - After the peak hold powerhouse capacity for 4 days or extend to control refill
 - Depending of the summer flat slow to target 2449 ft of 30 Sep
 - 3 days at 20 kcfs or longer
 - 3 days at 17 kcfs or longer
 - 3 days at 15 kcfs or longer



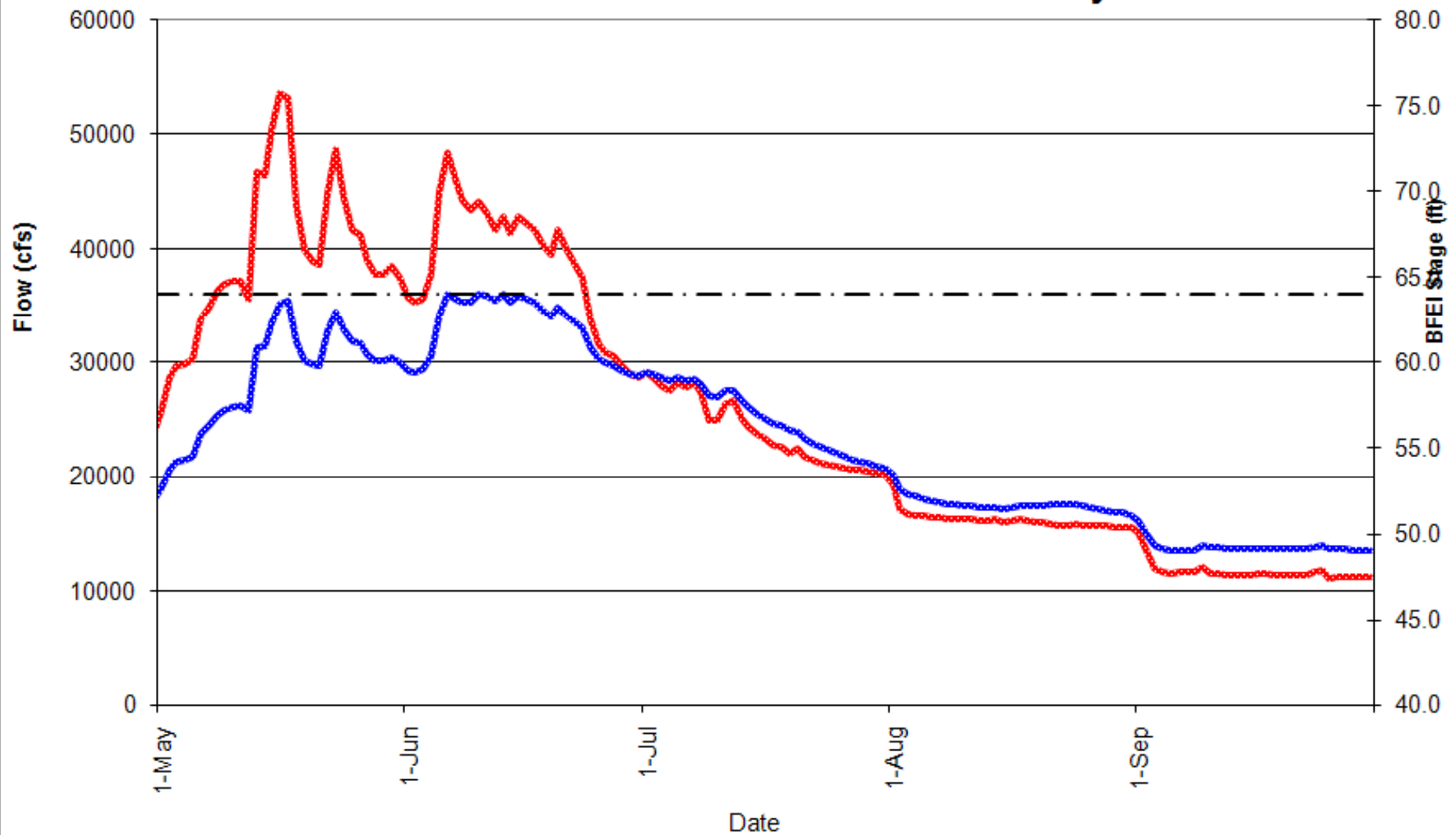
Libby Dam – Current Ops

- Releases ~16 kcfs through the 31-May and then re-evaluate based on conditions
- Currently all 5 units are available
 - The low head on the units is currently limiting flexibility with adjusting flows
- We are following the VarQ flood control procedure
- The next set of slides show median, high, and low operation scenarios using the River Forecast Center's ESP traces from May 3rd

Libby Operations WY 2011 **Based on the 1-May Forecast Volume of ~8200 KAF** **Inflows from ESP Traces on 16-May**

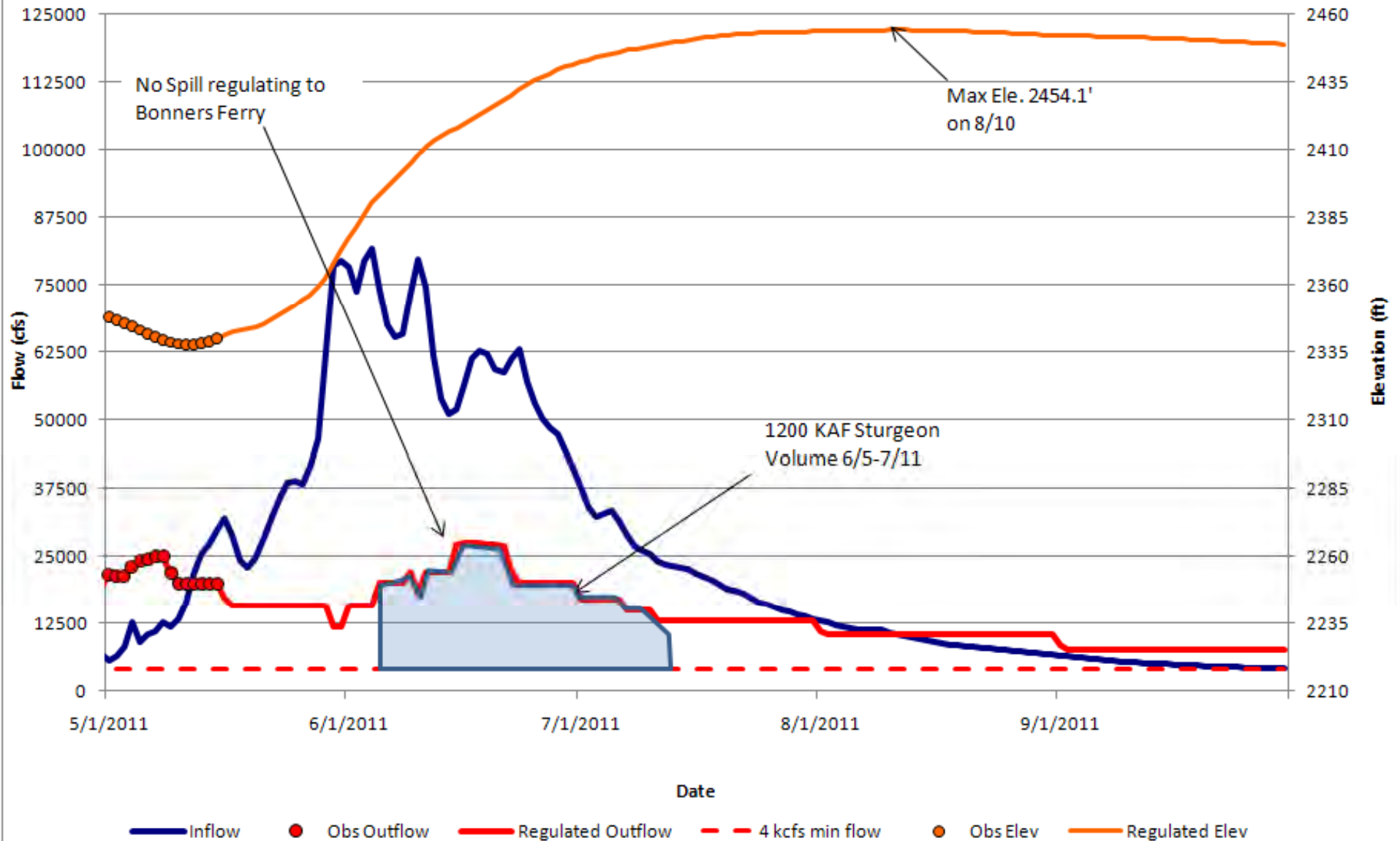


Bonnerr's Ferry WY 2011
Based on the 1-May Forecast Volume of ~8200 KAF
Inflows from ESP Traces on 16-May

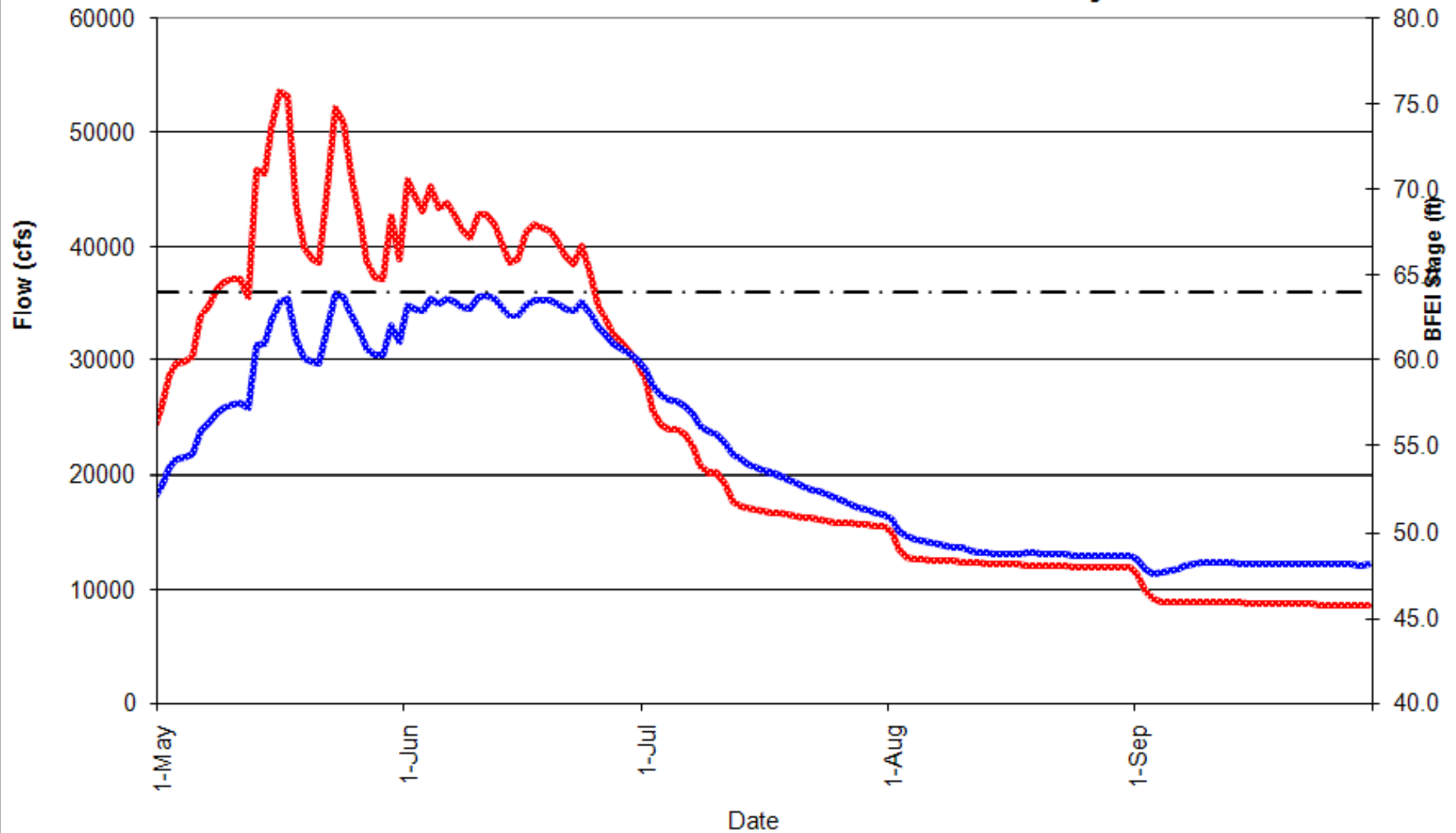


..... BFEI Regulated Flow cfs BFEI Regulated Stage ft - . - Flood Stage 64 ft

Libby Operations WY 2011 **Based on the 1-May Forecast Volume of ~7700 KAF** **Inflows from ESP Traces on 16-May**

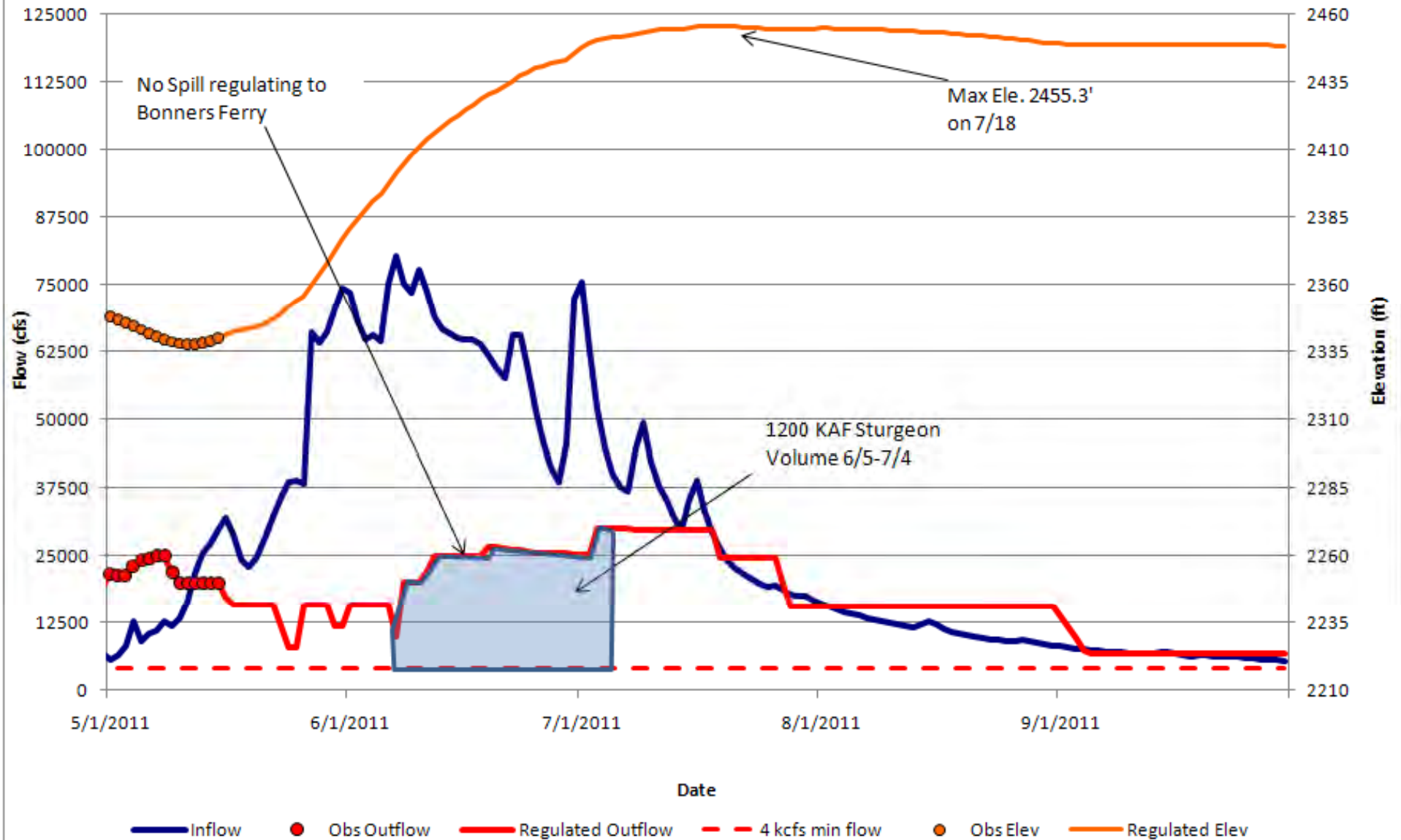


Bonnerr's Ferry WY 2011
Based on the 1-May Forecast Volume of ~7700 KAF
Inflows from ESP Traces on 16-May

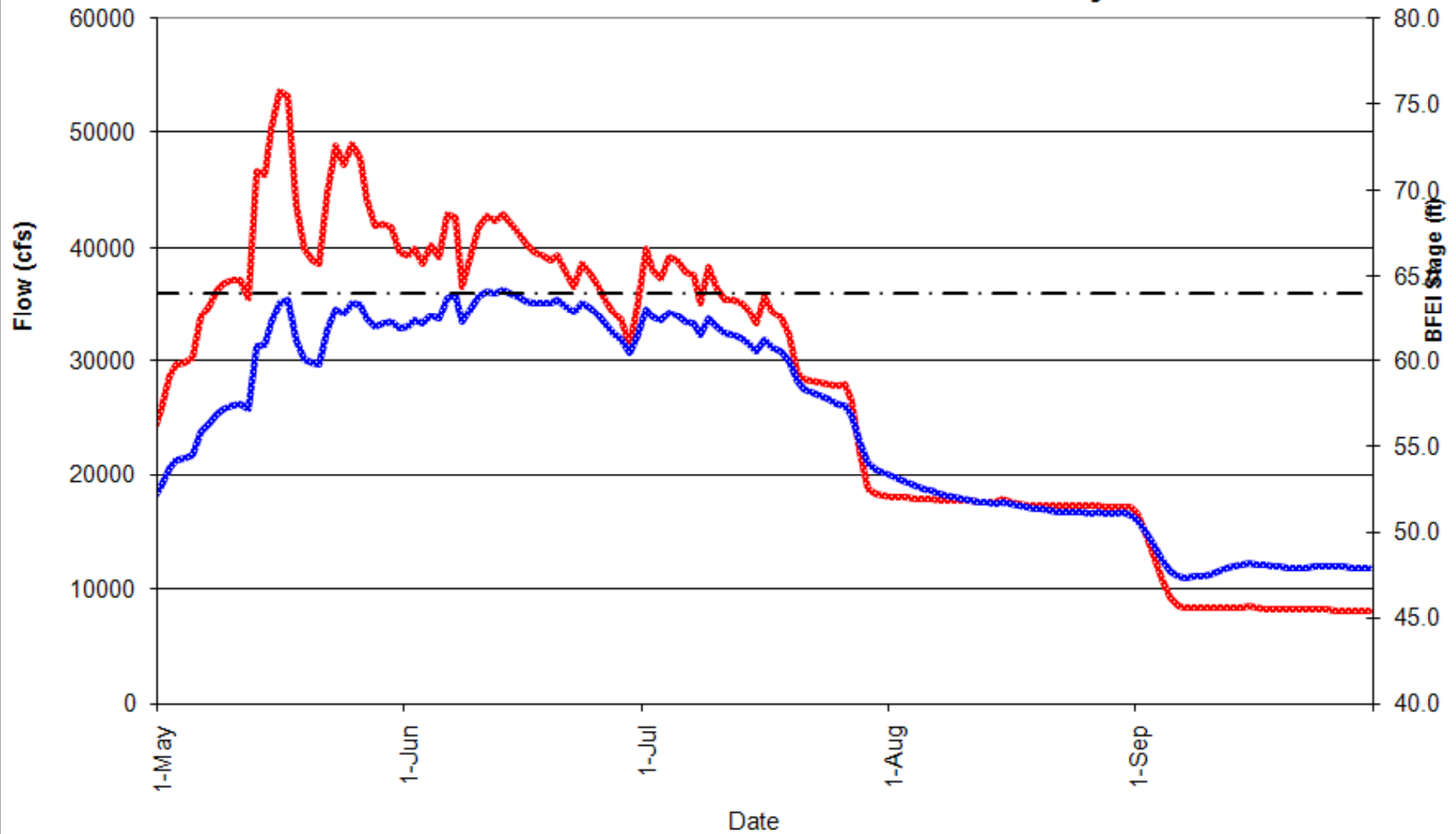


..... BFEI Regulated Flow cfs BFEI Regulated Stage ft - - - Flood Stage 64 ft

Libby Operations WY 2011 **Based on the 1-May Forecast Volume of ~8700 KAF** **Inflows from ESP Traces on 16-May**



Bonnerr's Ferry WY 2011
Based on the 1-May Forecast Volume of ~8700 KAF
Inflows from ESP Traces on 16-May



..... BFEI Regulated Flow cfs BFEI Regulated Stage ft - - - Flood Stage 64 ft



Summary

- The actual flow schedule may change due to conditions in the river and where the Sturgeon are located. Changes will be coordinated through the Sturgeon Flow Planning team.
- Most ESP scenarios show that unregulated flows could get Bonners Ferry to 1764 ft stage without spilling.
- Spill can be used as a tool to prop the Bonners Ferry Stage close or up to 1764 ft if the reservoir is at an elevation of 2415 ft or higher.

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

May 18, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Meeting Minutes

With no further edits suggested on the April 22, 27 and May 11 Official Meeting Minutes or Facilitator's Notes, they were considered final.

Update on Water Supply Forecasts

Steve Barton, COE, provided information from the May final forecast, noting that the mid-month due out tomorrow would likely show an upward trend in water supply from what was reported today. With that caveat, he shared the data:

- RFC Snow report showed at or above normal snow conditions in the basin, with the northern basin showing snow above the observed maximum. Accumulation has continued in to May, whereas past years experienced peak accumulation in April. The Westside SNOTEL reported above normal snow throughout the entire basin.
- The May Final Water Supply Forecasts:
 - o Grand Coulee – 75.1 MAF (117% of normal)
 - o Lower Granite – 28.4 MAF (132%)
 - o The Dalles – 113 MAF (121%)
 - o Dworshak – 3.77 MAF (143%)
 - o Libby – 8.16 MAF (140%)
 - o System wide – within a ½ foot flood stage at Vancouver; reservoirs are filling

SOR 2011-FWS#1

Jason Flory, USFWS, described this year's request for operations to support sturgeon releases and bull trout. Using the latest May final forecast per settlement agreement and resulting RPA in the BiOp, this year falls in to Tier 5 operations and has a 1.2 MAF sturgeon volume and is the second year of a three-year spill test. The entities that coordinated the request (COE, BPA, Montana, Idaho, Kootenai Tribe and USFWS) recognized that this year's water supply might require operating to flood control and acknowledged this would supersede the spill operation proposed. Given this, the SOR outlined options for an operation with spill, and an operation without. Jason suggested that the naturally high flows would likely provide a good test of the role higher flows play in sturgeon migration and spawning behavior. If these conditions are already present prior to the start of sturgeon operations, the “no spill” option in the SOR would be

preferred; the ‘descending limb’ of the operation, toward bull trout minimums, would depend on conditions and need to be further coordinated.

TMT members were polled for their level of support on the proposed operation:

- Idaho – supports the operation as it provides the best conditions for the sturgeon
- Washington – no objection, looks forward to seeing the report on the results of the operation next year
- Montana – supports the SOR – and wants the operation to stay within TDG limits per the Settlement Agreement
- CTUIR – no objection – defer to the action agencies to determine the best operation
- Nez Perce – no objection
- NOAA – supports the operation
- USFWS – supports the operation
- BPA – supports the operation
- BOR – supports the operation
- COE – supports the operation

Libby Operations

Joel Fenolio, Seattle District COE, shared information and graphs outlining summer Libby operations to support sturgeon and bull trout minimums. The COE planned to shape the sturgeon operation to front load outflows this year given the water supply. Summer flat flows/water conditions, he said, would determine the shape of the descending limb. Accounting against the Sturgeon Volume will begin once the temperature trigger and an F4 female is in the area of Ambush Rock. The accounting trigger was concurred by Jason Flory. Libby is currently releasing at 16 kcfs outflows the plan is to re-evaluate the flows every week and will change depending on Bonners Ferry Stage and if the Sturgeon Operation calls for higher flows.

Joel also shared graphs using ESP traces from 5/16 showing ‘median’, ‘high’ and ‘low’ volume operating scenarios.

Operating decisions, Joel said, will be coordinated with the Sturgeon Flow Planning Team and TMT.

Dworshak Operations Update

Gunnar Leffler and Steve Hall, Walla Walla District COE, updated TMT on Dworshak operations. The project was at elevation 1493’, filling about 2-3 feet per day, and currently releasing 2.5 kcfs. Outflows might increase over the next couple weeks to accommodate runoff. Steve said the COE was currently targeting an end of June refill date, but residual runoff volumes, June inflows and snow covered area will factor in to the refill operation. A snow flight in mid-June will be conducted to inform the amount of snow left in the basin at that time. He also noted that there is a local group who will likely recommend holding the project at full for about a week if feasible. TDG and local flood control will drive decisions.

Russ Kiefer, Idaho, commended TMT on their successful efforts to provide flow operations from Dworshak to support the spring migration – the operation was effective and in hindsight, had no impact on summer refill. In response to a question, the COE also shared that flow targets below Dworshak are variable, but given that the Mainstem was running so high, any flow requirements would have little impact on Dworshak operations.

Operations Review

Reservoirs – John Roache reported on Reclamation projects. Hungry Horse was at elevation 3481.46’ and filling, with 8 kcfs outflows. The project is expected to be operated this year to support local flood control at Columbia Falls. Grand Coulee was at elevation 1224’, and refilling. This project was being operated to control flows in the Mainstem. Steve Barton reported on COE projects. Libby was filling, with 32 kcfs in and 16 kcfs out, currently at elevation 2343.3’. Albeni Falls was on ‘free flow’, with 99.3 kcfs in and 67.7 kcfs out; the project was at elevation 2057.9’. Dworshak was at elevation 1491.8’ and rising, with 2.5 kcfs out and 27.3 kcfs in. Lower Granite day average flows were 188.7 kcfs (134.8 weekly average); the project was operating at MOP – Steve noted that if flows go much above 200 kcfs, the project might need to draft below 733’ elevation for flood control. Priest Rapids day average outflows were 215.5 kcfs (197.1 kcfs weekly average); McNary day average flows were 437.8 kcfs (328.4 kcfs week average); and Bonneville day average flows were 447.5 kcfs (338.1 week average). Due to the high flows, transportation operations at Lower Granite and Lower Monumental had been suspended. FPOM would be notified when transportation was resumed.

Fish – Paul Wagner, NOAA, shared a fish update. Adult spring Chinook counts were 154,000, with 1,788 per day passing Bonneville. Lower Granite saw 346/day. Paul noted that there appeared to be a slowing in passage, likely due to the high flows. Run timing was late but appears to have peaked. Jack counts were very high. Yearling Chinook at Lower Granite were ranging 100,000-200,000 per day, as were steelhead counts. Lamprey counts at Lower Granite were 200-600/day in recent days, and about 200-1,000 at Little Goose.

Paul also reported that weekly Chinook descaling went up to 5.7% at Lower Granite, and, of real concern, up to 11.8% at Bonneville. Sockeye descaling was up to 50%. FPOM had a scheduled call later today to discuss options for addressing the issue, and would explore the possibility of screen removal. Gas bubble trauma was being monitored and, so far, no problems had come up.

Doug Baus, COE, reported on an incident at Little Goose on 5/12 – 70 mortalities were caused by an operating oversight during a transportation transition. The oversight was corrected.

Water quality – Scott English, COE, shared a TDG report for April and exceedance table for May.

The salmon managers proposed a change to the spill priority list as follows:

- Lower Monumental

- Little Goose
- McNary
- Ice Harbor
- Lower Granite
- The Dalles
- John Day
- Bonneville

Action: With no objections, the COE planned to issue a teletype and implement the above change to the spill priority list later today (5/18).

Power system – Tony Norris, BPA, reported that BPA issued interim Environmental Redispatch and negative pricing policy on 5/13, and implemented it for a 5-hour period on 5/17. The re-dispatch was put in place to manage TDG during this period of high flows. The decision/report was linked to the agenda. The report read: ‘Under Environmental Redispatch, BPA will temporarily substitute renewable, carbon-free hydropower for other generation when necessary to ensure FCRPS operations are consistent with BPA’s environmental, statutory, and reliability responsibilities. During an Environmental Redispatch, utilities and consumers who purchase wind power or other energy would continue to receive the full energy deliveries associated with their transmission schedules, but the energy would originate from the FCRPS instead of other resources.’

For those interested in hearing more, BPA’s Spring Forum, scheduled for Friday 5/20 from 1-2 pm, would discuss this issue. The call-in information was linked to BPA’s website, and also linked to the TMT agenda.

Next Meeting, 5/25 (Conference Call): Placeholder as Needed to Discuss Operations Updates

Next Face to Face Meeting, 6/1

The agenda will be developed over the next week. Suggested agenda items should be shared with Steve Barton, Doug Baus or Robin Gumpert.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 18, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, Idaho, Washington, NOAA, BOR, BPA, USFWS, Montana and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Questions or comments should be directed to the TMT chair.

2. Review April 22, 27 and May 11 Meeting Minutes

There were no comments today on any of these facilitator notes or minutes. No one needed more time to comment so all were deemed final.

3. Update on Water Supply Forecasts

The RFC final forecast was released on May 6 and the mid-month forecast will be released tomorrow, Barton said. There are indications that the water supply forecast has been and will continue to trend upward.

Snowpack. Data from RFC snow sites and Westside SNOTEL sites show record-setting levels of snowpack at high and mid-level elevations. Normally snowpack stops accumulating in mid to late April, but this year snow was accumulating until last week. Many sites have exceeded their maximum snow-water equivalents for this time of year.

Water supply. RFC final forecasts for May are high everywhere:

- Grand Coulee – 75.1 maf, 117% of normal
- Lower Granite (April-July) – 28.4 maf, 132% of normal
- The Dalles (April-August) – 113 maf, 121% of normal
- Dworshak – 3.77 maf, 143% of normal
- Libby – 8.1 maf, 140% of normal

The Columbia is within a half foot of flood stage at Vancouver, which is projected to continue for the next 7-10 days, Barton said. The ICF date has passed and all storage reservoirs are filling now while operating for flood control. The COE will continue to monitor this situation closely and keep TMT informed.

4. Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows – SOR 2011-FWS#1

The May final forecast of 8.1 maf for Libby puts us in a tier 5 year under the 2006 USFWS BiOp for sturgeon, Jason Flory, USFWS, reported. Also, Libby is the second of three years of spill testing called for under the 2008 settlement agreement. With the late runoff and large water supply coming, odds are that conditions needed for the test are likely to occur on their own without spilling. Therefore this year's SOR for sturgeon has two scenarios, with and without spill.

The spill scenario has the same ramp up on the ascending limb as last year, assuming flows are above 20 kcfs: 15 kcfs for 3 days, 20 kcfs for 3 days, and full powerhouse for 3 days, followed by spill for 7 days and flat flows in summer on the gradually descending limb of the hydrograph. The no-spill scenario shows stable or gradually declining discharges through the end of September, followed by bull trout minimum flows of 9 kcfs.

While last year's spill test didn't create river conditions that hadn't been seen before due to low water supply, it looks like the high flows and turbidity this year will provide ideal conditions for testing all factors that affect sturgeon migration and spawning behavior.

David Wills, USFWS, asked whether there was consensus regarding the SOR submitted on behalf of the Libby BiOp policy group; Flory said there was. The BiOp policy group includes representation from the COE, BPA, Montana, Idaho, USFWS, the Kootenai tribe, and soon NOAA.

Dave Statler, Nez Perce Tribe, asked whether there are elevation targets for Libby associated with this operation. Flood control superseded them, said Joel Fenolio, COE Seattle. He didn't expect any problem meeting elevation 1,764 feet for the sturgeon operation. Jim Litchfield said Montana would support the SOR as long as TDG conditions in the settlement are maintained if the river goes into voluntary spill; Flory said absolutely.

Idaho, Washington, Montana, the Umatilla and Nez Perce tribes, NOAA, USFWS, BPA, BOR and the COE all expressed unanimous support for the SOR. Oregon was not present today.

5. Libby Dam Operations

This year's plentiful water supplies mean VARQ flows aren't a consideration at Libby, Fenolio reported. The COE forecast for Libby of 8.1 maf could go as high as 9 maf. The May forecast includes two BiOp requirements, the 1.2 maf of sturgeon volume followed by the tiered bulltrout minimum that starts when the sturgeon pulse ends and continues through August 31. The target at Bonners Ferry Stage is as close to 1,764 feet as possible.

Fenolio described the sturgeon operation Jason Flory presented in the SOR earlier today. If releases are greater than 15 kcfs prior to the sturgeon

operation, the ramp up will be to 20 kcfs for 4 days, powerhouse for 5 days and spill for 7 days. The descending limb would be powerhouse flows for the balance of 14 days on the peak or longer as needed to control refill, then regulating to 20, 17 and 15 kcfs depending on summer flat flows. The volume will depend on whether the goal is to control refill or reach 2,449 feet on September 30.

The current Libby operation is 16 kcfs out as of May 16. However, only about 65-70% of that can pass through Kootenai Lake due to natural restrictions on hydraulic capacity caused by a backwater effect at Grohmann Narrows. VARQ flows of 12.1 kcfs have been superseded by flood control. All 5 units will be available for most of the summer. The sturgeon operation could start next week depending on temperature criteria and sturgeon behavior. The assumption in the projected operations using the May 16th ESP traces is to start the sturgeon operation on June 5. The refill goal after the sturgeon operations is to control the reservoir elevation, which will peak at 2,454 feet or 5 feet from full.

Fenolio showed TMT several scenarios based on a May 1 forecast of 8.2 maf, 7.7 maf or 8.7 maf. The low forecast scenario calls for 16 kcfs releases, ramping down for Bonners Ferry regulation toward the end of May. The high scenario calls for regulating the reservoir for refill toward the end of June or early July with no spill for sturgeon. This scenario calls for flows of 20 kcfs for 4 days, then the reservoir would be almost full and spilling in July. In all scenarios, Bonners Ferry Stage reaches the target elevation 1,764 feet using full powerhouse capacity. In summary, most ESP traces show unregulated flows could help Bonners Ferry reach 1,764 feet without spilling. TMT will check back in on this operation in late June or early July on the descending limb of the sturgeon pulse.

6. Dworshak Operations

Inflows at Dworshak reached 35 kcfs a few days ago. The project is at 1,493 feet and filling rapidly by 2-3 feet per day, Steve Hall, COE Walla Walla, reported. That rate of refill is expected to continue for awhile. Discharges are 2.5 kcfs and the COE is considering bumping that up slightly over the next few weeks. Overall, the operation is going well.

Statler asked about the projected date of refill. The plan is to fill by the end of June, but that will be constrained by residual runoff and the possible need for extra space as protection against high inflows, Hall said. The COE will also be constrained by the amount of snow in the basin. There will be a snow flight in mid to late June to determine whether the reservoir can refill by the end of June, as the COE aims to do. Generally the COE tries to fill the reservoir when inflows drop below powerhouse capacity, due to TDG concerns. Statler asked whether the 5 feet of space that could be needed by the end of June for flooding concerns is for TDG or flood control. It's both, Hall replied. The COE will monitor this

closely. Barton reminded everyone that flood control will always supersede the TDG standards.

Charles Morrill asked about projected inflows over the next week; Hall said 20-30 kcfs over the next 10 days is likely. Yesterday inflows dropped to around 20 kcfs. Russ Kiefer, Idaho, noted that the Dworshak augmentation in late April/early May was a good use of water for fish. Statler asked whether 80-85 kcfs is still the flood control target at the confluence of the north fork of the Clearwater; Hall said there's little the COE can do with the mainstem running high. TMT will revisit Dworshak operations at its June 1 meeting.

7. Operations Review

a. Reservoirs. Hungry Horse is at elevation 3,481.46 feet with 8 kcfs releases and starting to fill. It drafted to a low elevation of 3,471 feet and refilled by about 10 feet over the past week. Inflows are now 20 kcfs after peaking at 24 kcfs. There is still a lot of high elevation snowpack in the basin.

Grand Coulee is at elevation 1,224 feet and starting to refill. It was held at a flood control elevation of 1,220 feet until May 16. Libby, not at 2,343.3 feet, drafted to a bottom flood control elevation of 2,337 feet last week and is filling now. Inflows spiked at 40 kcfs and are still elevated at 33.2 kcfs. Outflows are 16 kcfs.

Albeni Falls inflows peaked at 100 kcfs and the project is on free flows. Outflows are 67.7 kcfs, and the project elevation is 2,057.9 feet. Dworshak is releasing 2.5 kcfs with inflows of 27.3 kcfs. Project elevation is 1,491.8 feet and rising.

Lower Granite is releasing 188.7 kcfs, up from last week's average of 134.8 kcfs. The seasonal average is 108.9 kcfs. The project is operating in the 733-734 foot range. If inflows rise to 200 kcfs, Lower Granite might need to draft below 733 feet to protect Lewiston from flooding. TMT will be notified if that happens. The lowest possible project elevation is 728 feet. Barton noted that transportation has been suspended at both Lower Granite and Lower Monumental because of high flows.

Priest Rapids is releasing 215.5 kcfs, up from last week's average of 197.1 kcfs. The seasonal average is 162.5 kcfs. McNary is releasing 437.8 kcfs; last week's average was 328.4 kcfs. Bonneville is releasing 447.5 kcfs, with a prior week's average of 338.1 kcfs. Operations are now dictated by maintaining the lower Columbia within the 1-1.5 foot flood stage at Vancouver. Statler asked whether flows on the lower Columbia are setting a record. Barton said he didn't think so, but he could respond to that inquiry more definitively at the next TMT meeting.

b. Fish. Adults: The spring chinook run has been good this year, with 154,000 adults passing Bonneville to date, Paul Wagner, NOAA, reported. Yesterday 1,788 fish passed the dam, but as many as 10,000 per day were seen over the past week. Wagner noted that fish tend to stop moving when flows and TDG levels are high. The run seems to be trailing off, but it's not clear whether that is due to flows or the actual end of the run. Spring chinook jack counts are high, although not as high as in 2009.

Juveniles: Yearling chinook passage isn't being monitored because all the traps have been pulled due to high flows and debris. Passage index counts at Lower Granite have been steadily in the range of 100,000-200,000 fish per day. At Lower Monumental it's 200,000 per day; at John Day 155,000 per day. Juvenile passage season may have peaked on the Snake within the past week, and it's prime time now on the lower river. Approximately 9 million yearling chinook (both marked and unmarked) have passed Lower Granite.

Steelhead were passing Lower Granite at the rate of 200,000 per day a week ago and are still passing steadily. Lower Monumental has been passing 100,000 per day and John Day, 130,000 per day. Steelhead passage (both marked and unmarked) at Lower Granite is leveling out now. Passage of 9 million steelhead to date puts this year in the middle range of years.

Lamprey numbers this year unfortunately were not good. Lower Granite passed 600 lamprey. On the lower river, 3,000 lamprey per day at John Day was the high for the season. Lamprey passage numbers at Bonneville were not great.

The high flows are bringing with them loads of debris, which can lead to descaling of fish. Descaling rates are 5.7% at Lower Granite for chinook and 5% for steelhead. At Little Goose 1.4% of yearling chinook and 0.9% of steelhead were descaled. A site of concern is McNary Dam, where 3% of yearling chinook and 2-7% of steelhead were descaled. Sockeye descaling rates are very high at 15%. Bonneville is the location of highest concern, with 7-9% of steelhead and 11.8% of Chinook being descaled. Wagner said FPOM will discuss the debris situation at Bonneville this afternoon.

Dave Wills, USFWS, reported that the final Spring Creek Hatchery release went well. Wagner reported that GBT signs are being monitored, but as of May 16, GBT incidence was very minimal.

Doug Baus, COE, notified TMT that on May 12 at 3 am, there were 70 mortalities of yearling chinook at Little Goose due to an error that occurred while loading them onto a barge.

c. Power. On May 13, the BPA Administrator signed the ROD for environmental redispach and negative pricing, Tony Norris, BPA, reported. The 92-page ROD is available on the BPA website. Also BPA has been hosting

conference calls to discuss spring operations every Friday from 1-2 pm. Details are available on the BPA calendar, accessible through the newsroom tab on the BPA site. Since the ROD went into effect, wind generation was taken off line for 5 hours on May 18. Currently 3,522 MW of wind capacity is installed within BPA's balancing authority area.

d. Water Quality. Russ Kiefer, Idaho, reported that the Salmon Managers caucused and decided to propose a change in the spill priority list. They recommended moving Lower Monumental to first place, followed by Little Goose, McNary, Ice Harbor, Lower Granite, The Dalles, John Day and Bonneville in that order. With Little Goose day and night spill next to each other in terms of priority, the COE will merge them and drop the day/night distinction, Barton said.

The COE, BOR and BPA voiced no objection to the Salmon Managers' recommendation. The COE will implement the spill priority list as recommended by the Salmon Managers.

7. Next Meeting

A tentative TMT call was scheduled on May 25. The next regular meeting in person will be on June 1.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Russ Kiefer	Idaho
Charles Morrill	Washington
Paul Wagner	NOAA
Adam Price	COE
Joel Fenolio	COE Seattle
John Roache	BOR
Dale Lindeman	BOR
Tony Norris	BPA
Scott Bettin	BPA
David Wills	USFWS
Lisa Wright	BPA
Doug Baus	COE
Scott English	COE
Linda Jackson	XX
Dave Statler	Nez Perce
Tom Lorz	CRITFC/Umatilla

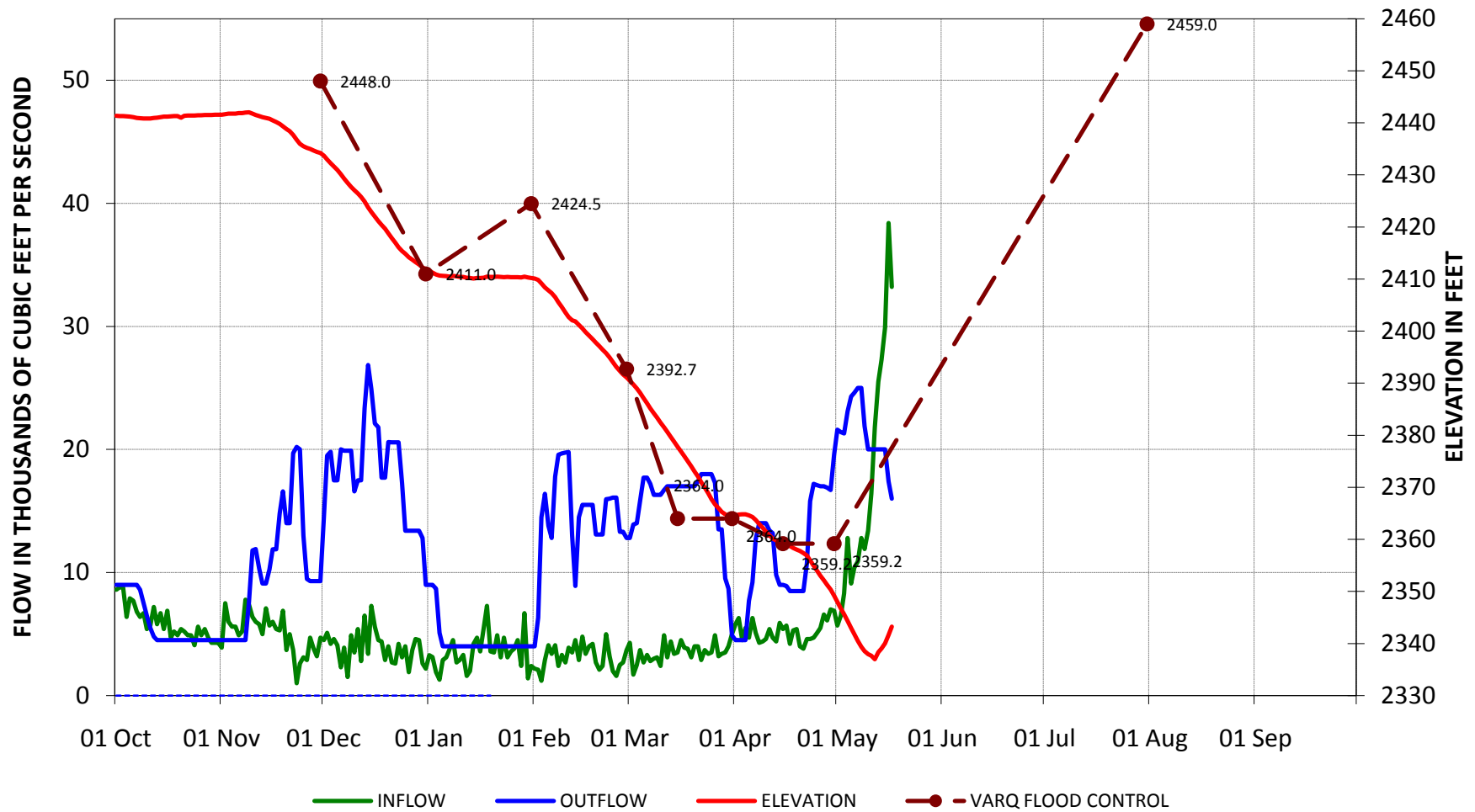
Phone:

Jim Litchfield	Montana
Kim Johnson	COE
Jason Flory	USFWS
Gunnar Leffler	COE Walla Walla

Barry Espenson	CBB
Russ George	WMC
Shane Scott	PPC
Dave Benner	FPC
Richelle Beck	DRA
Bruce McKay	consultant
Rob Allerman	Deutsch Bank
Mike Shapley	Snohomish PUD
Tom Le	Puget Sound Energy
Doug Vine	Thompson Reuters
Bill Rudolph	NW Fish Letter
Steve Hall	COE Walla Walla
Tara Kelly	JP Morgan
Tim Heizenrader	Centaurus

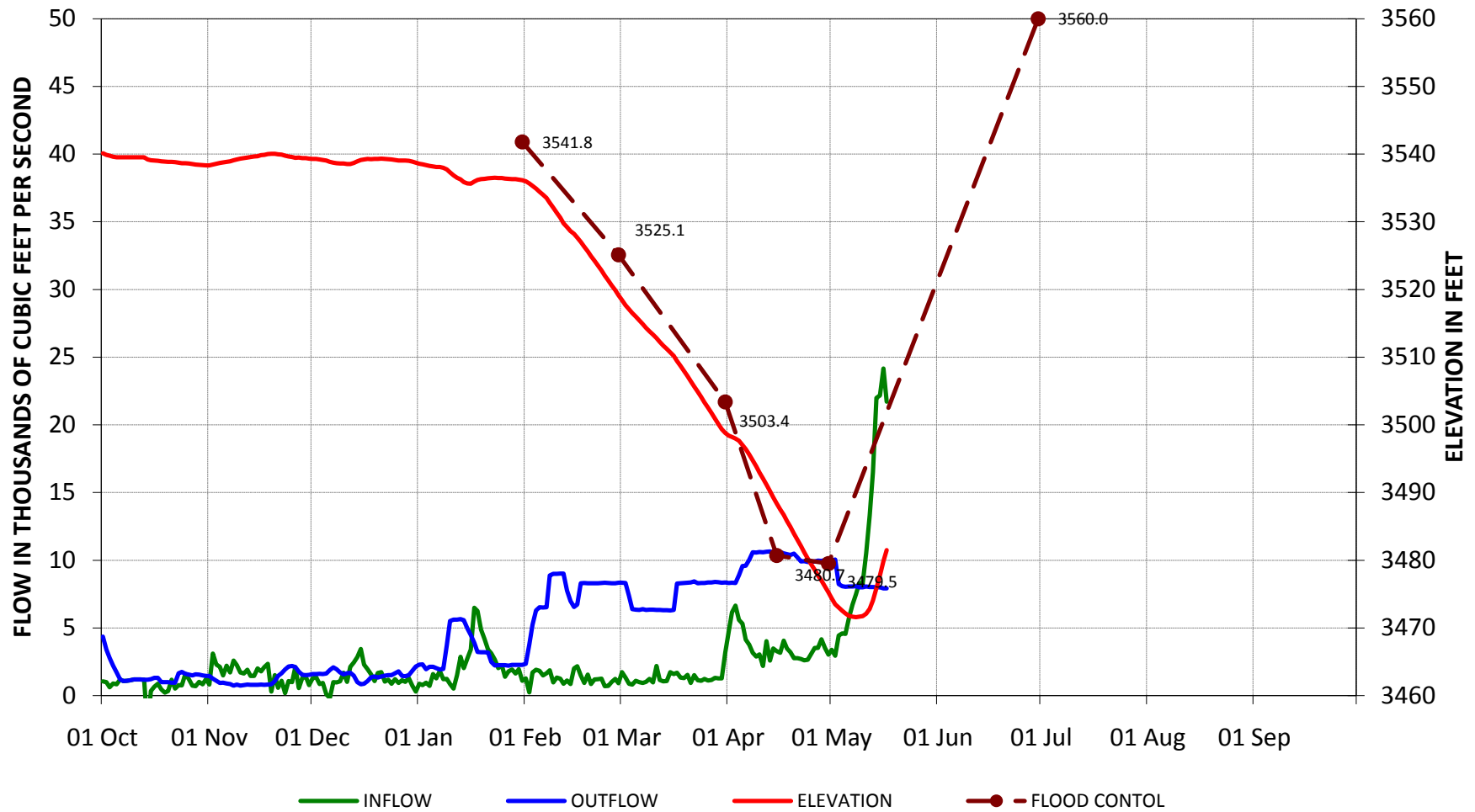
LIBBY DAM AND RESERVOIR

Water Year 2011



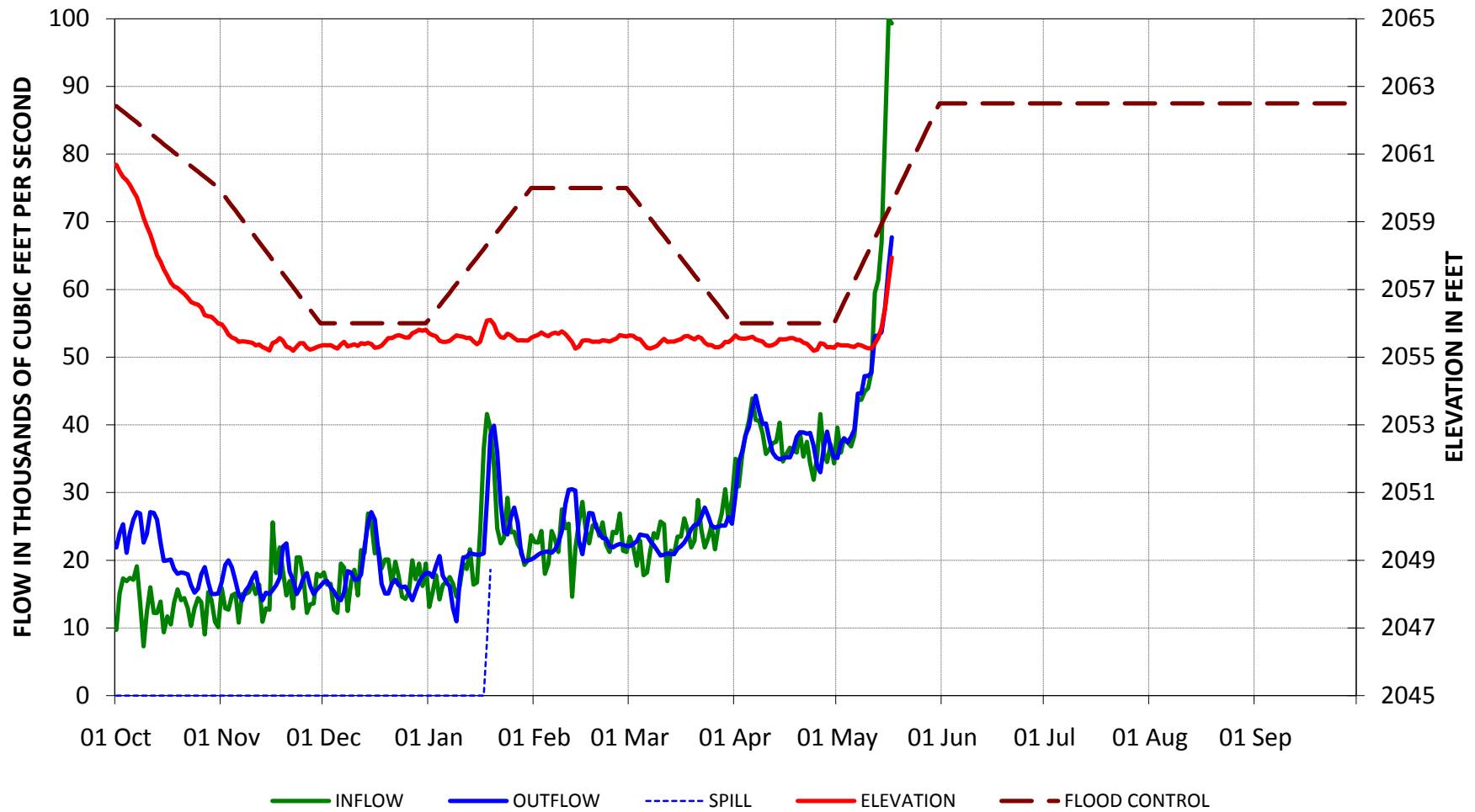
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



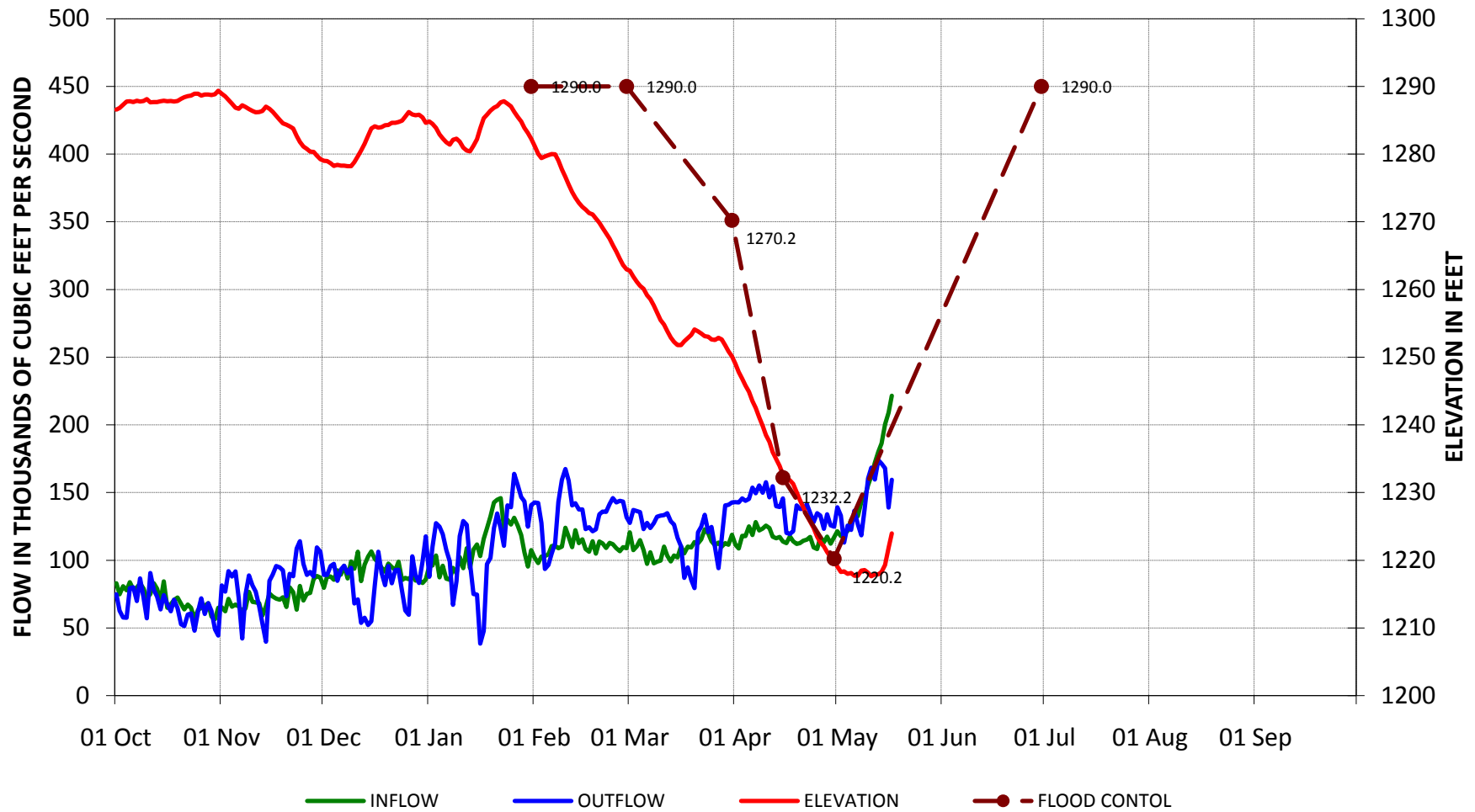
ALBENI FALLS DAM AND RESERVOIR

Water Year 2011



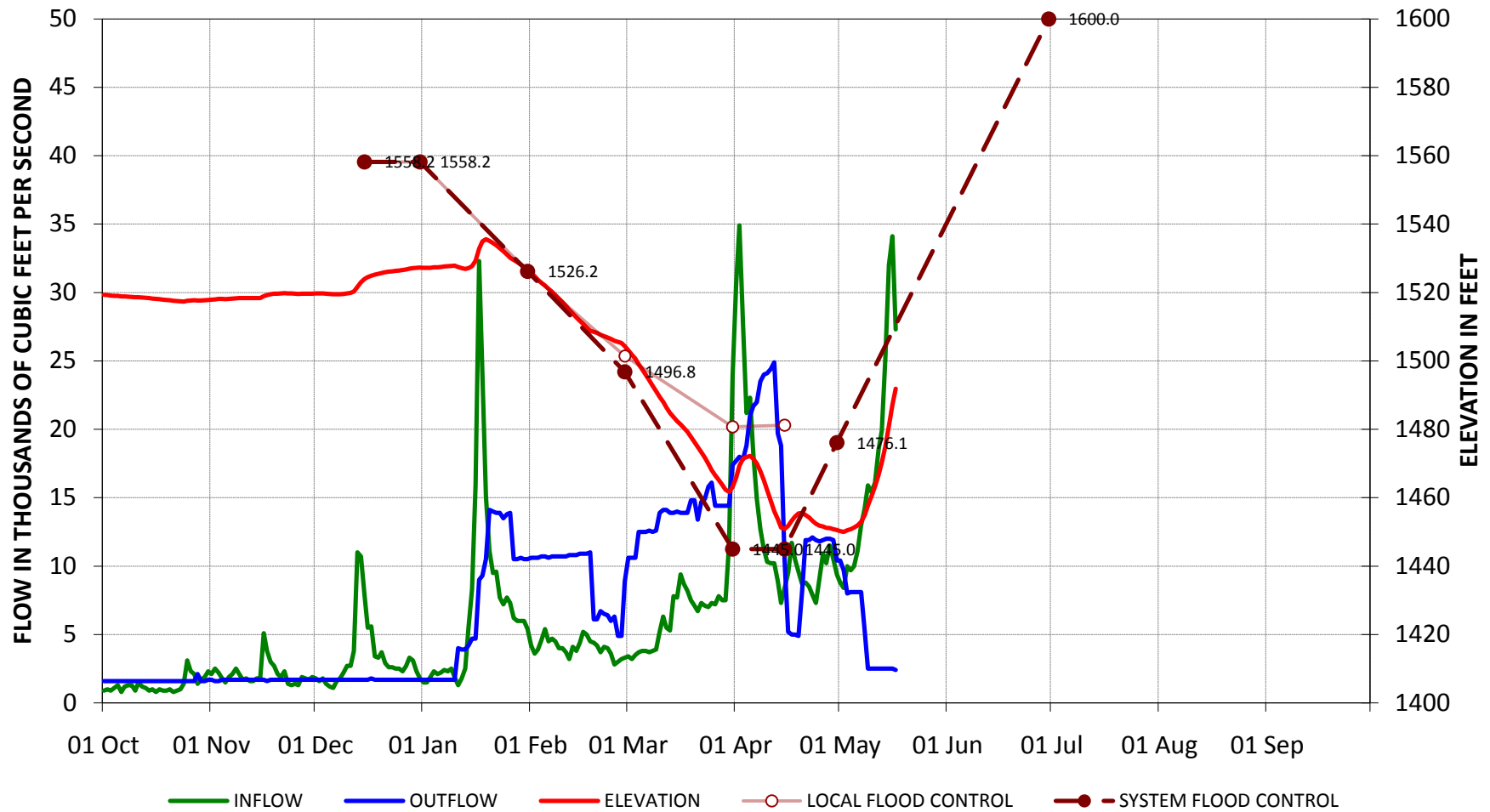
GRAND COULEE DAM AND RESERVOIR

Water Year 2011

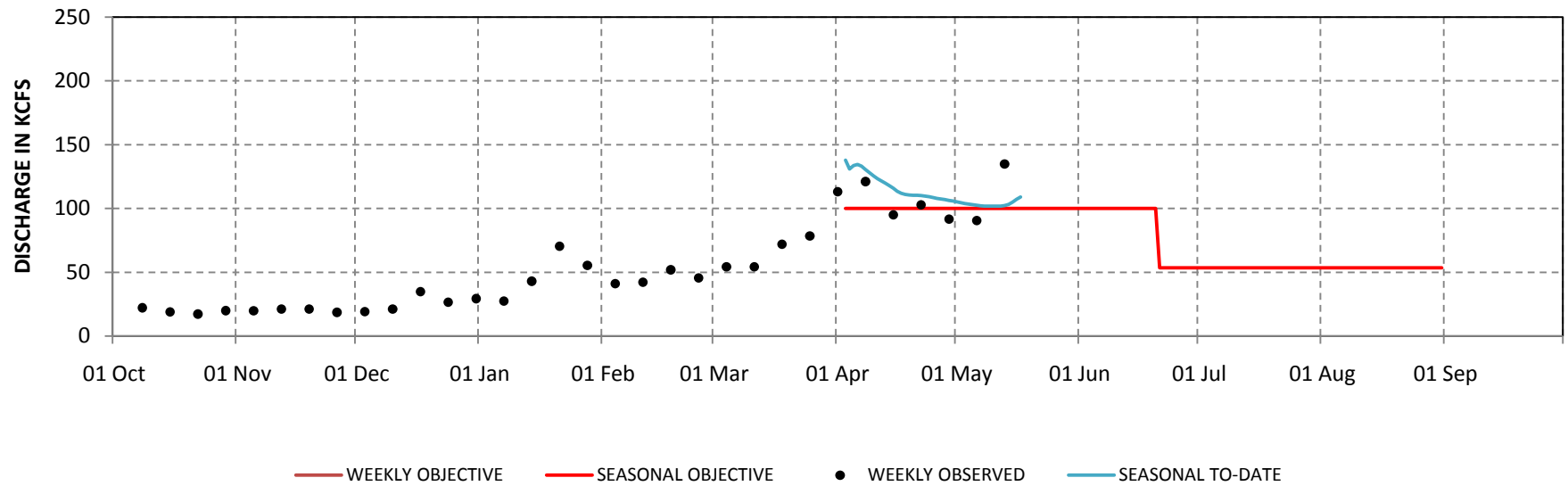


DWORSHAK DAM AND RESERVOIR

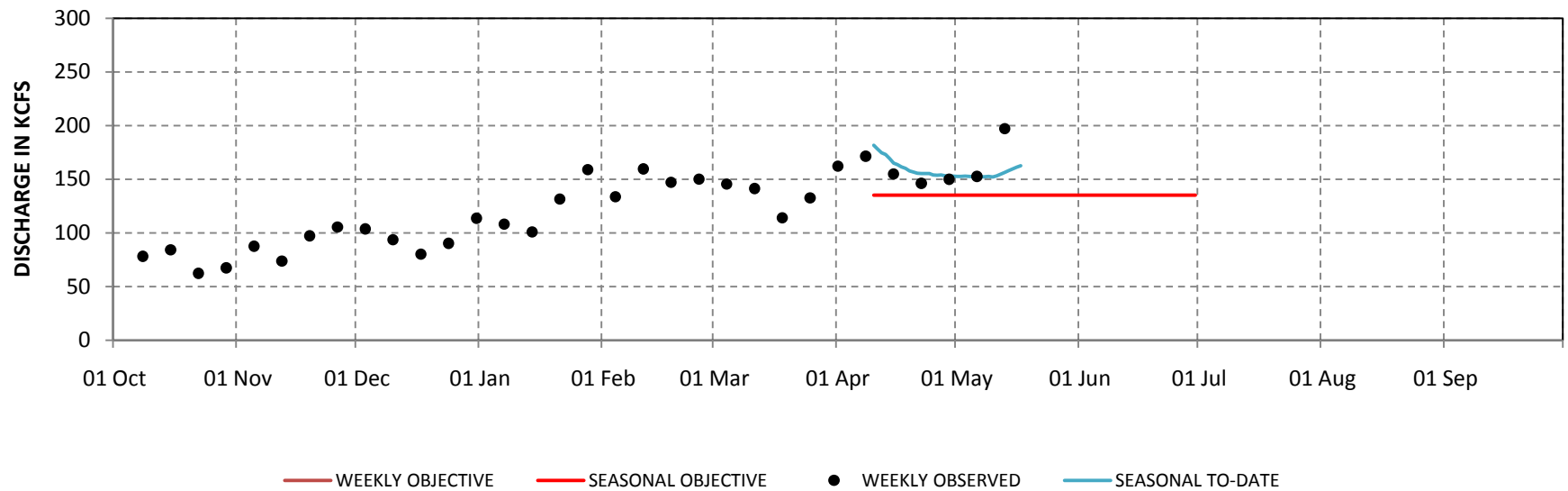
Water Year 2011



PROJECT DISCHARGE SUMMARY SNAKE RIVER AT LOWER GRANITE DAM

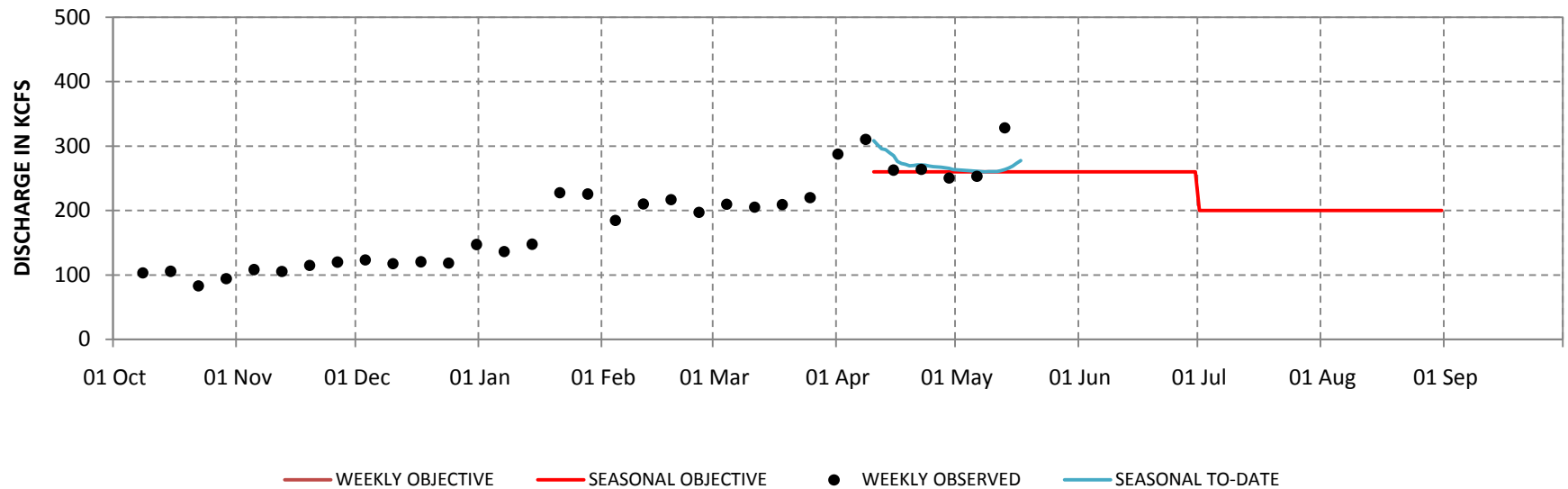
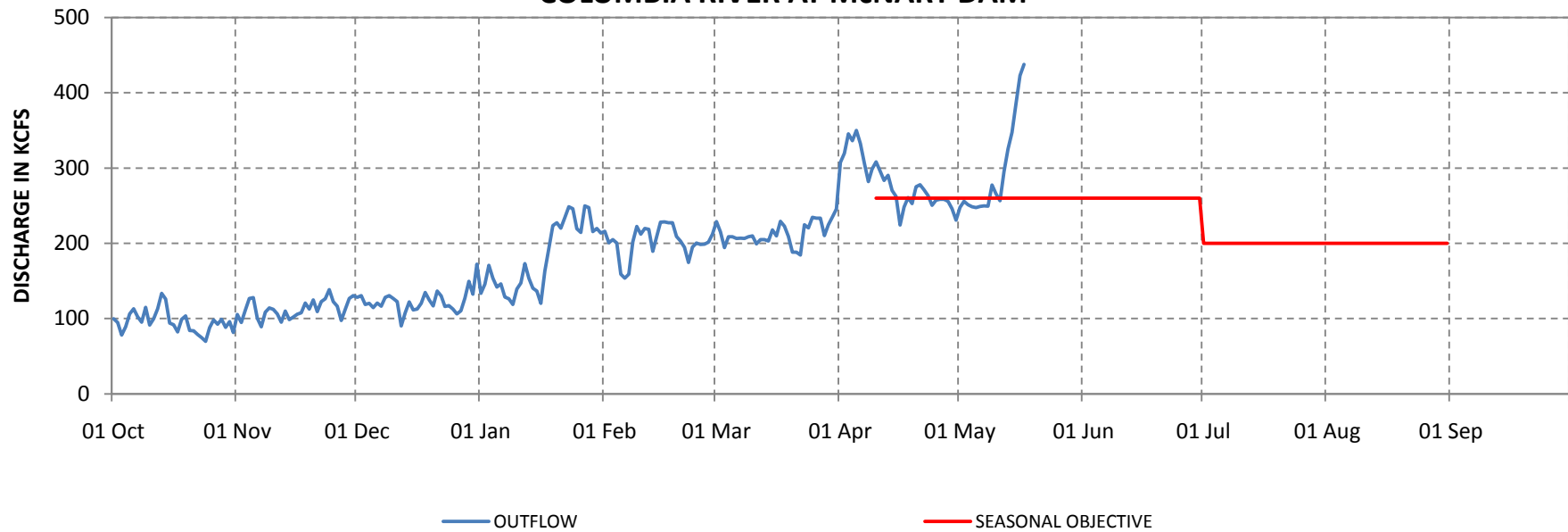


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



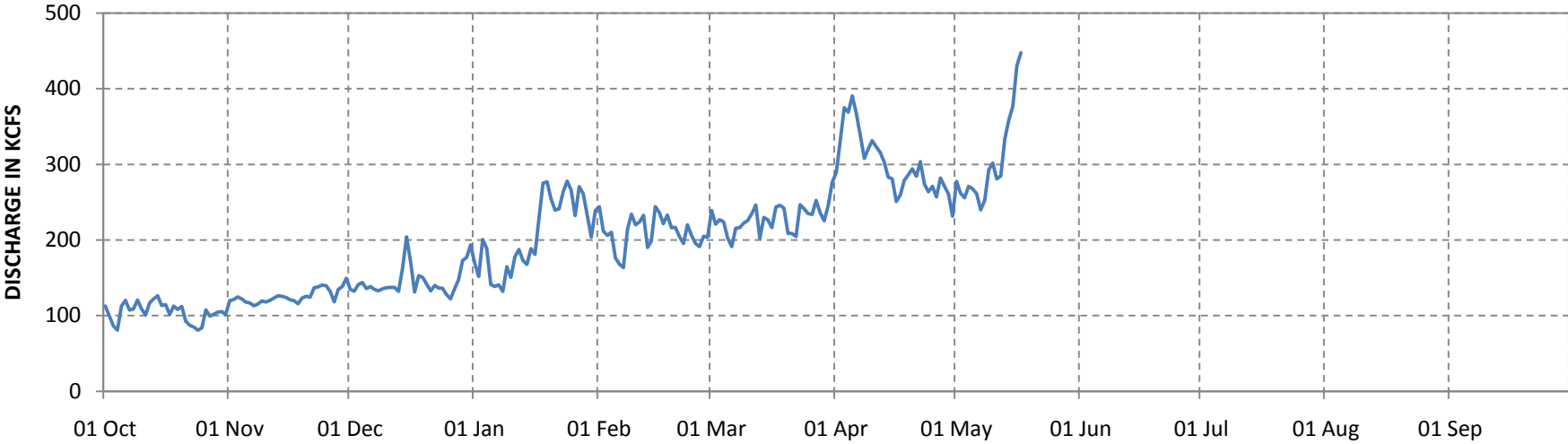
PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM

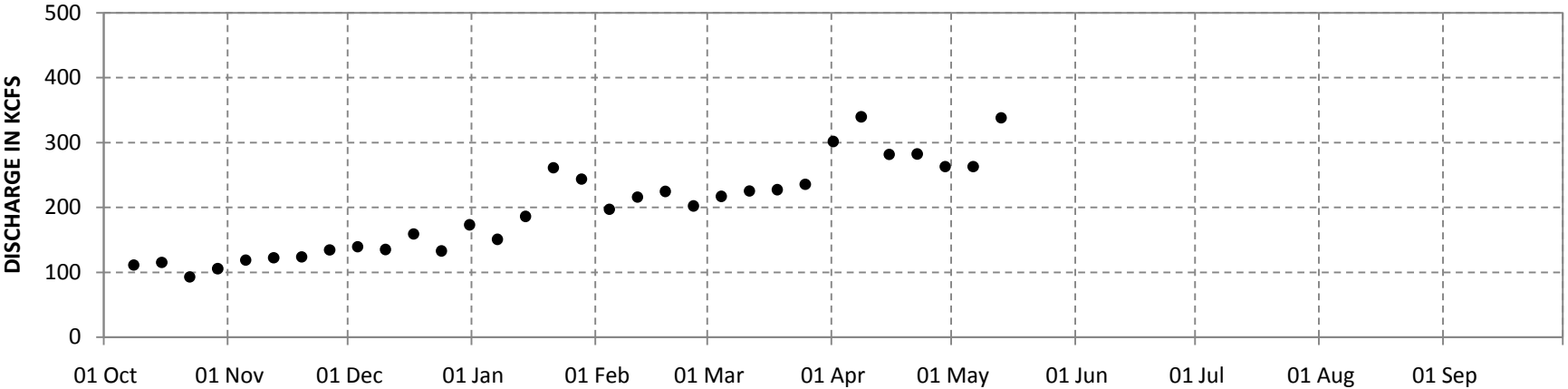


PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT BONNEVILLE DAM



— OUTFLOW — SEASONAL OBJECTIVE

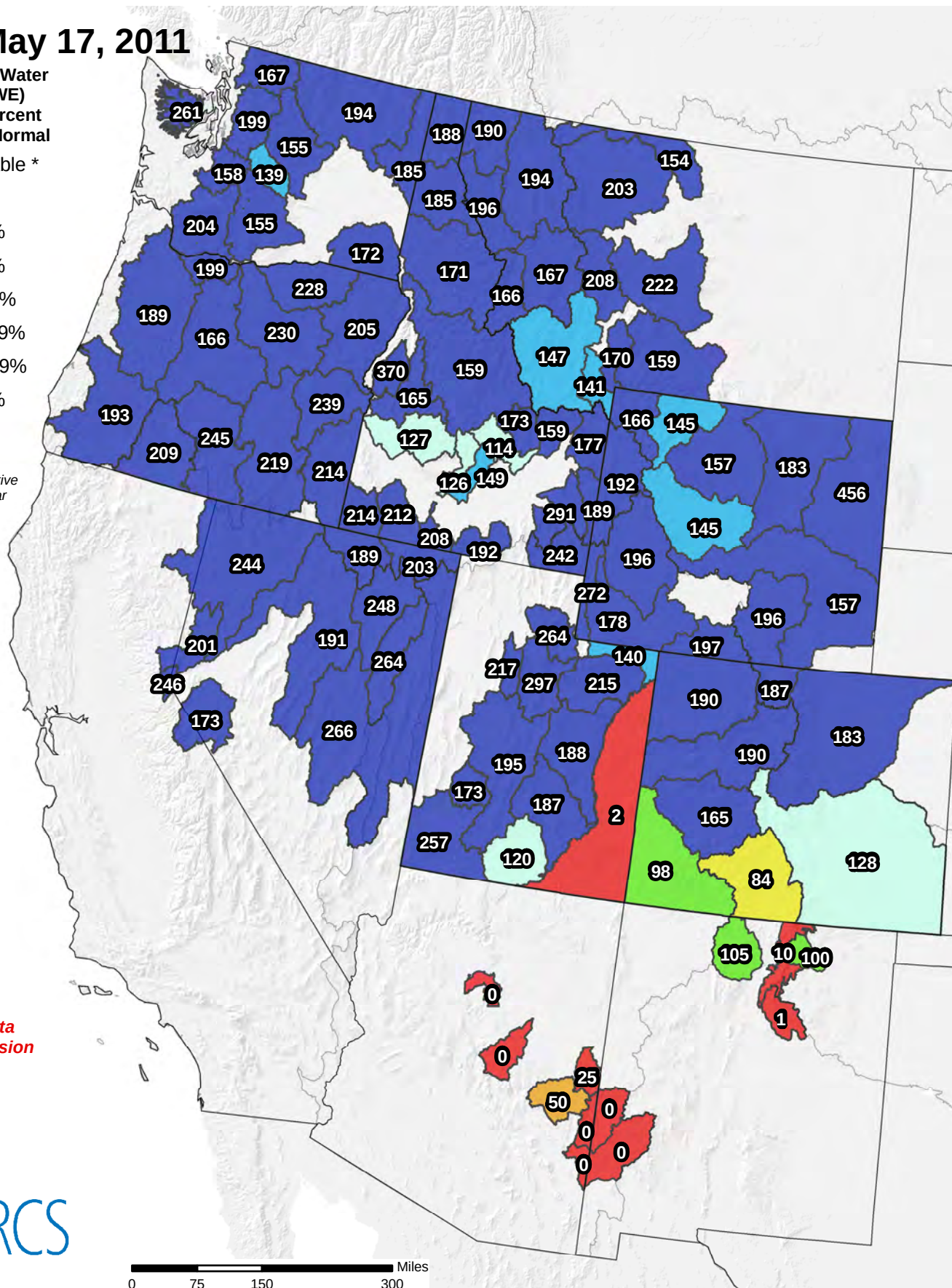


— WEEKLY OBJECTIVE — SEASONAL OBJECTIVE ● WEEKLY OBSERVED — SEASONAL TO-DATE

May 17, 2011

 unavailable *
 <50%
 50 - 69%
 70 - 89%
 90 - 109%
 110 - 129%
 130 - 149%
 >= 150%

**Provisional data
subject to revision**



Prepared by the USDA/NRCS National Water and Climate Center
Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>
Based on data from <http://www.wcc.nrcs.usda.gov/reports/>
Science contact: Jim.Marron@por.usda.gov 503 414 3047

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Friday May 20, 2011 9:00am - 10:00am

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

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*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. The Dalles Navigation Lock - Steve Barton, COE-NWD; Mike Langeslay, COE-NWP, and; Tim Dykstra, COE-NWW
3. Other
 - a. Set agenda and date for next meeting - **May 25, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

May 20, 2011
Emergency Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Donna Silverberg

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Problems at The Dalles

The COE alerted TMT members that they had heard problems in a downstream navigation gate gear box at TDA. While they will not be certain of the cause, the COE believes the bearing is going bad. If true, this could lead to a catastrophic failure of the gate. To avoid this, the COE needs to take the navigation lock down for four days in order to support 24-hour a day repair work.

Implications: no barges, including those carrying juvenile salmon, will be able to pass TDA during this period. The COE called the emergency TMT call to get input from the salmon managers on the best choice from the options they have before them:

Options presented:

- Suspend juvenile transport during the four days
- Transport to the forebay of TDA and release juveniles there
- Transport via trucks

Discussion:

The truck transport idea was discarded at the outset since the truck capacity is insufficient to support the high numbers of fish passing at this time—and it is not an option the salmon managers prefer.

NOAA noted that, given the seasonal trends with transport, this is the best time to be transporting. Given debris in the system, they would like to reduce the opportunity for multiple injuries to juveniles passing. As such, Paul suggested collecting at the usual up-river spots and releasing in the forebay closest to the spillway as possible.

Umatilla/CRITFC, however, supported suspending transport for a day or two. Tom noted that the seasonal trends they usually look to for guidance have never included flows as high as they are now. Those high flows, combined with the regional cool temperatures and the possible safety concerns for barge movement lead him to think leaving in-river is a preferred option. He also suggested the fish likely will move faster in-river than they would in a barge.

TMT members were polled for their level of support on the proposed options:

- Idaho – supports leaving the fish in-river if this is a short term problem. If the COE finds the repair will take longer than four days, then TMT should discuss a contingency plan at the Wed. 5/25 call.
- Washington – agrees with Idaho
- USFWS – agrees with Idaho
- NOAA – can live with this in-river option
- BPA – ok with four days in river and suggests trapping all barges above TDA in case transport becomes necessary for a longer term outage.
- BOR – defers to the COE, agrees with ID
- Montana – was not on the call
- Oregon – was not on the call

ACTION: . The Corps is scheduled to close the TDA navigation lock for emergency repair work on the morning of May 24. The navigation lock is scheduled to reopen on the morning of May 28. . The Corps will temporarily cease the collection of juveniles at LWG, LGS, and LMN on May 22 and will plan on resuming collection on May 26. They will stage barging vessels above TDA in case the outage continues for more than four days. The COE will not hold fish for longer than two days. TMT members will be notified of any updates or changes to this operation via email or at the next scheduled TMT meeting on May 25. .

Next Meeting, 5/25 (Conference Call): To Discuss TDA Operations & Updates

Next Face to Face Meeting, 6/1

The agenda will be developed over the next week. Suggested agenda items should be shared with Steve Barton, Doug Baus or Robin Gumpert.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 20, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton, COE, and facilitated by Donna Silverberg, DS Consulting. Representatives of the COE, NOAA, USFWS, Idaho, Washington, BPA, BOR, CRITFC/Umatilla, and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. The Dalles Navigation Lock Outage

The purpose of today's unscheduled call was to discuss the best way to manage transportation in light of a navigation lock outage at The Dalles Dam beginning May 24. The outage, which will last at least 4 days, is needed for repair of the gearbox of the downstream gate at The Dalles, Mike Langeslay, COE Portland, explained. Continuing to operate the gate without repairs could lead to catastrophic lock failure.

The COE asked TMT for a recommendation on how best to deal with the impact the outage will have on juvenile transportation. There are two viable options: suspend juvenile transport during the outage, or barge and release juveniles into The Dalles forebay until the lock is restored to service – hopefully at 6 am on May 28, if nothing more serious than the gearbox needs repair. Barton said the COE is inclined to suspend transport during the outage, but could support either option.

Barton and Tim Dykstra, COE, offered TMT two caveats. (1) Transport was shut down from May 16-18 except at Little Goose due to high flows, and it could stall again next week even in the absence of a lock outage. Flows above 200 kcfs generally mean transport is suspended. (2) TMT should prepare itself for the possibility that more extensive gate repairs will be needed.

Dykstra and John Bailey, COE, responded to questions regarding the lock outage and transport operation. Scott Bettin, BPA, asked whether trucking would be an option. Not with the numbers of fish being collected at Lower Granite – over 300,000 early this week, Dykstra replied. There are still over 100,000 fish at Lower Granite, way too many to transport in the 4 tankers available. NOAA doesn't favor trucking because it seems to exacerbate the problem of steelhead straying, Wagner said. He asked whether fish are exposed to debris and descaling in the raceways and during loading onto barges. Gatewells and orifices cause the most damage, but once fish enter the raceways, debris isn't as much of a problem, Dykstra replied.

Kiefer asked Wagner whether there was any news on the NOAA study of shorter transportation distances. Wagner said he will ask the Science Center to provide preliminary results for TMT. Kiefer expressed concern that spill at Lower Monumental is being curtailed now by the gas cap, passing more fish through a bypass system that has low adult return rates. Wagner asked whether it's likely the spill priority list will be used this weekend; Bettin said yes.

TMT members stated their views on managing transportation during the lock outage:

- **NOAA** – Given the high levels of TDG and debris in the river, multiple bypass exposure isn't the best option. Leans toward collecting and releasing fish in The Dalles forebay, but could accept either option. The amount of data lost if transport is suspended for 4 days would be minimal.
- **CRITFC/Umatilla** – Given high flows and cool river temperatures, agrees with the COE that transport should be suspended, but could accept either option.
- **Idaho** – Whether we suspend transport or release juveniles at The Dalles, the outage will impact the sockeye transport study. Recommends leaving the fish in river.
- **USFWS** – Recommends leaving the fish in river.
- **Washington** – Recommends leaving the fish in river.
- **BPA** - Recommends leaving the fish in river. As a contingency plan, recommends staging the barges used above The Dalles upriver before the lock closes. This will allow transport to continue from the Snake projects to The Dalles forebay if the outage lasts longer than 4 days.
- **BOR** – Defers to the COE; supports leaving the fish in river.

In accordance with these recommendations, the COE will suspend transport during the 4-day outage and will implement BPA's suggested contingency plan for an extended outage. The tentative date scheduled for the resumption of juvenile transportation is May 26.

3. Next Meeting

The next TMT meeting will be a conference call on May 25 to follow up on The Dalles outage, as well as any other relevant updates.

Name	Affiliation

Steve Barton	COE
Paul Wagner	NOAA
David Wills	USFWS
Russ Kiefer	Idaho
Charles Morrill	Washington
Scott Bettin	BPA
John Roache	BOR
Tom Lorz	CRITFC/Umatilla
Mike Langeslay	COE Portland
John Bailey	COE
Tim Dykstra	COE
Doug Baus	COE
Margaret Filardo	FPC

TECHNICAL MANAGEMENT TEAM

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Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday May 25, 2011 9:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

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AGENDA

1. Welcome and Introductions
2. The Dalles Navigation Lock - Steve Barton, COE-NWD; Mike Langeslay, COE-NWP, and; Tim Dykstra, COE-NWW
3. Little Goose Dam Powerhouse Outage - Steve Barton, COE-NWD
4. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Other
 - a. Set agenda and date for next meeting - **June 1, 2011**
 - b. [\[Calendar 2011\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

May 25, 2011

Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Operations Review

Steve Barton, COE, updated TMT on water conditions and reservoir operations. Vancouver was very near flood stage (15.8'– flood stage is 16'), and The Dalles and Bonneville were being operated at 480 kcfs or higher to maintain flows and manage available storage. An additional ½" of precipitation was expected to fall on the west side of the Basin, indicating Vancouver would stay at or above flood stage by 1/2 foot to a foot later in the week; with the residual runoff and remaining high elevation snowpack, Steve said Vancouver will likely stay above flood stage through May and well in to June.

Preliminary forecasts show end of month flows at The Dalles would increase to 500-510 kcfs. The Snake has also come up, with 200 kcfs discharge out of Lower Granite and Grand Coulee filling rapidly to help manage discharge at The Dalles.

The Dalles Navigation Lock

As follow up from the Friday, 5/20 unscheduled call, Steve Barton shared that the navigation lock at The Dalles went out of service as planned on Tuesday morning, 5/24. An official diagnosis of the duration of the outage was not yet known, though the presumption at this point was that it would be for four days as was discussed last week. Transportation was suspended for now as per TMT agreement.

TMT members discussed the need to revisit this issue and explore alternatives if it is determined that the navigation lock would need to be out for longer than 4 days. Oregon's Ron Boyce suggested that the high flows in the system would support keeping the fish in-river. Idaho's Russ Kiefer said he would need to factor in the duration of the outage. It was determined that TMT should revisit this issue if new information would require a change to the operation discussed last week. (See the **Next Steps** item below).

Little Goose Power Outage

Steve Barton also reported that an investigation at Little Goose revealed serious issues with the transformer and as such, repairs began on T1 on 5/24. The project was removed from the spill priority list as the repairs required a full powerhouse outage except for one unit at the project. The schedule for bringing the project back on was as early as Friday afternoon, 5/27, and as late as Sunday, 5/29.

Tim Dykstra, COE, said adults were moving through Little Goose at consistently high passage rates, an encouraging sign that the outage was not posing a detriment to their passage. He also suggested that collection of fish, if the projects are back on line and flow conditions are adequately safe for barges, would begin at Little Goose on Saturday, 5/28, at 7:00 am.

Charles Morrill noted and thanked the COE for initiating 24 hour hazing at the Lower Monumental Dam Juvenile Fish Facility Bypass Outfall to reduce predation by Pelicans and Tim Dykstra confirmed this change. When the Dept. of Agriculture hazers are not on site at the outfall, COE technicians will continue to haze pelicans at the outfall.

Next Steps

Steve Barton will email TMT with an update on the navigation lock outage schedule, and the COE's plan forward. A tentative conference call was scheduled for Thursday, 5/26 at 2:30 pm as needed if conditions are such that the plan/operation agreed to by TMT (begin collection of fish and resume transportation at Little Goose on 5/28) is no longer feasible and alternatives need to be explored.

The TMT web page will post the agenda with call-in information; and, if cancelled, will be noted at the top of the agenda prior to the meeting.

June 1 TMT Face to Face Meeting

The next face to face TMT meeting is scheduled for Wednesday, June 1 at 9:00 am. The meeting room at the COE is not available and the facilitator is working with TMT members to find an alternative space. The location of the meeting will be posted on the agenda on the TMT web page.

The agenda will be developed over the next week. Suggested agenda items should be shared with Steve Barton, Doug Baus or Robin Gumpert.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 25, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, NOAA, USFWS, Idaho, Washington, BPA, BOR, CRITFC/Umatilla, and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Operations Review – Reservoirs

Barton reported that Vancouver is at 15.8 feet and flood stage is 16 feet, which the Columbia is likely to exceed later this week by half a foot to a foot. To cope with historic inflows and runoff and an expected 0.5 inches of precipitation on the west side of the basin, the COE has been operating The Dalles to a maximum discharge of 480 kcfs. Precipitation has been above normal through May and more is expected. With all of these factors at work, the COE expects to be managing flood control space into June.

Summary plots for individual projects and for the Snake system are linked to this topic on today's agenda. Ron Boyce, Oregon, asked about flow projections on the Columbia. The COE expects flows to increase at The Dalles up to 500-510 kcfs toward the end of May and into June, according to a preliminary estimate, Barton replied.

Paul Wagner, NOAA, asked about the Snake system. It was discharging up to 200 kcfs last night, with the latest forecast remaining around 220 kcfs for the next week. The near term forecast for Lower Granite is 225-230 kcfs, dropping to 190 kcfs toward the end of May, but flows are expected to rise again in June. Charles Morrill, Washington, asked whether these flow projections assume average precipitation. The inflow forecast for the next 3 days at Lower Granite is based on the near term forecast, but beyond that it relies more on modeling than human forecasting, Barton replied. Ruth Burris, PGE, asked whether the entire Coulee operation is oriented to keeping flows at the target discharge of 480 kcfs; Barton said yes. Mary Mellema, BOR, underscored the COE's message that all reservoirs are operating primarily now for flood control.

3. The Dalles Navigation Lock Outage

A major purpose of today's call was to follow up on the effects of the navigation lock outage on transportation, which TMT discussed at length in a conference call May 20. Barton told TMT he hadn't heard yet whether the gear

box inspection will lead to a longer outage than 4 days. That information should be available this afternoon.

Coinciding with the navigation lock outage at The Dalles is a powerhouse outage at Little Goose (see agenda item 4 below). The line out of the Little Goose powerhouse can reliably be expected to return to service any time from May 27-29.

Barton proposed that TMT reconvene only if it appears that either outage will suspend transport operations for more than the 4 days TMT assumed in its May 20 discussion of The Dalles. High flows could also suspend transportation.

4. Little Goose Dam Powerhouse Outage

The Little Goose powerhouse is out of service due to grounding issues, Barton reported.

The best-case scenario is a return to service of the powerhouse on the evening of May 27, Tim Dykstra, COE, reported. This would dovetail with the best-case scenario for return to service of the navigation lock at The Dalles. In the best case, it would make sense to resume collection for transport as early as 7 am on May 28, but due to high inflows collection will probably start on May 30 with the first barge leaving June 1.

The Little Goose outage could last until May 29, but any longer would be unlikely. The good news is adult passage, with 3,270 spring Chinook passing on the first day (May 24) of the outage and more than 500 adults passing this morning. -

Basically, Barton said, three things could impede transportation – the navigation lock outage at The Dalles, the powerhouse outage at Little Goose, or excessive flows. If any of these occur, TMT would basically have the same two options: barging fish to The Dalles forebay or letting them migrate in-river. Barton indicated the COE's intent is to resume the normal juvenile transportation operations as soon as operationally possible and inflows allow.

Ron Boyce said **Oregon's** perspective is that transporting fish to The Dalles isn't an option. Letting fish migrate in river isn't necessarily bad at these flows. The bypass should be used. Russ Kiefer said **Idaho's** perspective will depend on whether juvenile transportation is delayed for another 2 days or 2 weeks.

TMT tentatively scheduled a meeting for 2:30pm on May 26. The intent of this meeting was for the COE to provide TMT members with an update should any new information change the current plan to resume normal juvenile transportation operations as soon as possible contingent upon: 1) the resumption

of normal operations of the The Dalles navigation lock and Little Goose powerhouse and, 2) inflows at Snake River collector projects at levels needed to provide safe navigation conditions for juvenile transportation barges.

[TMT was notified via email this meeting was canceled on May 25 at 3:43pm because the updated information on the status of repair work at The Dalles navigation lock did not substantively change the COE's plan to resume the juvenile transportation operation as soon as possible as discussed during today's TMT meeting.]

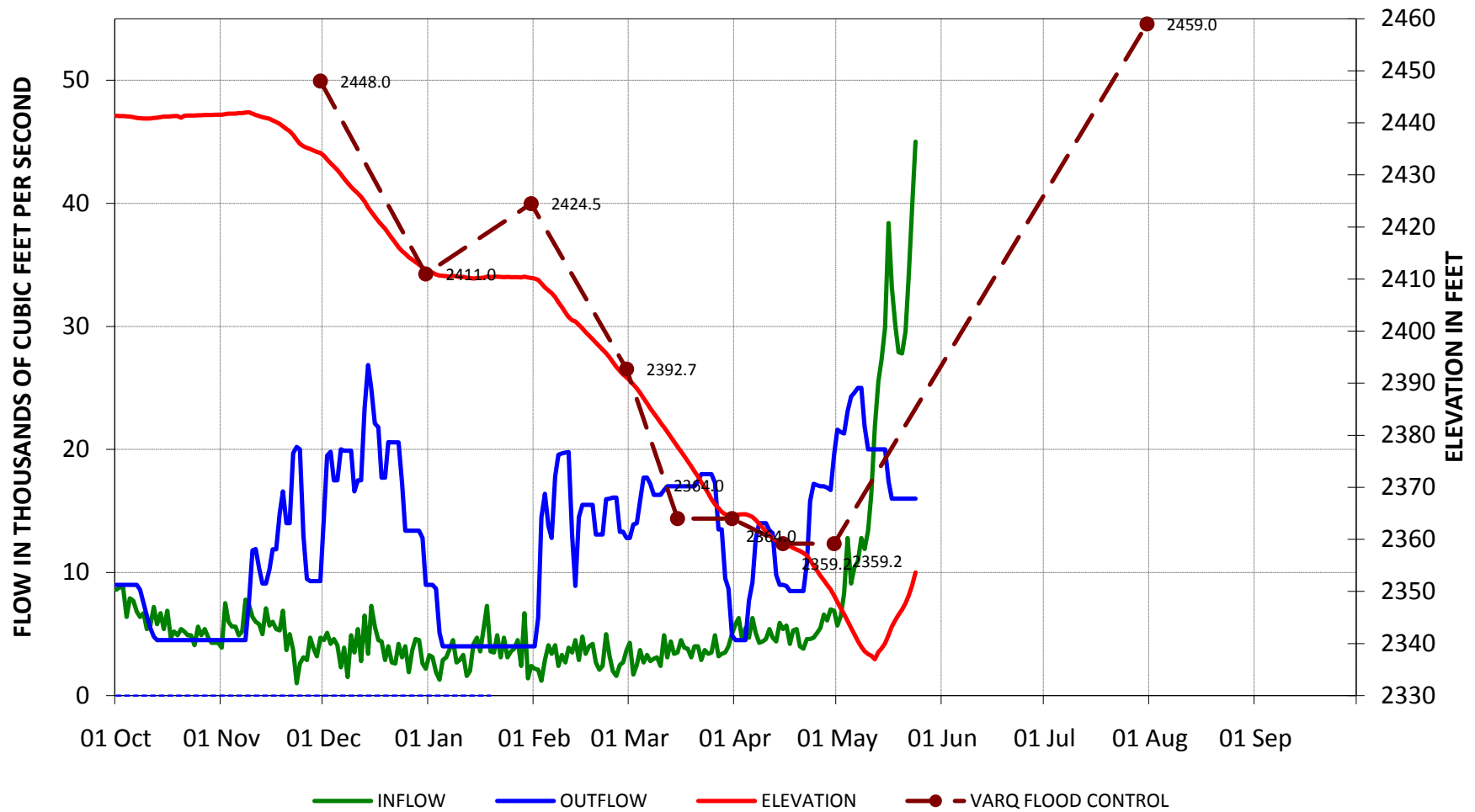
5. Next Meeting

The next TMT meeting will be in person on June 3, location to be advised.

<i>Name</i>	<i>Affiliation</i>
Paul Wagner	NOAA
Charles Morrill	Washington
Scott Bettin	BPA
Mary Mellema	BOR
Steve Barton	COE
Ron Boyce	Oregon
Tim Dykstra	COE
Tim Heizenrader	Centaurus
Russ George	WMC
Gunnar Leffler	COE
Margaret Filardo	FPC
Dave Benner	FPC
Rob Allerman	Deutsch Bank
Bruce McKay	consultant
Jim Litchfield	Montana
David Wills	USFWS
Doug Vine	Thompson Reutters
Scott English	COE
Doug Baus	COE
Richelle Beck	DRA
Shane XX	Capital Power
Ruth Burris	PGE
Tom Lorz	CRITFC/Umatilla
Bill Rudolph	NW Fish Letter
Russ Kiefer	Idaho

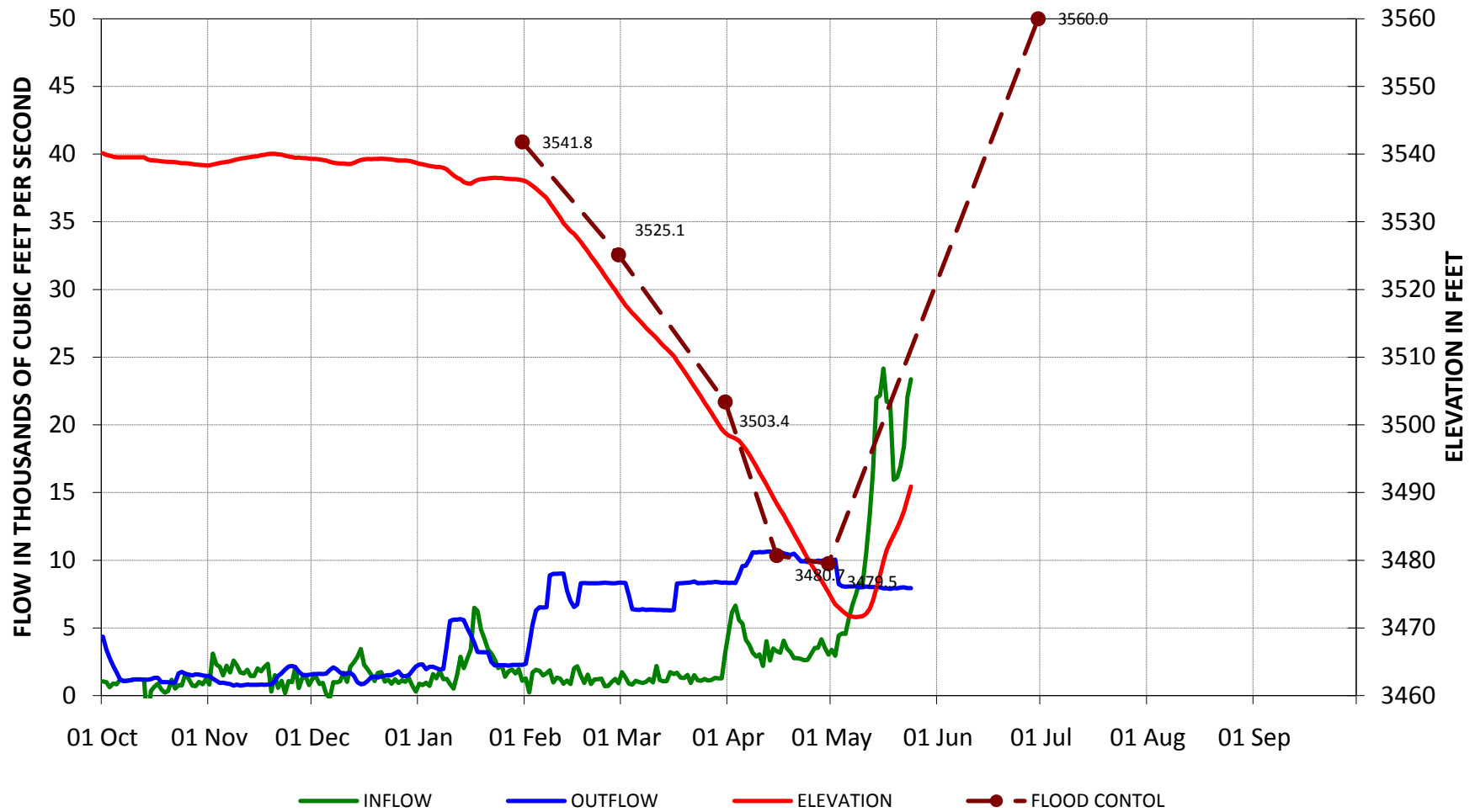
LIBBY DAM AND RESERVOIR

Water Year 2011



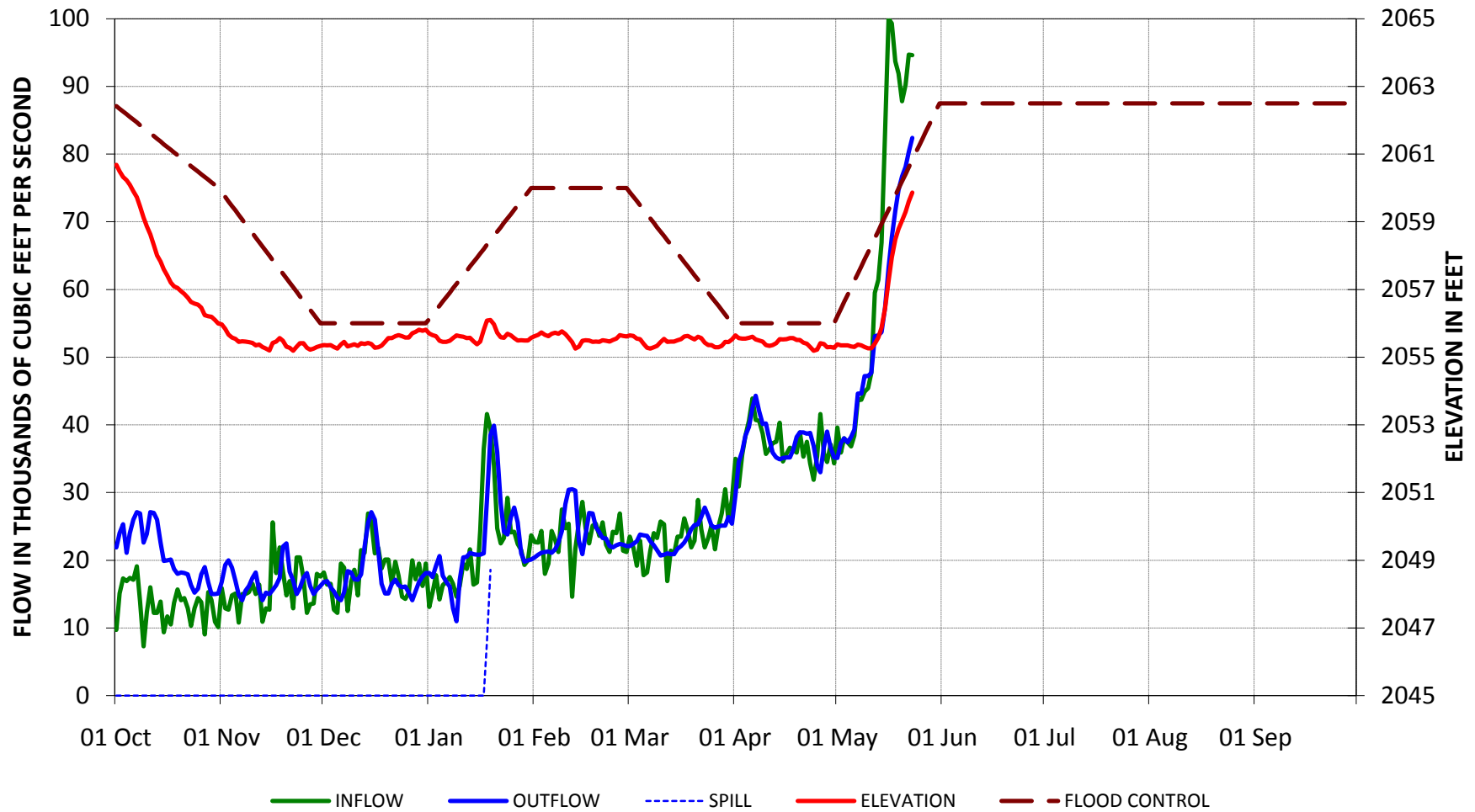
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



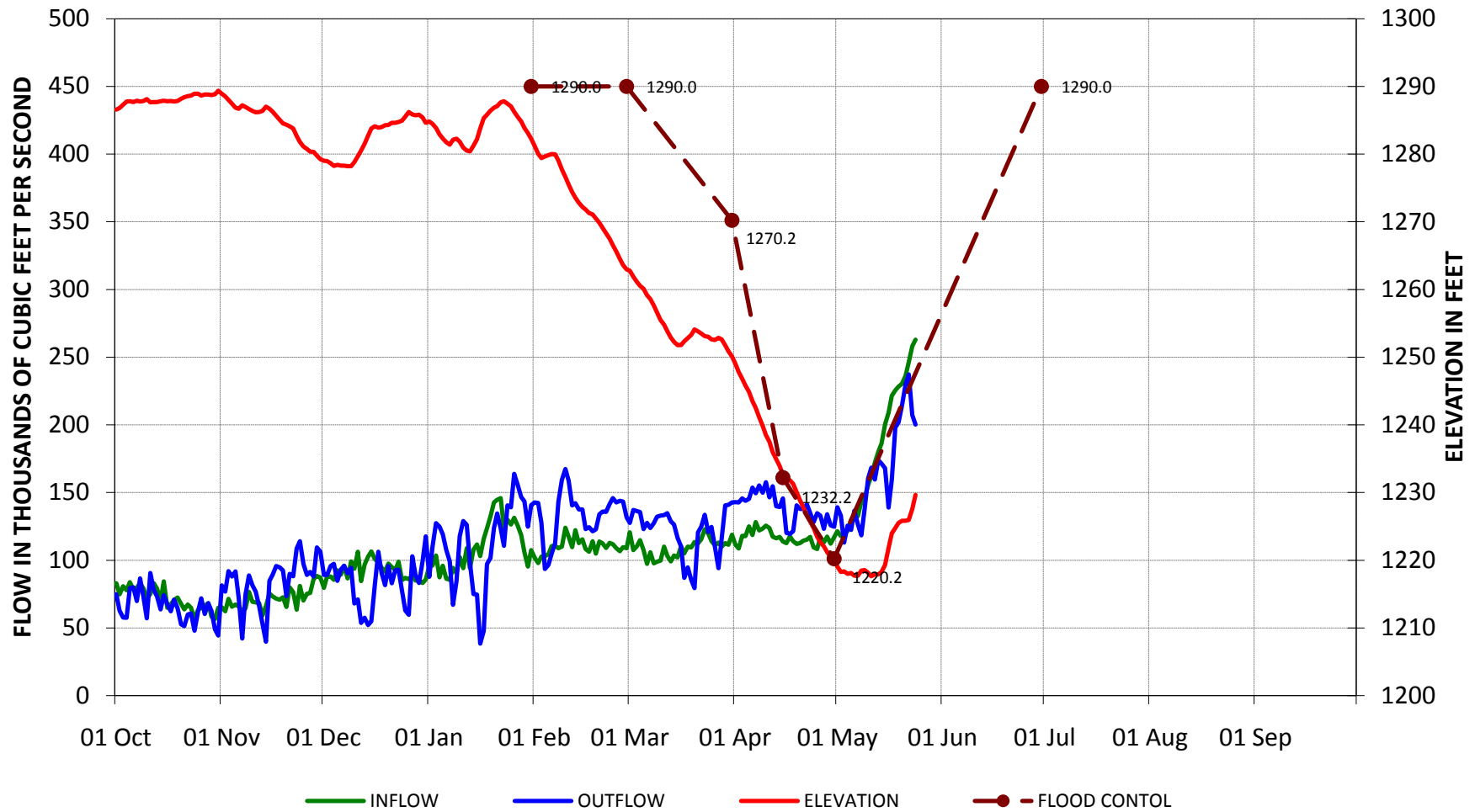
ALBENI FALLS DAM AND RESERVOIR

Water Year 2011



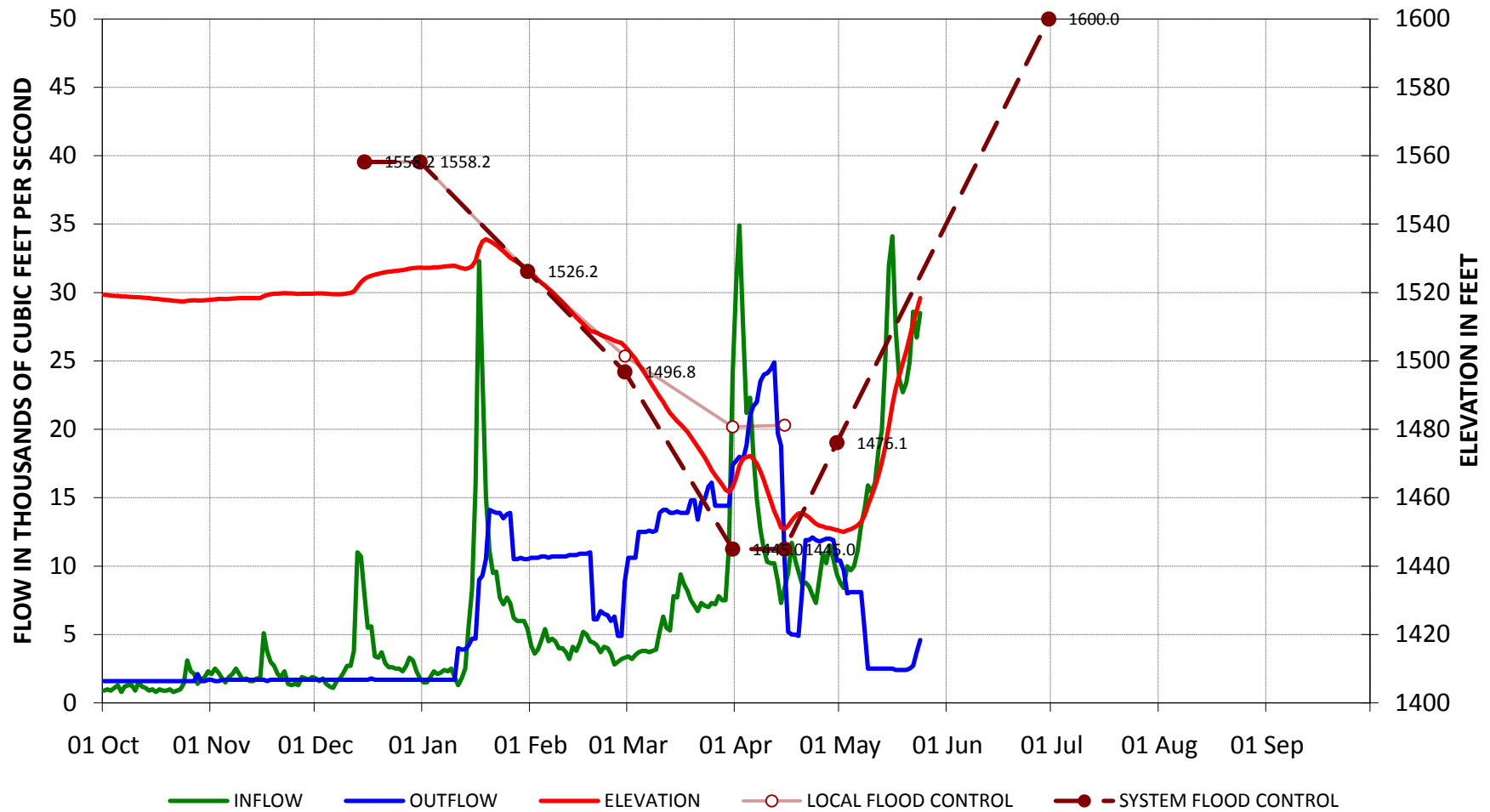
GRAND COULEE DAM AND RESERVOIR

Water Year 2011

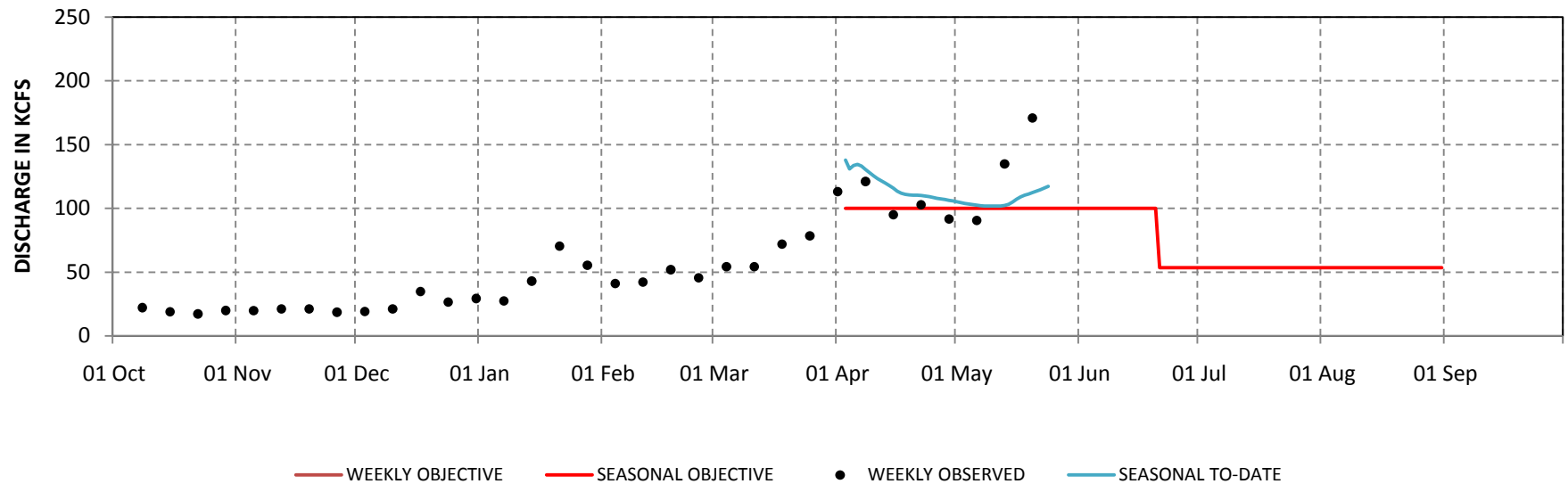


DWORSHAK DAM AND RESERVOIR

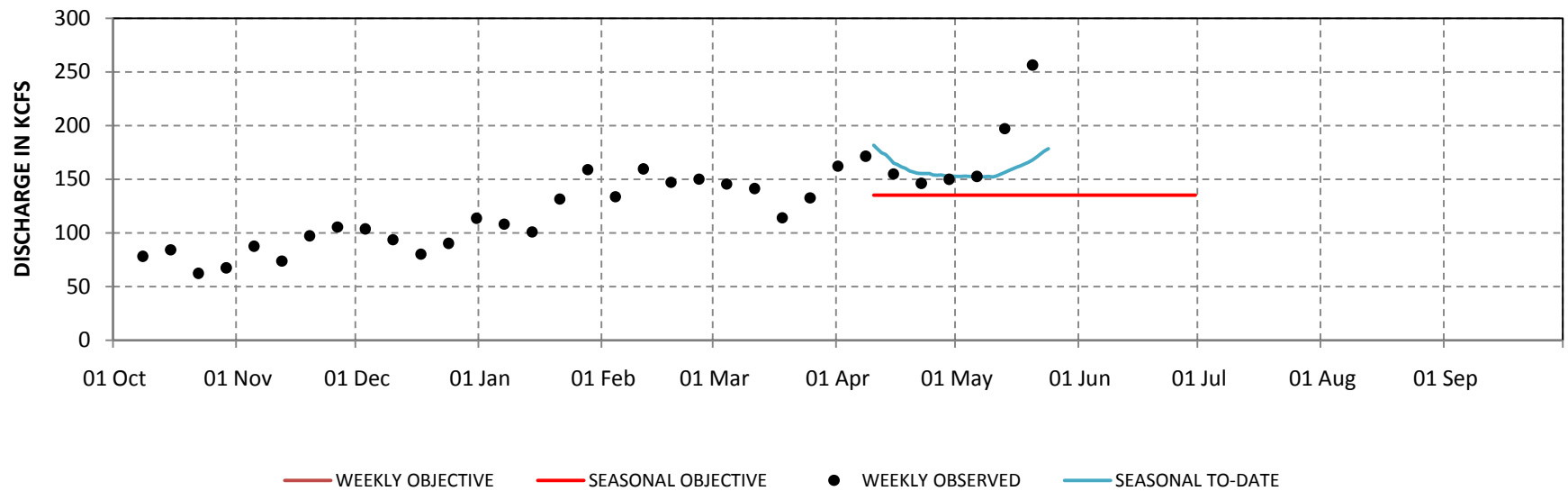
Water Year 2011



PROJECT DISCHARGE SUMMARY SNAKE RIVER AT LOWER GRANITE DAM

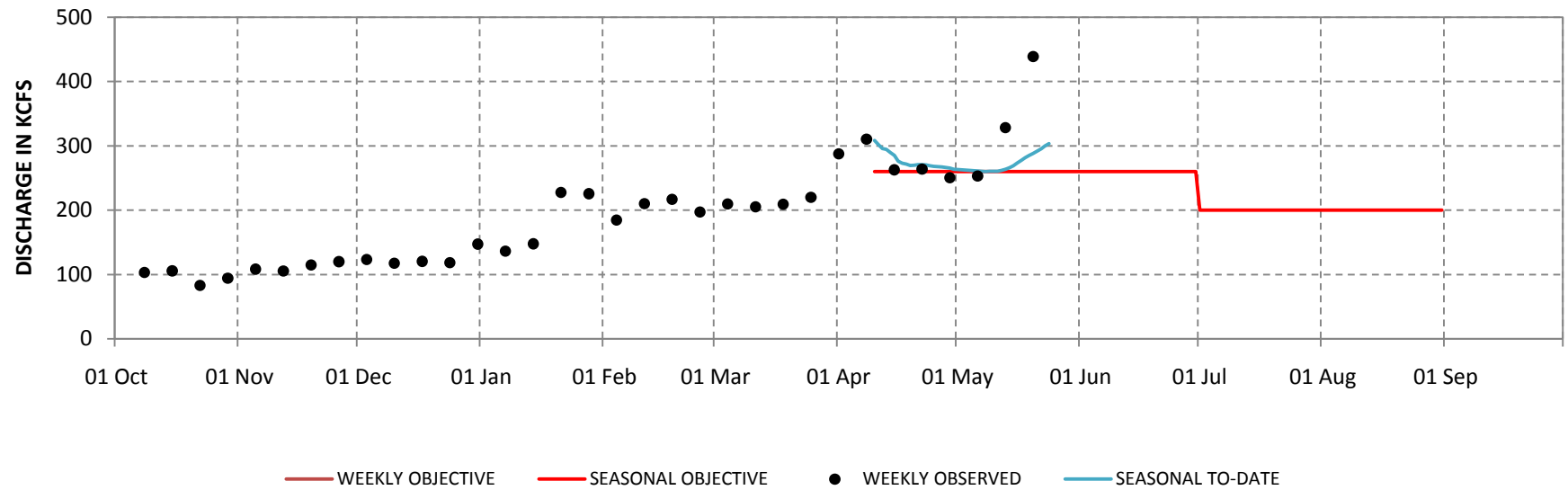
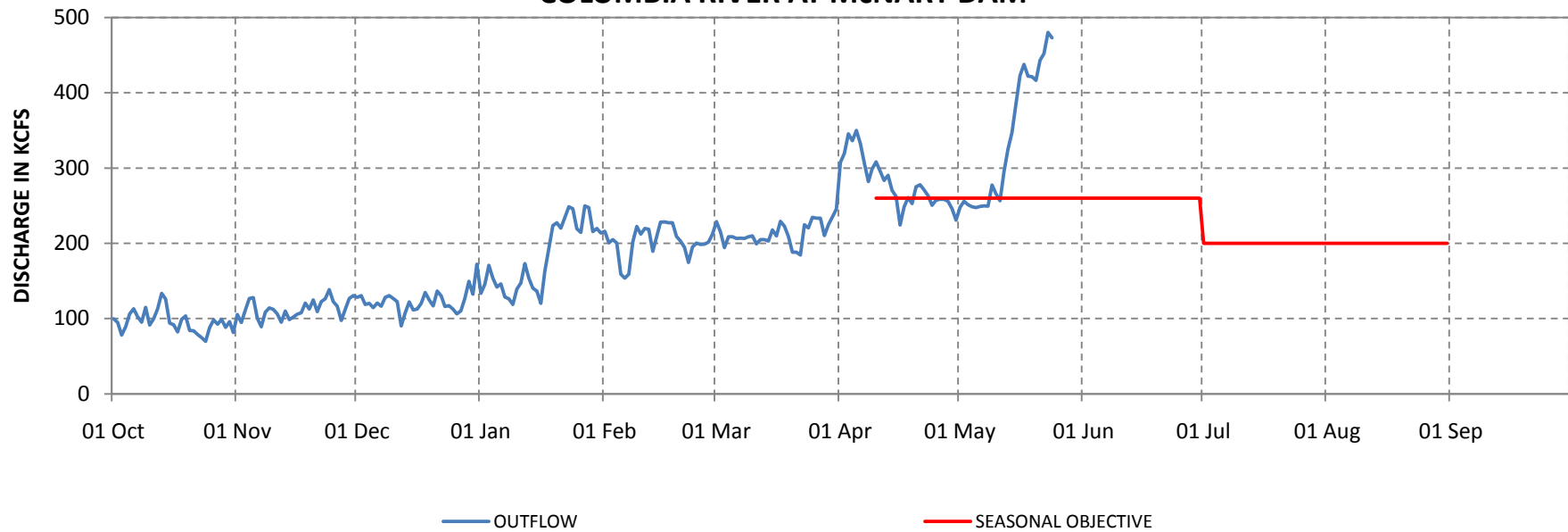


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM

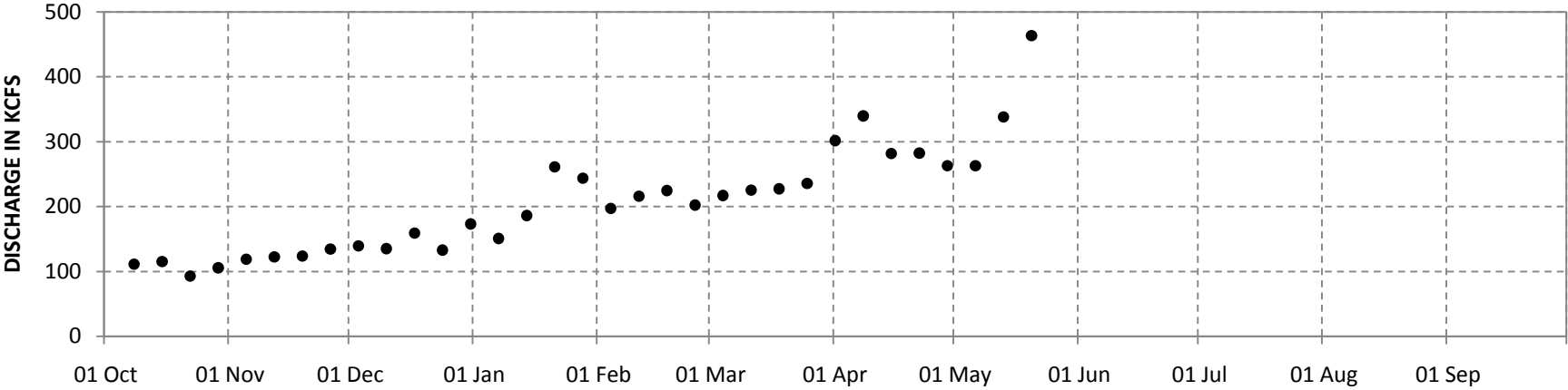


PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT BONNEVILLE DAM



OUTFLOW SEASONAL OBJECTIVE



WEEKLY OBJECTIVE SEASONAL OBJECTIVE WEEKLY OBSERVED SEASONAL TO-DATE

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Thursday May 26, 2011 2:30pm - 3:30pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. The Dalles Navigation Lock - Steve Barton, COE-NWD; Mike Langeslay, COE-NWP, and; Tim Dykstra, COE-NWW
3. Little Goose Dam Powerhouse Outage - Steve Barton, COE-NWD
4. Other
 - a. Set agenda and date for next meeting - **June 1, 2011**
 - b. [\[Calendar 2011\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

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CENWD-PDD

June 2011

Draft 2011 Summer Fish Operations Plan

INTRODUCTION

The 2011 Summer 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 summer fish migration season, generally June through August. The Action Agencies are committed to the summer spill measures and achieving mainstem FCRPS project hydro performance standards contained in the 2010 NOAA Fisheries Supplemental Biological Opinion (2010 Supplemental BiOp)¹ as supported by the BiOp analyses. [Option 1] The Action Agencies are also interested in expeditious resolution of the case challenging these opinions; therefore for summer 2011, the agencies support adoption of the project operations contained in the Order for 2010 Summer Spill Operations. The 2011 Summer FOP adopts project operations in the Order for 2010 Summer Spill Operations with the exception of operational adjustments to conduct essential research at John Day and Bonneville dams.

[Option 2] The Action Agencies support adoption of the project operations identified in the 2010 Summer FOP with the exception of operational adjustments conduct essential research at John Day and Bonneville dams and implementation of the BiOp triggers tailoring the spill end date at the lower Snake River projects in years when juvenile fish are no longer present in significant numbers.²

The 2011 Summer FOP provides for adaptive management and is consistent with the 2010 Supplemental BiOp and the Corps' Record of Consultation and Statement of Decision Document (ROCASOD) adopting the project operations contained in the 2010 Supplemental BiOp. As in the 2010 Summer FOP, operations described herein may be adjusted to address in-season developments through discussion and coordination with regional sovereigns. 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).

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 summer operations for fish at each mainstem project, protocols for fish protection measures

Comment [gnl1]: In providing the draft FOP for collaboration with regional sovereigns, the Corps recommends inclusion of proposed language that will be in the FOP, so that other have the actual language to comment on. Consequently, the Corps is providing 2 options: one assumes adoption of the court ordered operations from the 2010 Summer FOP, with the exception for essential research; the second assumes 2010 summer ops with the exception of essential research and implementation of the BiOp triggers to determine termination of spill at the lower Snake River projects (and any other difference from 2010 Summer FOP that may be identified.)

The area highlighted in this comment is Option 1.

Comment [gnl2]: Option 2

Comment [gnl3]: If the 2011 Summer FOP is not a "rollover," this will be deleted

¹ The 2010 Supplemental BiOp incorporates the NOAA 2008 BiOp

² 2010 Supplemental BiOp Reasonable and Prudent Alternative Table, Table 2

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related to operational emergencies, coordination with regional entities, and monthly reporting.

GENERAL CONSIDERATIONS FOR FISH OPERATIONS

For planning purposes, the Corps' 2011 Summer FOP assumes average runoff conditions. However, because actual runoff conditions vary in timing and shape and may be higher or lower than average 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 accommodate fish research or other conditions and will be coordinated through the TMT and other appropriate regional forums.

Management of Spill for Fish Passage

The Corps will manage spill for fish passage to avoid exceeding 120% TDG in project tailraces, and 115% TDG in the forebay of the next project downstream.³ These levels 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 each project on the lower Columbia and Snake rivers on a daily basis throughout the fish passage season. These spill caps are set so that resultant TDG percent saturation

³ For 2011 summer operations, the Corps will continue to manage TDG to 120% in the tailwater and 115% in the forebay of each mainstem project, consistent with summer 2010 court ordered operations.

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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 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 periods when river discharge is greater than project powerhouse hydraulic capacity 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 122%, 125%, 130%, or 135% saturation as a means of minimizing TDG throughout the system.

The Corps will transition to summer spill operations 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 except during research test period at Bonneville Dam). 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 quantities at dams will be slightly greater or less than specified in Table 2 below. Actual spill levels depend 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.

Operational 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

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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 $\pm 1\%$ of the target percentage for the following hour (or more than $\pm 1\%$ 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 will attempt to adjust spill rates in later hours if necessary, 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 $\pm 1\%$ 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. All of the Snake River 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 instead. At Little Goose, turbine unit 1, the first priority unit during fish passage, typically operates near the upper

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end of the $\pm 1\%$ 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, generally the operating unit runs at the lower end of the $\pm 1\%$ of best efficiency range. However, at Lower Monumental, turbine unit 1, which is the first priority unit during fish passage, has welded blades and consequently cannot operate at the low end of the design range. Ice Harbor turbine units cannot be operated at the lower end of the $\pm 1\%$ of best efficiency range. At generation levels near the lower end of the $\pm 1\%$ of best efficiency range, excessive cavitation occurs, which can damage the turbine runner and also be detrimental to fish. Therefore, Ice Harbor turbine units will operate at a generation level somewhat higher than the lower $\pm 1\%$ limit. Additionally, Ice Harbor unit 2 has welded blades affecting minimum generation for that unit. Minimum generation flow ranges at McNary, John Day, and The Dalles 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 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 under low flow conditions. As flows transition from higher flows to low flows, there may be situations when flows recede at a higher rate than forecasted. In addition, 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 result in forebay elevations dropping to the low end of

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the Minimum Operating Pool (MOP). Consequently, maintaining minimum generation and the target spill may not be possible on every hour since these projects have limited operating flexibility.

During low flow conditions when the navigation lock is being emptied at some projects, the total spill volume remains constant, but the spill reported as a percent of total flow may be temporarily reduced below the target spill percentage. This occurs because 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 $\pm 1\%$ of best efficiency range to operating one unit at the high end of the $\pm 1\%$ 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 flat 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. For 2011, the Fish Passage Operations and Maintenance Team (FPOM) recommended removing the spillway weir from service for the season when river discharge is forecasted to drop below 32 kcfs for three days. Weir removal allows finer control of spill discharge during periods of low river discharge. If necessary in 2011, additional operational adjustments at Little Goose may be implemented during low flow periods after coordination with FPOM/TMT.

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 $\pm 1\%$ requirement than other hours.

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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 $\pm 1\%$ 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 $\pm 1\%$ 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 and Ice Harbor dams during low flow conditions may impact that project's reservoir elevation and cause inadequate navigation depths at the downstream entrances to the Lower Granite and Lower Monumental navigation locks. Therefore, adjustments to pool elevation in the Little Goose pool and Ice Harbor pool, of up to 1.0 ft. above the MOP operating range may be necessary to accommodate safe entrance to the navigation locks 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. Additionally, to accommodate safe navigation, the Lower Granite pool will be operated up to MOP+2 ft. depending on river flow. This operation was requested under System Operational Request (SOR) 2011-01 and coordinated through the TMT on March 31, 2011 available here: <http://www.nwd-wc.usace.army.mil/tmt/sor/2011/>

This operation will continue through the remainder of MOP operations in 2011.

JUVENILE FISH TRANSPORTATION PROGRAM OPERATIONS

The following describes the juvenile fish transportation program under all runoff conditions and is consistent with the 2010 Summer FOP transport operations. The lower Snake River projects are described first, followed by McNary project operations. Detailed descriptions of project and transport facility operations, including the transition from barges to trucks when fish numbers decrease in the summer, are contained in FPP Appendix B.

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Lower Snake River Dams - Operation and Timing

The 2011 Spring FOP provides information about the initiation of transport at the lower Snake River collector projects. Summer transport operations at the lower Snake River collector projects will continue as specified in the Order for 2010 Summer Spill Operations. Starting on or about August 15, fish will be transported by truck, dependant on numbers of subyearling Chinook collected. Transport operations will be carried out concurrent with FOP spill operations at each project and in accordance with all relevant FPP operating criteria. Fish transportation operations for the lower Snake River collector projects are described in FPP Appendix B.

Fish transportation operations are expected to continue through approximately October 31 at Lower Granite and Little Goose dams, and through September 30 at Lower Monumental Dam. Transportation operations may be adjusted due to research, conditions at the collection facilities, or through the adaptive management process to better match juvenile outmigration timing or achieve/maintain performance standards.

McNary Dam - Operation and Timing

Transportation will be initiated at McNary Dam between July 15–30 per the 2010 Supplemental BiOp (RPA 30, Table 4) and in coordination with NOAA Fisheries and the TMT. Fish will be transported from McNary Dam by barge through August 16, then transported by truck every other day. All fish collected will be transported except those marked for in-river studies. Fish are expected to be transported through September 30. The presence of factors such as excess shad, algae or bryozoans that can clog screens and flumes may result in discontinuing transport operations at McNary Dam before September 30. Detailed criteria for McNary transport are contained in the FPP, Appendix B.

Transportation operations may be adjusted for research purposes, due to conditions at the collection facilities, or as a result of the adaptive management process (to better match juvenile outmigration timing and/or to achieve or maintain performance standards). If new information indicates that modifying (or eliminating) transportation operations at McNary Dam is warranted, adaptive management will be used to make appropriate adjustments through coordination with the FPOM/TMT.

SUMMER SPILL OPERATIONS

Lower Snake River Projects

Summer spill will begin on June 21 at Lower Granite, Little Goose, Lower Monumental and Ice Harbor dams. Summer operations will [TBD] at all four lower Snake River projects. Summer spill levels are shown in Table 2.

Comment [gnl4]: Consideration of continuing 2011 court-ordered spill to the end of August or implementing the BiOp triggers tailoring the spill end date at the lower Snake River projects in years when juvenile fish are no longer present in significant numbers is being discussed with regional sovereigns.

For reference, the 2010 Summer FOP said: Summer operations will continue 2009 Court ordered spill through August 31 at all four lower Snake River projects.

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Lower Columbia River Projects

Summer spill will begin June 16 at Bonneville Dam, June 20 at McNary Dam, and July 1 at John Day and The Dalles dams. Summer spill will occur through August 31 at all four Columbia River projects. Summer spill levels are shown in Table 2.

PROJECT SUMMER OPERATIONS

The following sections describe 2011 summer spill operations for each project. Included in the descriptions are planned research activities intended to meet reasonable and prudent alternative actions 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. Dam passage performance tests are planned at John Day, The Dalles, and Bonneville dams during the 2011 summer migration season. The current river flow forecast indicates much higher than normal river flow conditions may limit the ability to conduct the tests as planned at John Day, The Dalles, and Bonneville dams. The Action Agencies, in collaboration with regional sovereigns, will consider if alternative testing options may be warranted.

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

Project	Planned 2011 Summer Spill Operations (Day/Night)	Comments
Lower Granite	18 kcfs/18 kcfs	Same as 2010
Little Goose	30%/30%	Same as 2010
Lower Monumental	17 kcfs/17 kcfs	Same as 2010
Ice Harbor	June 21-July 13: 30%/30% vs. 45 kcfs/Gas Cap July 13-August 31: 45 kcfs/Gas Cap (approximate Gas Cap range: 75-95 kcfs)	Same as 2010
McNary	50%/50%	Same as 2010

⁴ Table 2 displays in summary form the planned summer spill operations. More specific detail governing project operations is included in project specific sections.

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John Day	July 1-July 20: 30%/30% and 40%/40% ⁵ July 20-August 31: 30%/30%	Same as 2010
The Dalles	40%/40%	Same as 2010
Bonneville	June 16-July 20: 85 kcfs/121 kcfs and 95 kcfs/95 kcfs ⁵ July 21-August 31: 75 kcfs/Gas Cap	Same as 2010

Lower Granite

Summer Spill Operations June 21 – August ~~XX~~: 18 kcfs 24 hours per day.

Changes in Operations for Research Purposes:

- Summer research operations: There will be no special spill operations for research in 2011. Spill patterns as described in FPP Section 9 will be used in 2011.

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 when involuntary spill occurs, there may be instances when certain spill levels create hydraulic conditions that are unsafe for fish barges crossing the tailrace and/or while moored at fish loading facilities. If such conditions occur, spill may be reduced temporarily when fish transport barges approach or leave the barge dock or are moored at loading facilities. If conditions warrant a spill reduction, the MOP elevation range at Lower Granite will be exceeded temporarily to enable the barge to exit the tailrace safely.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.

Comment [DHF5]: Consideration of continuing 2011 court-ordered spill to the end of August or implementing the BiOp triggers tailoring the spill end date at the lower Snake River projects in years when juvenile fish are no longer present in significant numbers is being discussed with regional sovereigns.

Little Goose

Summer Spill Operations June 21 – August ~~XX~~: 30% spill 24 hours per day.

Changes in Operations for Research Purposes:

- Summer research operations: There will be no special spill operations for research in 2011. Spill patterns as described in FPP Section 8 will be used in 2011.

Comment [DHF6]: Consideration of continuing 2011 court-ordered spill to the end of August or implementing the BiOp triggers tailoring the spill end date at the lower Snake River projects in years when juvenile fish are no longer present in significant numbers is being discussed with regional sovereigns.

⁵ Pending further discussion with the Studies Review Workgroup (SRWG), the TMT, and the RIOG on how high river flow conditions might influence the ability and/or design of performance standard testing.

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Operational Considerations:

- Daily average flows in the lower Snake River of ≤ 32 kcfs can result in discharge rates from Little Goose Dam that are incompatible with operations and may cause spill quantity fluctuations at Lower Monumental Dam. Alternative Little Goose operations to resolve this issue are described in the Low Flow Operations section above and will be coordinated through the FPOM/TMT.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.
- Turbine Unit 1 Operation: In 2011, 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). If low flow conditions occur in the summer, the full $\pm 1\%$ of best efficiency range may be restored to minimize impact on spill levels.

Lower Monumental

Summer Spill Operations Approximately June 21 – August XX: 17 kcfs 24 hours per day.

Changes in Operations for Research Purposes:

- Summer research operations: There will be no special spill operations for research in 2011. Spill patterns as described in FPP Section 7 will be used in 2011.

Operational Considerations:

- As was implemented during spring operations, if flows exceed turbine capacity plus spill over the 120% TDG spill cap (occurs at ~ 140 kcfs) or when spill over the 120% TDG spill cap is required due to “lack of market” spill at any flow level switch from the bulk to the uniform spill pattern when either of these conditions is likely to occur for 3 or more days. See Corps’ Summary of Decision on SOR 2011-02 here: http://www.nwd-wc.usace.army.mil/tmt/agendas/2011/0511_Agenda.html
- 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.

Comment [DHF7]: Consideration of continuing 2011 court-ordered spill to the end of August or implementing the BiOp triggers tailoring the spill end date at the lower Snake River projects in years when juvenile fish are no longer present in significant numbers is being discussed with regional sovereigns.

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

Ice Harbor

Summer Spill Operations June 21 – August XX: Spill operations will continue from spring at 30% 24 hours per day vs. 45 kcfs day/Gas Cap night until July 13 at 0500 hours, then 45 kcfs day/Gas Cap night through August 31.

Comment [DHF8]: Consideration of continuing 2011 court-ordered spill to the end of August or implementing the BiOp triggers tailoring the spill end date at the lower Snake River projects in years when juvenile fish are no longer present in significant numbers is being discussed with regional sovereigns.

Changes in Operations for Research Purposes:

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

Operational Considerations:

- Spill operation treatments may be rearranged within a week throughout the season. If rearrangement of treatment 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.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.

McNary

Summer Spill Operations June 20 – August 31: 50% spill 24 hours per day without spillway weirs, using the spill patterns contained in Table MCN-10 in FPP section 5.

Changes in Operations for Research Purposes:

Summer research operations: There will be no special spill operations for research in 2011. Nighttime velocity reduction testing on adult lamprey may be initiated in mid-June in the Oregon shore ladder to test entrance and passage success.

Operational Considerations:

- Spill will be curtailed as needed to allow safe operation of fish transportation barges near collection facilities downstream of the project.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.

John Day

Summer Spill Operations July 1 – August 31: Spill operations will continue from spring at 30% and 40% spill 24 hours per day and continue through the test period until

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approximately July 20. During testing, spill levels will alternate in a four-day block with two-day treatments (30% or 40% spill). Spill treatment changes will occur at 2000 hours. Once testing concludes, 30% spill 24 hours per day will continue through August 31. Spill patterns contained in FPP section 4 will be used during summer.

Changes in Operations for Research Purposes:

- Spill duration for performance standard testing: Approximately early June to July 20 (carrying over from spring operations). Dates of testing will be dependent on the fish size, fish availability, and the number of treatments needed for acquiring a statistically valid number of replicates. Final dates for testing will be coordinated through the SRWG. Summer testing will begin prior to summer operations however, the same spill levels implemented in spring (30% and 40%) will continue through summer testing.
- Summer research operations: Performance standard testing at 30% and 40% spill is planned for summer 2011 at John Day Dam. The details of the test will be further coordinated with the SRWG and TMT.
- Objectives of the biological test: The objectives of the study are to assess passage distribution and efficiency metrics, forebay retention, tailrace egress, and survival for subyearling Chinook to determine if juvenile dam survival at either 30% or 40% under the current project configuration meets or exceeds the juvenile dam survival performance standard for summer migrants (93%) specified in the 2010 Supplemental BiOp.
- Spill pattern(s) during biological test: Spill patterns as described in the FPP section 4 will be used.

Comment [DHF9]: If forecasted river conditions preclude the likelihood of conducting a reliable test, the test may be modified or eliminated. Any significant changes in test plans will be coordinated through the SRWG and discussed in collaboration with regional sovereigns.

Operational Considerations:

- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. 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

Summer Spill Operations July 1 – August 31: 40% spill 24 hours per day.

Changes in Operations for Research Purposes:

- Summer research operations: Performance standard testing at 40% spill will occur in summer 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 subyearling Chinook to determine if juvenile dam survival at 40% spill under the current project configuration meets or exceeds the juvenile dam

Comment [gnl10]: If forecasted river conditions preclude the likelihood of a reliable test, the test may be modified or eliminated. Any significant changes in test plans will be coordinated through the SRWG and discussed in collaboration with regional sovereigns.

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survival performance standard for summer migrants (93%) 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:

- 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 FPP section 3 is based on a nominal Bonneville forebay elevation of 74 feet.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.
- If river flow drops below about 90 kcfs then spill may need to drop below 40% spill in order to maintain station service and power system needs.

Bonneville

Summer Spill Operations June 16 – August 31: Summer research operation consisting of 85 kcfs/121 kcfs and/or 95kcfs/95 kcfs. The research operation will begin at 0430 hours approximately June 16 and continue through July 20. Dates of testing will be dependent on the fish size, fish availability, tag availability, and the number of treatments needed for acquiring a statistically valid number of replicates. Final dates for testing will be coordinated through the SRWG. Timing TBD Spill changes will occur according to the daytime spill schedule contained in Table BON-5 in FPP section 2. Following the research operation, a 75 kcfs/Gas Cap operation will begin on July 21 and continue through August 31. It takes approximately 10 minutes to change between day and night summer spill levels.

Comment [DHF11]: In collaboration with regional sovereigns, need to determine if start date of summer research is: June 16 (consistent w/2010 Summer FOP), or June 20 (consistent with 2011 Spring FOP) – or a different date.

Changes in Operations for Research Purposes:

- Spill duration for testing: Approximately June 16 – July 20.
- Summer research operations: Performance standard testing at 85 kcfs/121 kcfs and/or 95kcfs/95 kcfs (unconstrained by the Camas/Washougal fixed monitoring TDG station) spill is planned for summer 2011 at Bonneville Dam.
- Objectives of the biological test: The objectives of the study are to assess passage distribution and efficiency metrics, forebay retention, tailrace egress, and dam survival for subyearling Chinook to determine if juvenile dam survival at 85 kcfs/121 kcfs and/or 95 kcfs/95 kcfs spill under the current project configuration meets or exceeds the juvenile dam survival performance standard for summer migrants (93%) specified in the 2010 Supplemental BiOp. The specific test details will be further coordinated with SRWG and TMT.
- Spill pattern for summer operations: Spill patterns in FPP section 2 will be used.

Comment [DHF12]: If forecasted river conditions preclude the likelihood of conducting a reliable test, the test may be modified or eliminated. Any significant changes in test plans will be coordinated through the SRWG and discussed in collaboration with regional sovereigns.

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Operational Considerations:

- Turbine unit and corner collector outages may be required to repair hydrophones and other research equipment. These will be coordinated through FPOM and TMT.
- The current minimum spill level is 50 kcfs per prior Fish Operations Plans and Fish Passage Plans. In view of the best biological information, alternative minimum spill operations are currently being examined. If an alternative minimum spill operation is developed, changes will be coordinated through regional processes.
- Actual kcfs spill levels at Bonneville Dam may range up to 3 kcfs lower or higher than levels 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 until the afternoon of August 31.
- Unit outages may occur for required or emergency unscheduled maintenance activities described in FPP Appendix A. Dates are subject to change.
- High river flow and excessive debris load at the second powerhouse may require removal of submersible traveling screens (STSs) and vertical barrier screens (VBSs) according to criteria described in FPP Section 2 in coordination with the FPOM.
- Pending further coordination with regional sovereigns, implement an extended turbine operation range at powerhouse one (from 7.3-9.8 kcfs to 7.5-11.5 kcfs). This expands the current operating range of powerhouse one turbine units to a “best geometry” configuration which may be beneficial for juvenile salmonids passing powerhouse one.

Comment [DHF13]: Additional Operational Considerations for 2011.

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, FPOM, and FFDRWG.

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
- the resultant 12-hour average TDG for the tailwater at each project and for the next project’s forebay downstream

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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 six hours: <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 six hours, 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 twelve highest hourly (OR method) and highest consecutive twelve-hour average (WA method) TDG levels daily for each station. These averages are reported at:
http://www.nwd-wc.usace.army.mil/ftp/pub/water_quality/12hr/wa/

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday June 1, 2011 9:00am - 12:00pm

NOAA Fisheries
1201 NE Lloyd Blvd, Willamette Room
Portland, OR 97232

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review May 20, 25 Meeting Minutes [\[Meeting Minutes\]](#)
3. Vernita Bar Update - Russell Langshaw, Grant County PUD
 - a. [Priest Rapids Updates](#)
4. Little Goose Dam Update - Steve Barton, COE-NWD
5. Libby Dam Operations - Steve Barton, COE-NWD and Joel Fenolio, COE-NWS
6. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Water Quality
 - d. Power System
7. Other
 - a. Set agenda and date for next meeting - **June 8, 2011**

b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[*Steve Barton*](#) at (503) 808-3945, or

[*Doug Baus*](#) at (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 1, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Minutes Review

TMT reviewed the Official Meeting Minutes and Facilitator's Notes from the 5/18, 5/20 and 5/25 TMT meetings. One change was suggested: in the 5/18 Official Minutes, under the fish update, 9 million steelhead had passed Lower Granite, not 11.5 million.

With this change, the notes were considered final.

Vernita Bar update

Russell Langshaw, Grant County PUD, shared an update and accompanying slides on the Priest Rapids operation. He reported that tailrace temperatures were warming but still cooler than normal. He suggested it would be another three weeks to get to the 1400 temperature units from end of spawning (1149.1 tu's). Priest Rapids operations from 4/28-5/27 showed average daily discharges were 298.2 kcfs, well above the 50 kcfs minimum for the operation. Fish were moving but not many were observed stranded or entrapped. Tom Lorz, CTUIR/CRITFC, said CRITFC will be out later in the week to collect and tag fish. Everyone acknowledged that the fish will be found in unique places this year given the high flows! Russell will provide another Vernita Bar update at the 6/15 TMT meeting.

Little Goose Powerhouse Outage Update

Steve Barton, COE, updated TMT from last week that work on the transformer had been completed yesterday (5/31) at Little Goose. However, the transformer was not able to come back on line and operators were investigating the cause for this problem. As such, the powerhouse was still out of service at the time of this TMT update, but it was reported the project would be back on line by noon today.

Steve also reported that The Dalles navigation lock work had been completed and the project was back to fully functioning as of 5/26. Doug Baus, COE, reported that collection and transportation of juvenile fish had resumed at Little Goose, Lower Granite and Lower Monumental Dams.

Libby Operations Update

Steve Barton, COE, reported that Libby was operating at 23 kcfs outflows to manage refill at the project. Temperatures had dropped a bit over the weekend. The sturgeon accounting had not yet begun, and the project was still operating to flood control. In response to a question, Steve said the preferred depth for sturgeon had not quite been

met, and elevations had not yet touched flood stage at Bonners Ferry. Operations would not likely shift during the near term given the residual snow pack and impending runoff, and high flows expected to continue. Scott Bettin, BPA, reported that 8 fish had been observed above Bonners Ferry. Steve suggested that TMT discussions will focus on shaping later summer flows once the peak has passed. This item will be added to TMT agendas throughout the summer.

Operations Review

Reservoirs – Steve Barton continued with his report on COE projects. Albeni Falls was at elevation 2061.7 feet, with 99.2 kcfs outflows. Dworshak was at elevation 1537.2 feet, with 19.4 kcfs inflows and 6.9 kcfs outflows. The project was targeting full pool around July 1. Steve Hall, Walla Walla District, said daily fluctuating discharges at the project were due to load shaping to minimize spill – in an effort to support system-wide efforts. Priest Rapids daily average outflows were 326.1 kcfs; Lower Granite daily average outflows were 157.2 kcfs; McNary outflows were 473.5 kcfs; and Bonneville outflows were 504 kcfs (nearing its targeted outflow of 525 kcfs). Vancouver and Portland were very near their respective flood stages, and the Willamette had some space left to help allay the high water issues as needed.

John Roache, Reclamation, reported that Hungry Horse was at elevation 3498.71 feet with 8 kcfs outflows. Columbia Falls was expected to reach flood stage this week. Grand Coulee was at elevation 1234.6 feet and refill was being managed for flood control. The project was currently passing inflow. It was reported that a motion had been filed with Judge Redden for a temporary restraining order on spill at Grand Coulee, and this motion was denied.

Fish – Paul Wagner, NOAA, reported on the adult migration. The last of the Spring Chinook counts had concluded at Bonneville Dam, now moving in to Summer counts. The spring Chinook migration was late and counts were high at Bonneville this year. Jacks were still coming in and counts were very high, with a total count so far 400% above average at Bonneville. Adult passage was not as high at the other projects due to the high flows; Ice Harbor daily counts dropped from 1,500 to 150. Adult passage at Little Goose was still strong during the outage and with spill at 100% instead of 30% -- given the unique flows, it was not certain if and how spill patterns vs. flows were influencing passage at the project.

The yearling Chinook migration was winding down, with counts at Lower Granite at 3,751; 7,500 at Lower Monumental; and 30,000 at McNary. Subyearling numbers were picking up at Lower Granite, Little Goose, Lower Monumental and McNary. Sockeye had mostly passed, though 5,400 were counted at John Day. Lamprey passage peaked in May and counts were now down. Steelhead numbers remained high at Lower Granite and in the Lower Snake.

Doug Baus, COE, reported Bonneville Dam powerhouse 2 fish screens had been removed. Units 14,15, and 16 were removed from May 19-21 and Units 12, 13, 17, and 18 were removed May 24-26. Given the high flows, the screens were not likely to go

back in soon – protocols from the Fish Passage Plan were being used to manage removal and reinstallation of the screens. This operation is being coordinated in FPOM.

Margaret Filardo, Fish Passage Center, reported on gas bubble trauma. At Lower Monumental, 23% of the fish showed signs of trauma. Sampling was scheduled again today at this project and McNary, and at Rock Island on 5/2. The salmon managers would continue to monitor this data and report out to TMT at a future meeting.

Water quality – Scott English, COE, reported that TDG levels were high throughout the Columbia Basin due to the high flows. The Cascade Island fixed monitoring station, Bonneville Dam's tailwater FMS (CCIW) was out of service since May 17th due to damage by debris and high flows. USGS can make repairs to the CCIW FMS can be made once Bonneville spill drops below 235 kcfs. In the meantime we are using an analog for CCIW using WRNO when both FMS were operational.

Power system – Nothing to report.

Other – A question was raised about the COE's plans to do a sediment survey around Lower Granite once the flows recede and in an effort to determine next steps to address navigation issues at the project that have been discussed at TMT. Steve Barton and Steve Hall will provide an update on this at TMT in late June or early July.

Next Meeting, 6/8 (Conference Call): Placeholder as Needed

Participants should check the TMT website on 6/7 for an update on agenda and/or cancellation of this meeting, which will be determined by the TMT.

Next Face to Face Meeting, 6/15

The agenda will be developed over the next week. Suggested agenda items should be shared with Steve Barton, Doug Baus or Robin Gumpert.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 1, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of NOAA, COE, CRITFC/ Umatilla, BPA, Montana, Oregon, Washington, BOR, the Colville Tribe, Nez Perce Tribe, Idaho and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Questions or comments should be directed to the TMT chair.

2. Review May 18, 20 and May 25 Meeting Minutes

Charles Morrill, Washington, commented on the May 18 official minutes. In the juvenile section of the fish portion of the operations review, 11.5 million steelhead should be 9 million steelhead. With this change, the official minutes and facilitator's notes are considered final.

3. Vernita Bar Update

The cold trend continues although warming is occurring at an expected rate, Russell Langshaw, Grant PUD, reported. At 1,149 ATUs, the protection program will continue until 1,400 ATUs is reached, or for approximately 3 more weeks. The figures attached to this item on today's agenda show redd and tailrace temperatures, program operations from April 28 to May 27, and constraints on Priest Rapids Dam over the past 7 days. Discharges are high and have been well above the 50 kcfs minimum for some time. The mean over the past 7 days is 298.2 kcfs, and the daily delta has been 61.6 kcfs. Daily delta constraints were 150 kcfs over the last 7 days.

Paul Wagner, NOAA, asked about the stranding study. WDFW workers have been seeing lots of fish but few entrapments because the banks are so steep at these flows, Langshaw replied. Tom Lorz said a CRITFC fishery crew will be collecting and marking fish in that area over the coming week. They will look for stranded fish but haven't seen many so far this year. Langshaw will give another update on the Vernita Bar operation at the June 15 TMT meeting.

4. Little Goose Dam Update

Last week the COE notified TMT members via email that the Little Goose powerhouse outage was extended until yesterday, Barton reported. Although the work on the transformer has been completed, the powerhouse remains out of service. Workers trying to reconnect to the grid keep receiving a trip signal.

Barton said COE and BPA crews have been working around the clock to determine whether part of all of the units can be brought back on line. Barton will update TMT this afternoon via email on the Little Goose powerhouse outage.

Normal juvenile transporation operations have resumed at Lower Granite, Little Goose, and Lower Monumental, Barton reported. Although there are few fish to collect at Little Goose with the dam on 100% spill, crews have been picking up whatever fish are present.

5. Libby Dam Operations

Temperatures dropped over the weekend and the project is discharging 23 kcfs, mainly to manage refill, Barton said. There has been no sturgeon flow accounting yet, and the project remains on flood control operations. There is little temperature control available at present because the forebay is not stratified, Scott Bettin, BPA, reported. The last report was of 8 sturgeon seen in the area.

Barton reported the Bonners Ferry stage peaked at 1,761.6 feet and receded slightly. It is expected to rise again, but not to flood stage of 1,764 feet. At this point, there's no significant difference between operating for flood control and spilling for sturgeon at Libby. Once Libby peak inflows are past, there will be more for TMT to discuss in terms of managing water in July through September. With the volume of water this year, there's a 10-foot draft requirement down to elevation 2,449 feet at the end of September for flow augmentation. TMT will revisit Libby operations at its next meeting in person on July 15.

6. Operations Review

a. Reservoirs. Albeni Falls peak inflows exceeded 100 kcfs; inflows were 94.7 kcfs yesterday. Project elevation is 2,061.7 feet, with lots of snow pack and more volume coming.

Dworshak inflows are 19.4 kcfs, with daily average discharges of 6.9 kcfs and an elevation of 1,537.2 feet. The project is on a trajectory toward full pool at 1600 feet and is currently discharging to manage refill. A 24-hour differential in discharges is the result of load shaping to minimize the amount of involuntary spill, Steve Hall, COE, explained.

Priest Rapids is discharging 326.1 kcfs as Grand Coulee continues to release elevated flows for flood control. Lower Granite has had daily average flows above 200 kcfs, with current flows of 157.2 kcfs and increases forecast over the next week. McNary is discharging 473.5 kcfs, with a peak daily average of 500 kcfs. Flows are well over their seasonal objectives.

Bonneville has been discharging more than 500 kcfs per day in order to manage refill with an increasing water supply forecast. Vancouver is currently at

17.4 feet elevation, which is above flood stage at 16 feet. Portland is at 17.1 feet with flood stage at 18 feet. These conditions are likely to persist over the coming weeks, and elevations could rise if precipitation continues to be above normal, Barton said. There is some space in the Willamette watershed that could be used to help shave the peak off flows into the Portland/Vancouver area.

Doug Baus, COE, gave an update on the Bonneville 2nd powerhouse screen removal operation. On May 19-21, the fish screens were pulled from units 14-16. On May 24-26, the remaining screens were pulled from units 12, 13, 17 and 18, leaving the 2nd powerhouse without screens. Rising tributary levels or additional water volume could bring more debris, Barton said.

Hungry Horse is at elevation 3,498.71 feet, with 8 kcfs releases. More runoff is expected in June. The River Forecast Center predicts that Columbia Falls will hit flood stage this week. Grand Coulee is at elevation 1,234.6 feet and passing inflows. It is expected to refill as temperatures rise.

b. Fish. Adults: The spring Chinook run didn't start until late April this year, then it took off and declined as expected, with 2,000 fish passing Bonneville yesterday. Summer Chinook passage begins today. This year's jack migration at Bonneville is 400% of average, generally a sign that next year's run will be good. High flows are keeping fish from passing other projects at the expected rate – less than 1,000 fish are passing John Day and McNary per day. Ice Harbor passage dropped from 1,500 to 150 fish per day. Apparently 100% spill at Little Goose has not affected fish as adversely as it could have, although some 12,000 fish remain unaccounted for between Lower Monumental and Little Goose pool. There was agreement that this deficit was not caused by 100% spill at Goose.

Juveniles: Yearling chinook smolt passage peaked in May and is nearing its typical end in June. The most recent index count was 3,700 fish at Little Goose. Lower Monumental passed 7,500 fish. Subyearling hatchery releases are showing up at Lower Granite, Lower Monumental, Hanford reach and the lower river projects. Sockeye hatchery releases have passed Lower Granite, Little Goose and Lower Monumental, as well as the mid Columbia projects. There has been no lamprey passage on the Snake River recently. Peak lamprey passage at the mid and lower Columbia projects was on May 22.

GBT data: Margaret Filardo, FPC, reported that the high flows have led to significant increases in fish with gas bubble trauma. At Lower Monumental, 23% of fish were found with GBT symptoms, while at Rock Island it was 37%. At the current levels of TDG, fish tend to display more severe signs as time progresses.

c. Power. There was nothing to report today.

d. Water Quality. Scott English, COE, reported that TDG levels were high throughout the Columbia Basin due to the high flows. The Cascade Island fixed

monitoring station, Bonneville Dam's tailwater FMS (CCIW) was out of service since May 17th due to damage by debris and high flows. USGS can make repairs to the CCIW FMS once Bonneville spill drops below 235 kcfs. In the meantime we are using an analog for CCIW TDG production using WRNO when both FMS were operational.

7. Next Meeting

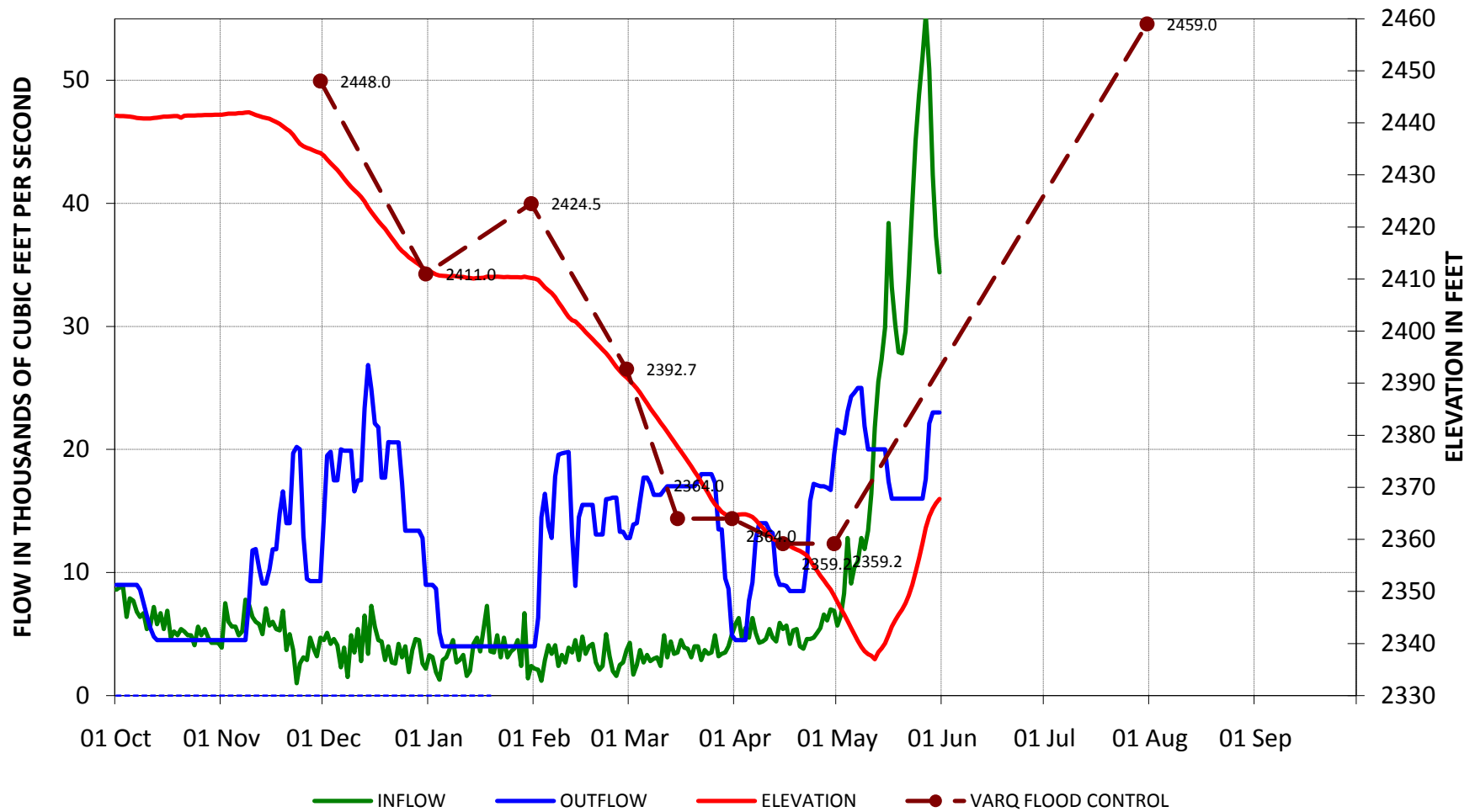
A TMT call was tentatively scheduled for June 8. The next regular meeting in person will be on June 15.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Paul Wagner	NOAA
Tom Lorz	CRITFC/Umatilla
Scott Bettin	BPA
Tony Norris	BPA
Jim Litchfield	Montana
Rick Kruger	Oregon
Doug Baus	COE

<i>Phone:</i>	
Charles Morrill	Washington
John Roache	BOR
Sheri Sears	Colville
Laura Hamilton	COE
Tim Heizenrader	Centaurus
Bruce McKay	consultant
Russ George	WMC
Barry Espenson	CBB
Alex Cibarra	Grant PUD
Russell Langshaw	Grant PUD
Richelle Beck	DRA
Scott English	COE
Dave Benner	FPC
Bill Rudolph	NW Fish Letter
XX	Thompson Reuters
Dave Statler	Nez Perce
Mike Shapley	Snohomish PUD
Steve Hall	COE
Shane Scott	PPC
Russ Kiefer	Idaho

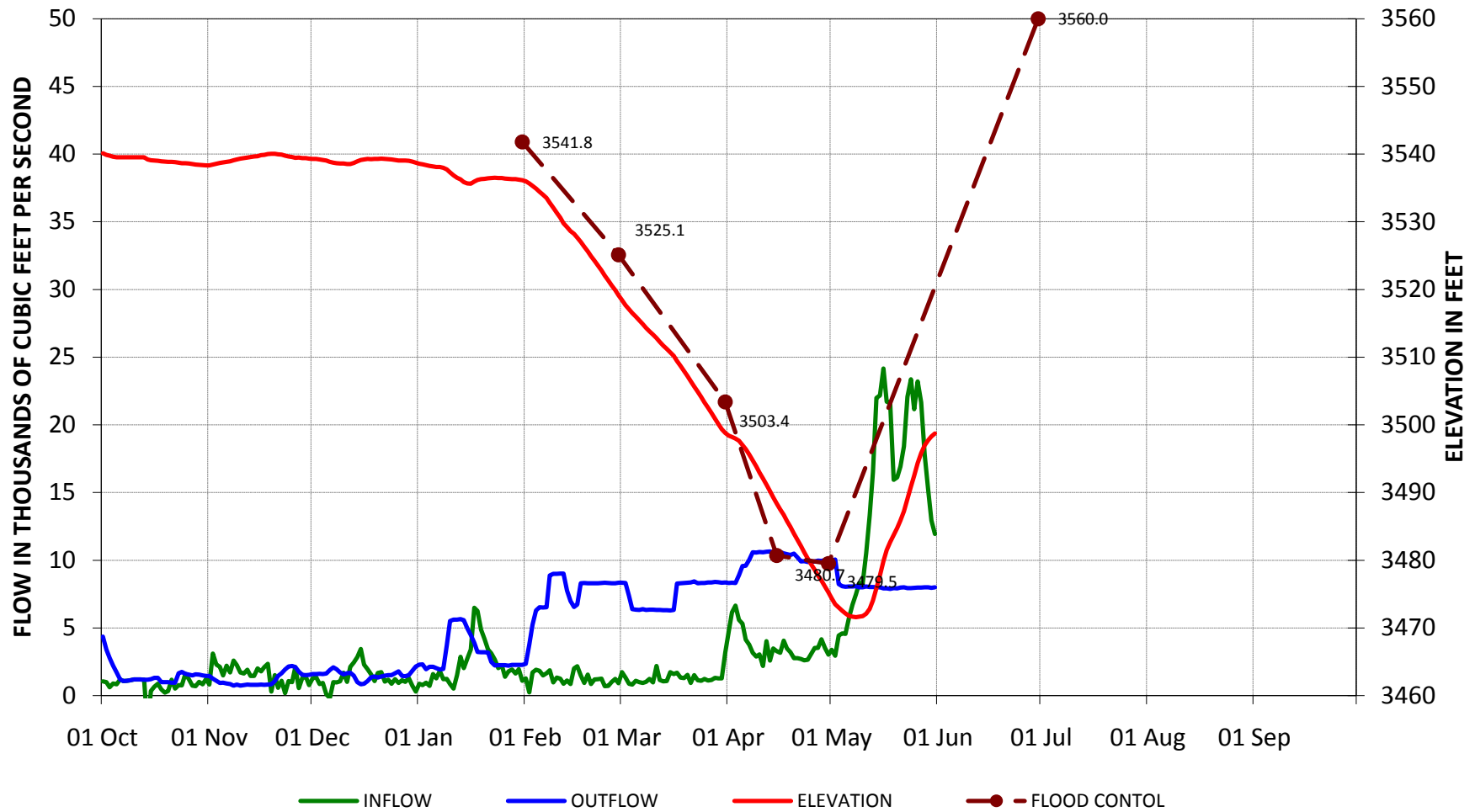
LIBBY DAM AND RESERVOIR

Water Year 2011



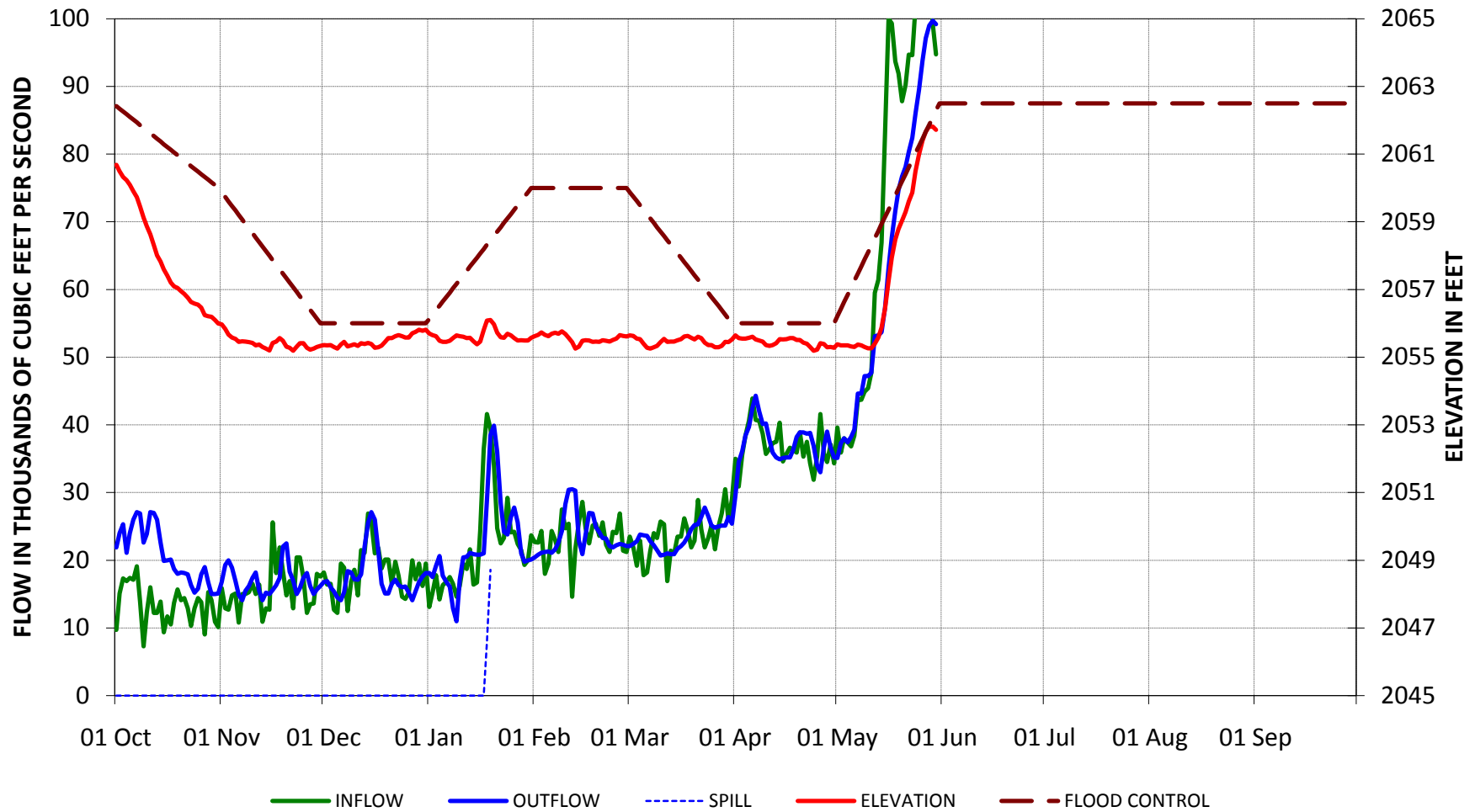
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



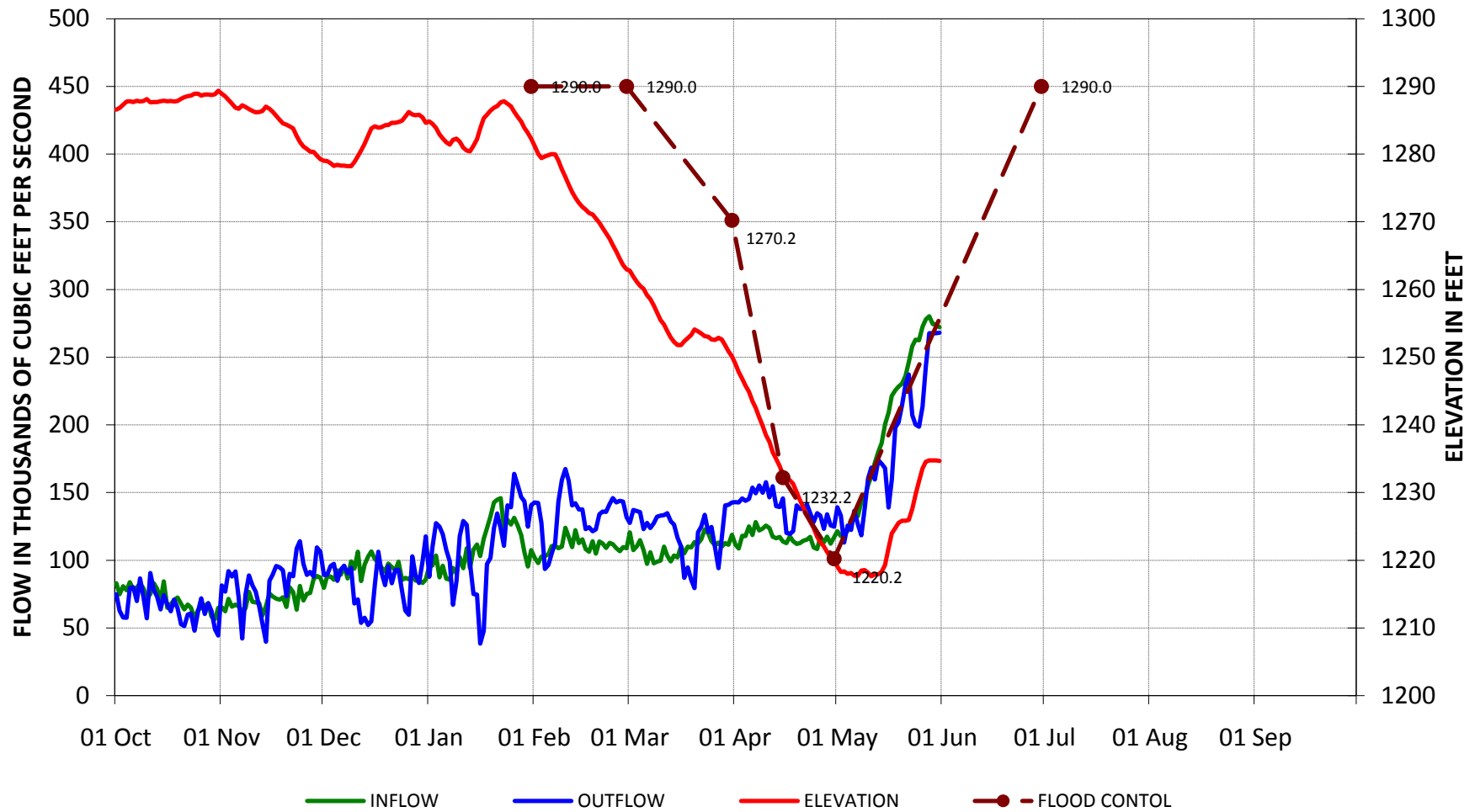
ALBENI FALLS DAM AND RESERVOIR

Water Year 2011



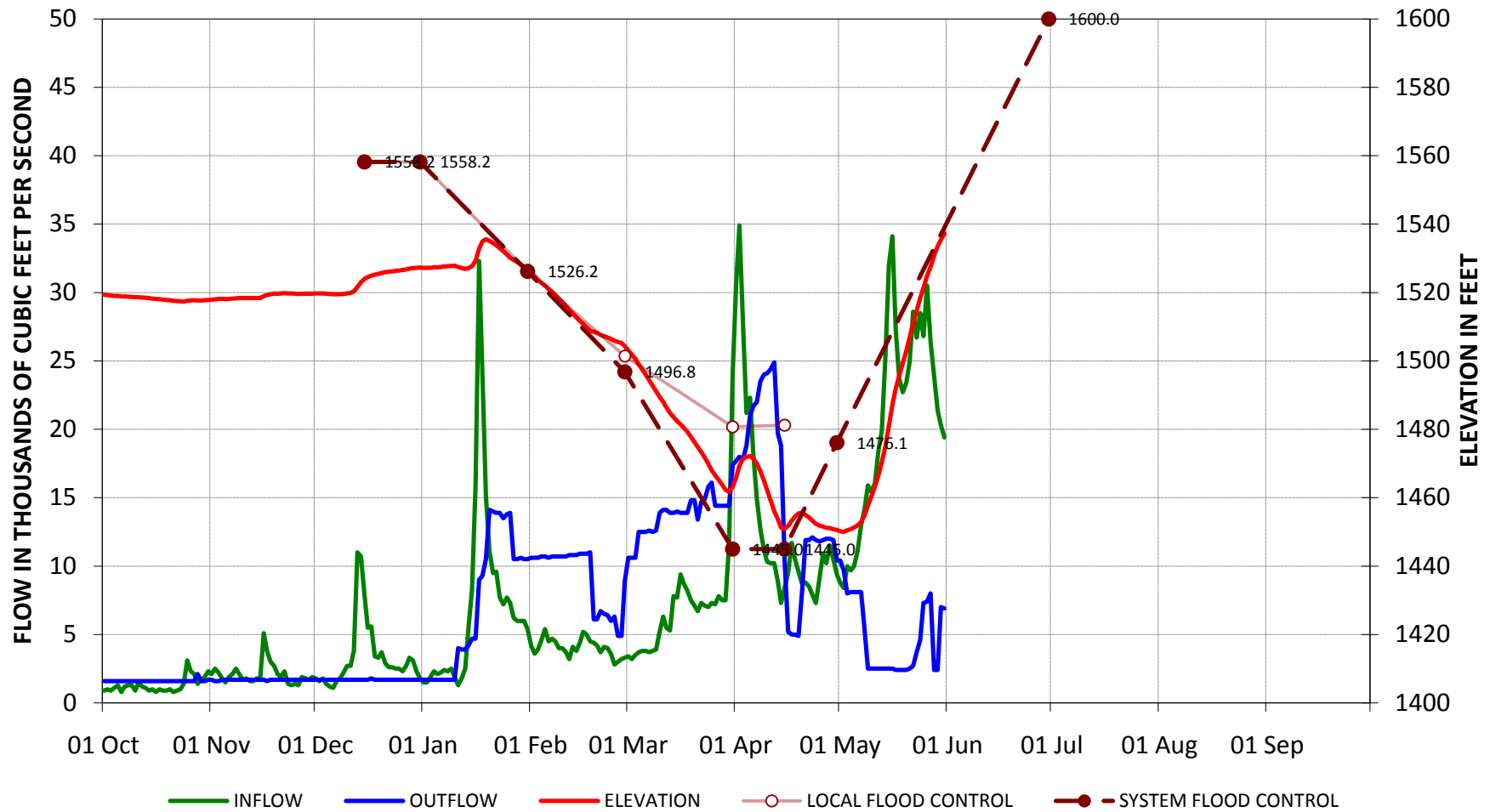
GRAND COULEE DAM AND RESERVOIR

Water Year 2011

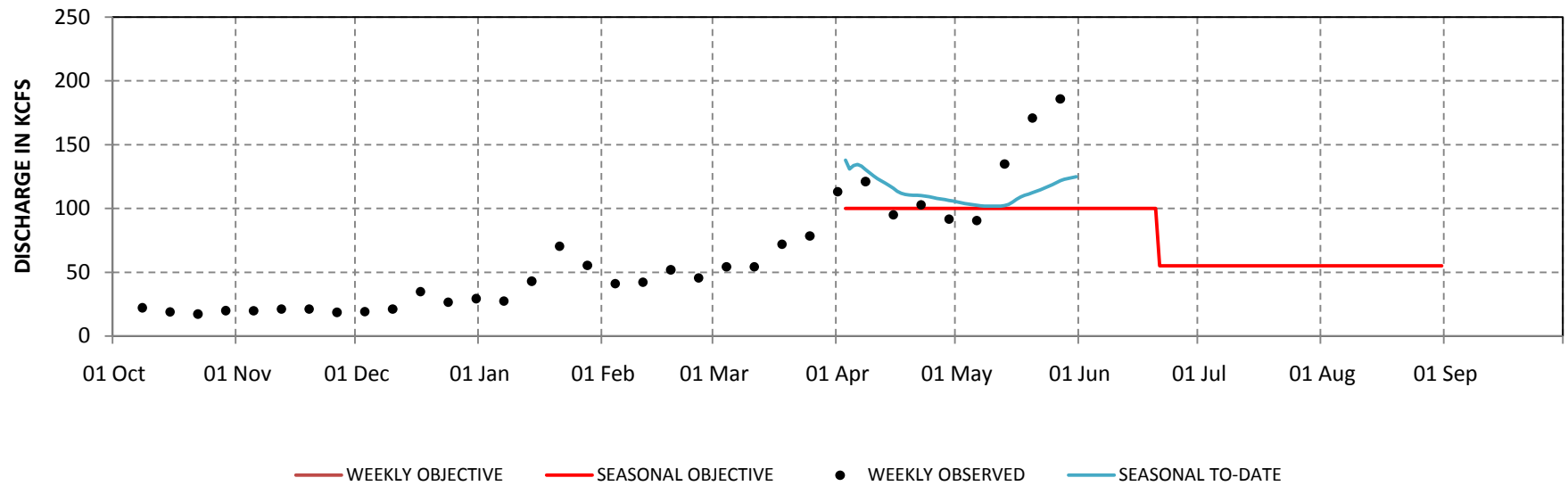


DWORSHAK DAM AND RESERVOIR

Water Year 2011

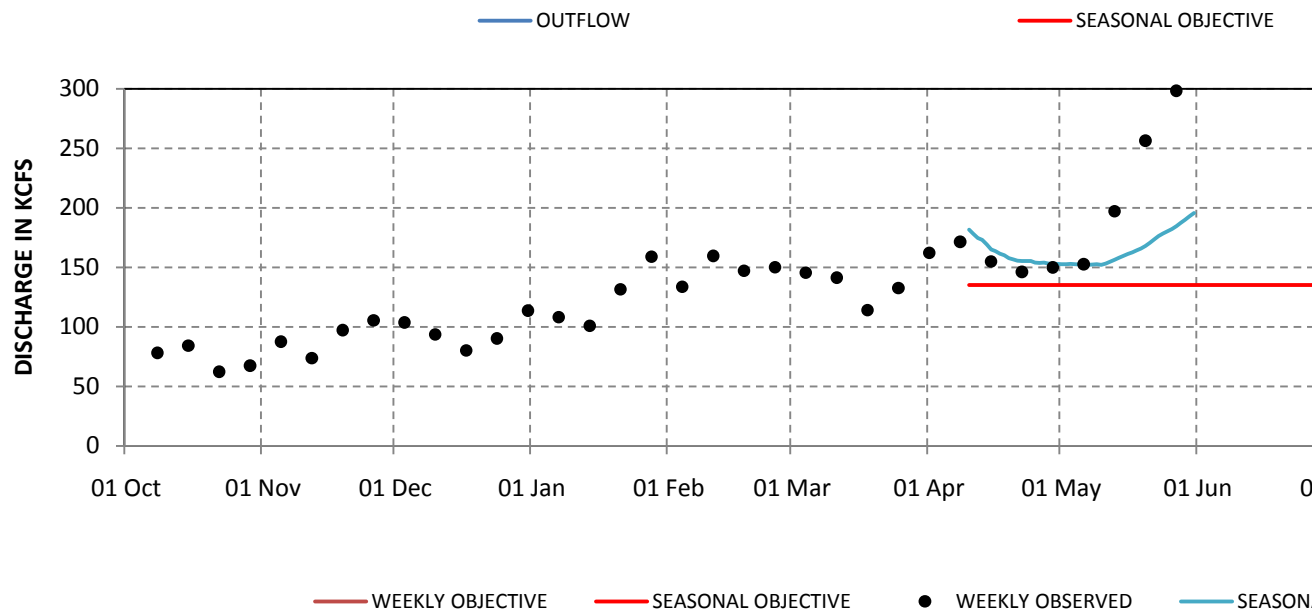
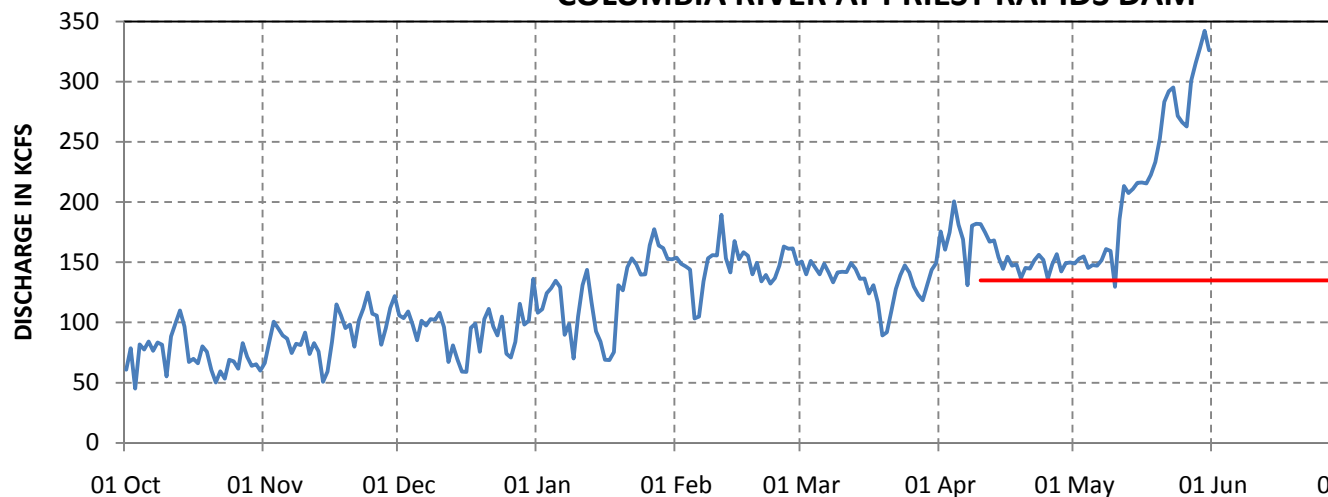


PROJECT DISCHARGE SUMMARY SNAKE RIVER AT LOWER GRANITE DAM

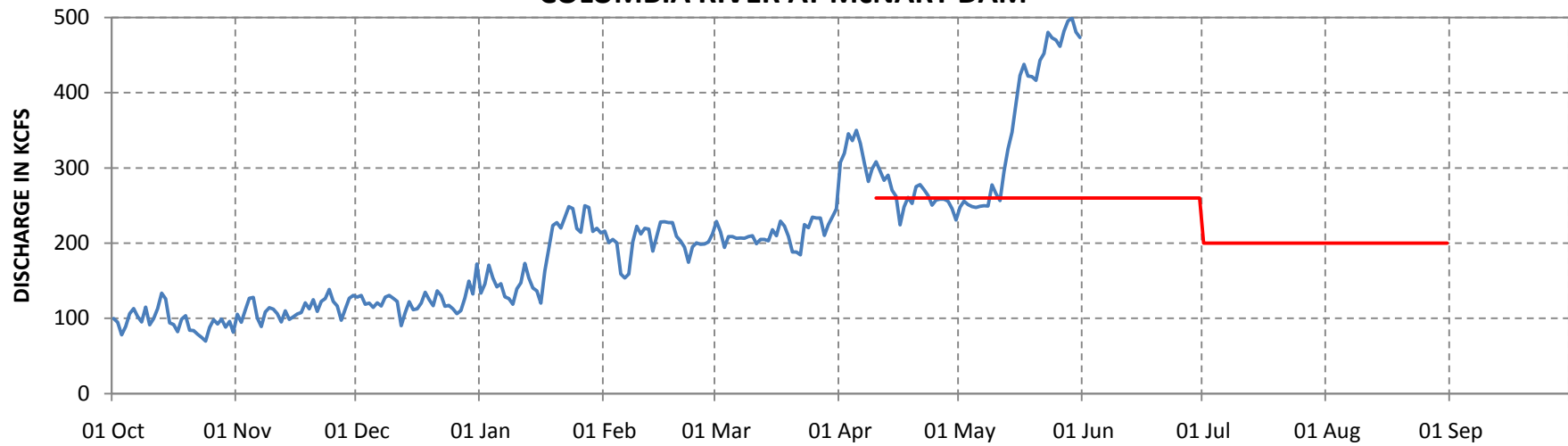


PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT PRIEST RAPIDS DAM

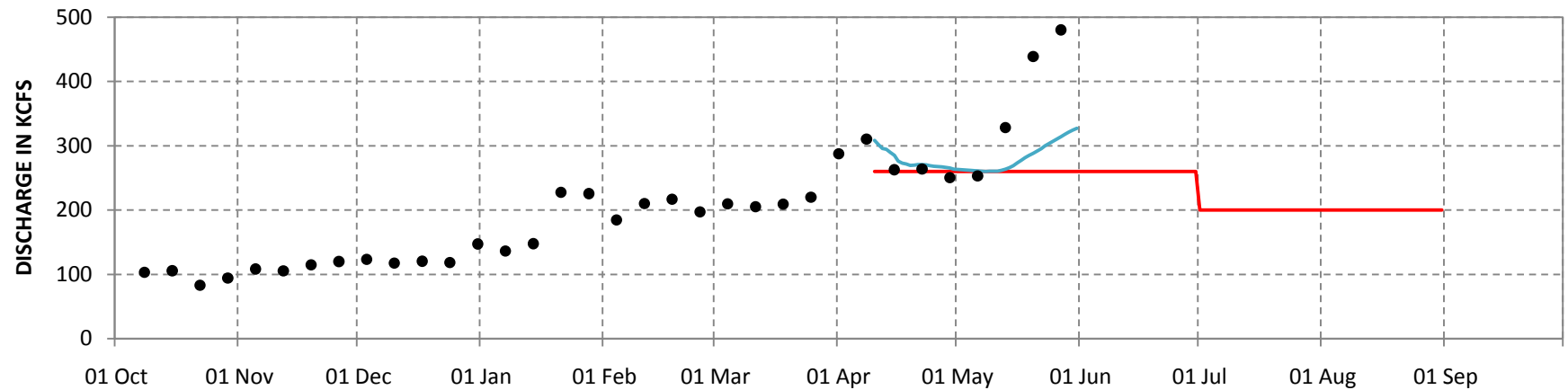


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT McNARY DAM



— OUTFLOW

— SEASONAL OBJECTIVE



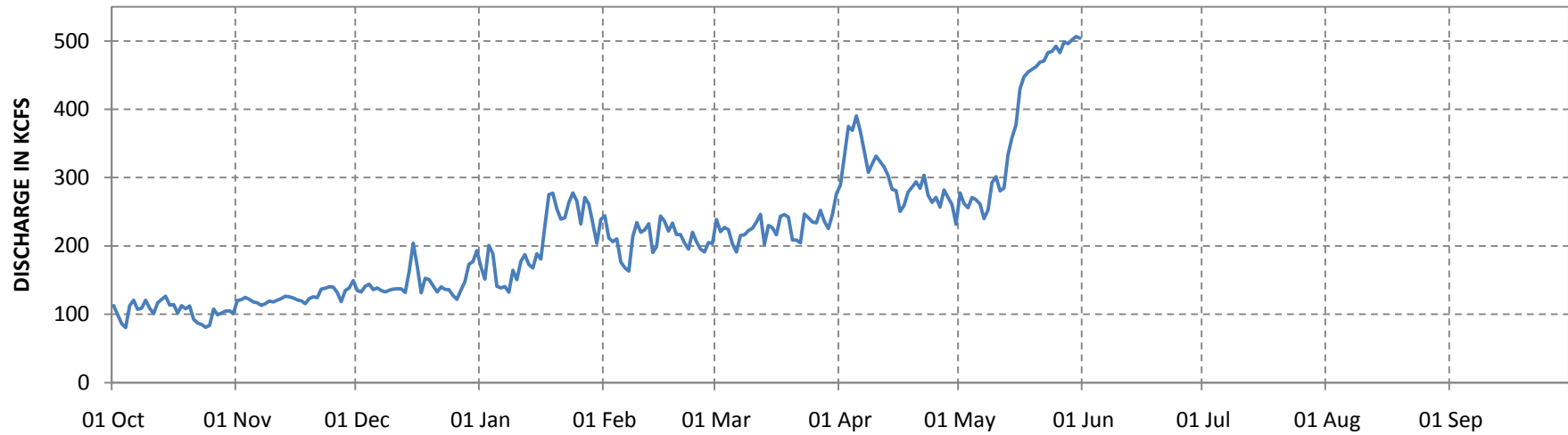
— WEEKLY OBJECTIVE

— SEASONAL OBJECTIVE

● WEEKLY OBSERVED

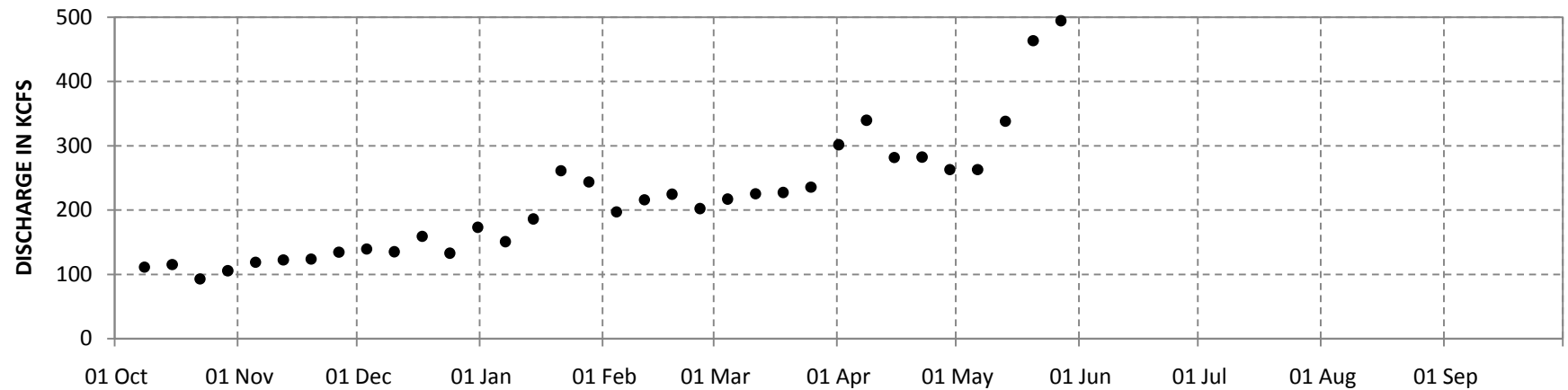
— SEASONAL TO-DATE

PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT BONNEVILLE DAM



— OUTFLOW

— SEASONAL OBJECTIVE



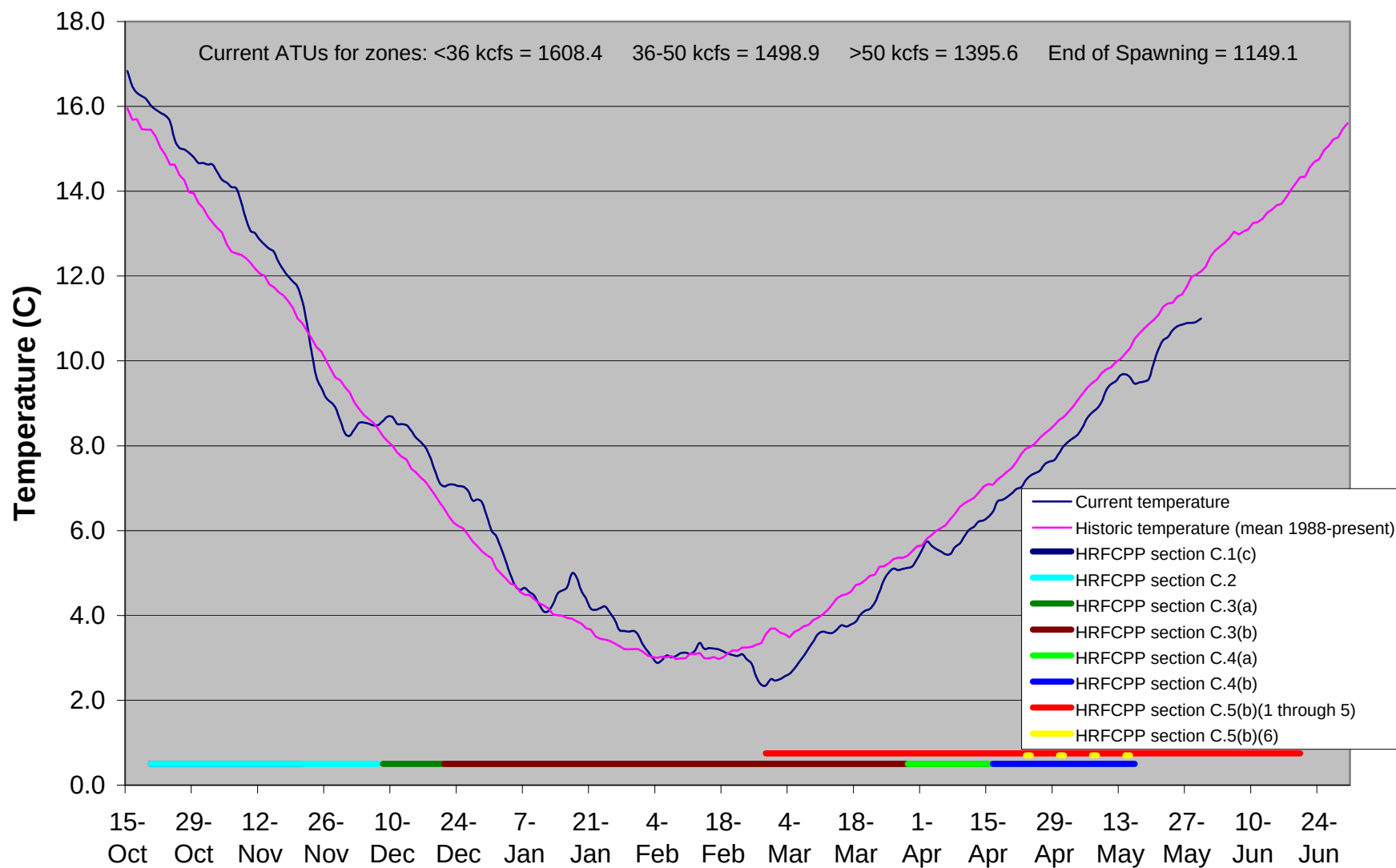
— WEEKLY OBJECTIVE

— SEASONAL OBJECTIVE

● WEEKLY OBSERVED

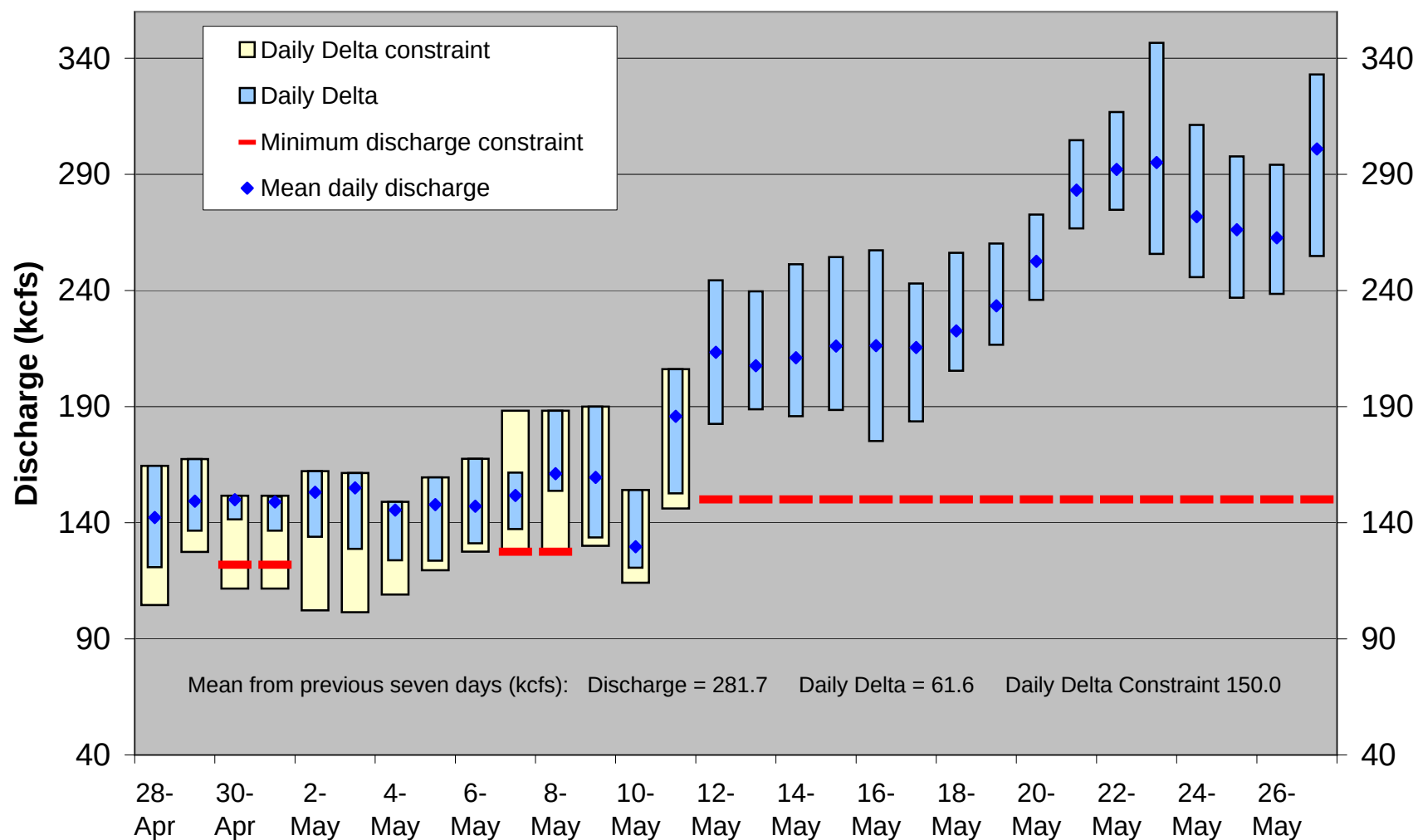
— SEASONAL TO-DATE

2010-2011 PRD Tailrace Temperatures and HRF CPP constraints



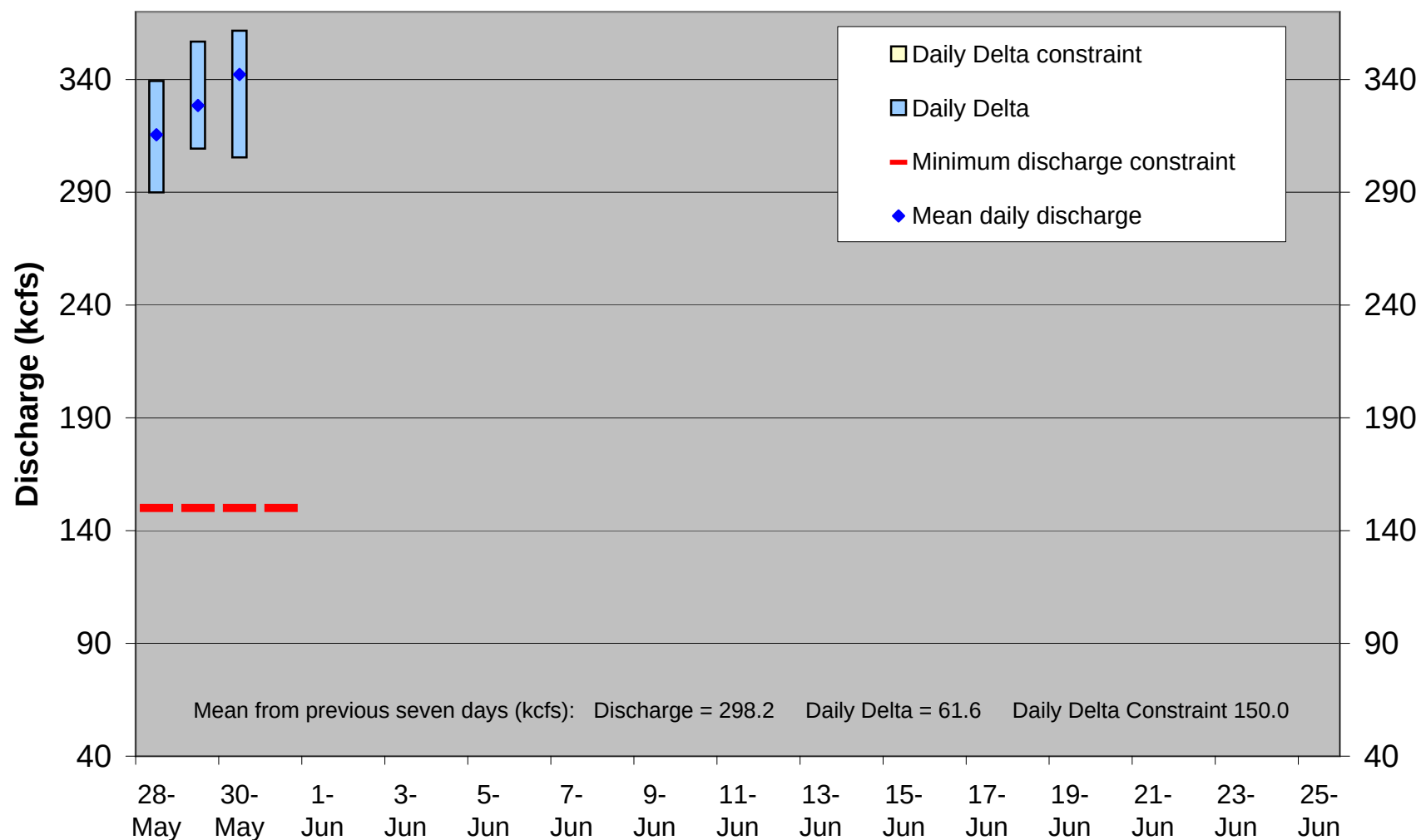
Priest Rapids Dam Operations 2011

Number of exceedances: 0



Priest Rapids Dam Operations 2011

Number of exceedances: 0



TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday June 8, 2011 9:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Libby Operations - Steve Barton, COE-NWD
3. Other
 - a. Set agenda and date for next meeting - **June 15, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

LEVEL 2 SPILL (120% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN
- 2) JDA
- 3) TDA
- 4) LGS
- 5) IHR
- 6) LWG
- 7) MCN
- 8) BON
- 9) CHJ
- 10) DWR UP TO 37%
- 11) GCL UP TO -- (110% TDG SPILL CAP)

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
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Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday June 15, 2011 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6845

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AGENDA

1. Welcome and Introductions
2. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality
 - i. [May TDG Instances Report](#)
3. SOR 2011 C-1 Treaty Fishery - Tom Lorz, CRITFC/Umatilla
 - a. [SOR 2011 C-1](#)
4. Other
 - a. Set agenda and date for next meeting - **June 22, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

TDG INSTANCE TYPES

May 1 – May 31, 2011

Instances of when TDG levels exceed state water quality standards are classified into “types” which are shown on Table 1. These types are regionally approved and have been used since 2003. The states have requested information on TDG instances which include:

1. Date and times of exceedance
2. Amount of exceedance in percent saturation
3. Explain reason for exceedance
4. Discuss steps taken to fix the problem.

Because TDG instances are events when state TDG standards are exceeded, it is necessary to describe the current legal arrangement of how the state water quality standards are being implemented by the USACE. The March 24, 2011 Spring Operations Court Order requires the Corps to operate according to the 2006 fixed monitoring station (FMS) system, and the 2006 state water quality standards which is referred to as “Roll-Over”. Therefore, the Camas/Washougal FMS, and the Oregon high 12-hour average calculation method are used to manage spill.

During the spill for fish passage season from April through August the Washington Department of Ecology (WDOE) has issued a temporary %TDG Rule Adjustment to their current water quality standards and Oregon Department of Environmental Quality (ODEQ) issued a 5-year %TDG Waiver. The state water quality standards are calculated differently from one another, and also from the 2006 Roll-Over.

USACE is currently tracking and recording the current state water quality standards as follows.

Oregon: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/or/201104.html

Washington: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/wa/201104.html

Comparison of OR & WA: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/201104.html

Table 2 provides the TDG instances according to the Oregon high 12-hour average calculation method that occurred in the May 2011 spill for fish passage season.

Table 3 lists the project 7Q10 flows criteria which define when water quality standards no longer apply. Table 3 also shows when the 7Q10 flow criteria were exceeded during May 2011, which are the highlighted areas and provides the average daily flows for the lower Columbia and Snake River projects.

Table 1

Types of Instance	
Type 1 Condition	TDG levels exceed the TDG standard due to exceeding powerhouse capacity at run-of-river projects resulting in spill above the BiOp fish spill levels. This condition type includes:
	• High runoff flows and flood control efforts. • BPA load requirements are lower than actual powerhouse capacity. • Involuntary spill at Mid Columbia River dams resulting in high TDG levels entering the lower Columbia River. • Involuntary spill at Snake River dams resulting in high TDG levels entering the lower Columbia River.
Type 1a Condition	Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.
Type 2 Exceedance	TDG exceedances due to the operation or mechanical failure of non-generating equipment. This exceedance type includes:
	• Flow deflectors unable to function for TDG abatement with tailwater elevations above 19 - 26 feet at Bonneville Dam. • Spill gates stuck in open position or inadvertently left open. • Increased spill in a bulk spill operation to pass debris. • Communication errors, such as teletype were transmitted but change was not timely made or misinterpretation of intent of teletype by Project operator.
Type 2a Exceedance	Malfunctioning FMS gauge, resulting in fewer TDG or temperature measurements when setting TDG spill caps.
Type 3 Exceedance	TDG exceedances due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This exceedance type includes:
	• Uncertainties when using best professional judgment to apply the spill guidance criteria, e.g., travel time, degassing, and spill patterns. • Uncertainties when using the SYSTDG model to predict the effects of various hydro system operations, temperature, degassing, and travel time. • Uncertainties when using forecasts for flows, temperature and wind. • Unanticipated sharp rise in water temperature (a 1.5 degree F. or greater change in a day). • Bulk spill pattern being used which generated more TDG than expected.

Table 2
Types of TDG Instances
May 2011

DATE	Lower Granite Forebay	Lower Granite Tailrace	Little Goose Forebay	Little Goose Tailrace	Lower Monum. Forebay	Lower Monum. Tailrace	Ice Harbor Forebay	Ice Harbor Tailrace	McNary Forebay	McNary Tailrace	John Day Forebay	John Day Tailrace	The Dalles Forebay	The Dalles Tailrace	Bon Forebay	Bon Tailrace	Camas Forebay
5/1/2011	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/2/2011	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
5/3/2011	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/4/2011	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/5/2011	---	---	---	---	---	---	1	---	---	---	---	---	---	---	1	---	---
5/6/2011	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---
5/7/2011	---	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---
5/8/2011	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
5/9/2011	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
5/10/2011	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	1	---
5/11/2011	---	---	---	---	---	1	1	---	---	---	---	---	---	---	---	---	---
5/12/2011	---	---	---	---	---	1	---	---	---	---	---	---	---	---	---	---	---
5/13/2011	---	---	---	---	---	1	1	---	---	1	---	---	---	---	1	1	---
5/14/2011	---	1	---	1	1	1	1	1	1	1	---	---	---	---	1	1	1
5/15/2011	---	1	---	1	1	1	1	1	1	1	---	---	---	---	---	1	1
5/16/2011	---	1	1	1	1	1	1	1	---	1	---	1	---	---	---	1	1
5/17/2011	---	1	1	1	1	1	1	1	1	1	---	1	---	---	1	1	1
5/18/2011	---	1	1	1	1	1	1	1	1	1	---	N/A	---	---	1	1	1
5/19/2011	---	1	1	1	1	1	1	1	1	1	N/A	N/A	1	1	1	2a	1
5/20/2011	---	1	1	1	1	1	1	1	1	1	N/A	N/A	1	1	1	2a	1
5/21/2011	---	1	1	1	1	1	1	1	1	1	N/A	N/A	1	1	1	2a	1
5/22/2011	---	1	1	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/23/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/24/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/25/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/26/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/27/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/28/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/29/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/30/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5/31/2011	---	1	1	1	1	1	1	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Total	0	18	16	18	18	24	23	18	8	10	0	2	3	3	8	20	8
MAY GRAND TOTAL = 197																	

N/A means that the TDG instances in the project forebay and tailwater are not counted since the project flow exceeded the 7Q10 flows.

Table 3
Days 7Q10 Daily Average Flows Were Exceeded
May 2011

Date	LWG (kcfs)	LGS (kcfs)	LMN (kcfs)	IHR (kcfs)	MCN (kcfs)	JDA (kcfs)	TDA (kcfs)	BON (kcfs)
7Q10 Flow Criteria	214	214	214	214	447	454	461	467
5/15/2011	140.2	134.2	139.0	143.2	347.3	351.8	338.0	358.8
5/16/2011	175.3	167.7	173.5	175.2	385.8	383.6	366.7	377.0
5/17/2011	203.4	195.4	209.7	213.8	422.9	438.6	423.5	430.3
5/18/2011	188.7	183.4	198.7	202.1	437.8	454.9	442.3	447.5
5/19/2011	173.0	164.3	173.2	178.7	422.0	457.9	445.0	454.3
5/20/2011	158.6	152.6	160.6	166.9	421.5	463.9	450.0	458.6
5/21/2011	158.7	147.0	155.4	160.9	416.4	467.3	451.2	462.1
5/22/2011	163.2	155.9	162.2	168.6	443.0	474.3	461.1	468.9
5/23/2011	171.0	163.0	169.9	174.3	452.2	476.7	457.1	470.7
5/24/2011	182.6	173.2	180.8	186.9	480.2	493.6	471.7	483.0
5/25/2011	187.6	174.1	189.2	191.9	473.1	495.3	477.8	484.7
5/26/2011	196.1	178.4	193.5	198.4	470.1	490.8	476.6	492.3
5/27/2011	200.0	182.7	200.2	204.2	461.7	483.0	462.1	482.7
5/28/2011	201.7	186.8	206.8	209.2	481.9	501.7	486.5	498.1
5/29/2011	182.3	167.3	184.4	190.9	495.5	507.7	491.9	496.2
5/30/2011	171.7	158.7	171.1	178.3	499.4	518.3	497.3	501.5
5/31/2011	162.1	148.2	158.4	163.8	480.6	509.1	494.5	506.5

The gray highlighted days represent when the 7Q10 flow criteria were exceeded.
7Q10 is the average peak annual flow for seven consecutive days that has a
recurrence interval of ten years and they are established in the TMDLs

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 15, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

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Operations Review

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season forecast. 66,000 jacks had been counted, and this number was much higher than the pre-season forecast. Sockeye counts at Bonneville were about 1,000. Summer Chinook counts, which began on 6/1, were so far well above the 10-year average. The timing of sockeye adults was tracking closely with last year, though the size of the run as compared with last year remains to be seen. Paul Wagner, NOAA, noted that no issues appeared to have come from the operational changes that occurred due to an outage at Little Goose earlier in the season. Dave Statler, Nez Perce Tribe, reported that adult lamprey counts are very low, just 461 total to date at Bonneville. Paul Wagner also reported on the juvenile migration. The yearling Chinook and steelhead migration was very near the end. Subyearling counts were 15,000 to 30,000 per day at Lower Granite. Juvenile lamprey passage was very low in the Snake River, 5,000 at McNary and 1,000 at John Day. Counts were also very low at Bonneville, with no fish screens currently installed at the project.

Paul also shared the latest gas bubble trauma report. The main issue, he said, is at Rock Island, as this has been the place that GBT has been consistently high (21%) and included rank 1 and 2 level trauma.

Water quality – Laura Hamilton, COE, reported that TDG levels were high throughout the Columbia Basin due to the high flows. In May, the exceedance type was associated with flood control and ‘7Q10 flows’, which she described as flows at which TDG standards no longer apply. This exceedance was reflected as ‘N/A’ on the exceedance table.

Power system – Nothing to report.

Other – Steve Barton, COE, reported that units 1-5 at Little Goose are back on line, and unit 6 will be back by the end of July.

SOR 2011-C-1

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Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 15, 2011

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<i>Name</i>	<i>Affiliation</i>
Jim Litchfield	Montana
John Roache	BOR
Laura Hamilton	COE
Doug Baus	COE
Lisa Wright	COE
Paul Wagner	NOAA
Steve Barton	COE
Kim Johnson	COE

Phone:

Tony Norris	BPA
Cindy Lefleur	Washington
Russ Kiefer	Idaho
Tom Lorz	CRITFC/Umatilla
Scott Bettin	BPA
Shane Scott	PPC
Tim Heizenrader	Centaurus
Bruce McKay	consultant
Barry Espenson	CBB
Margaret Filardo	FPC
Dave Benner	FPC
Bill Rudolph	NW Fish Letter
Tom Le	Puget Sound Energy
Doug Vine	Thompson Reutters
Alex Cibarra	Grant PUD
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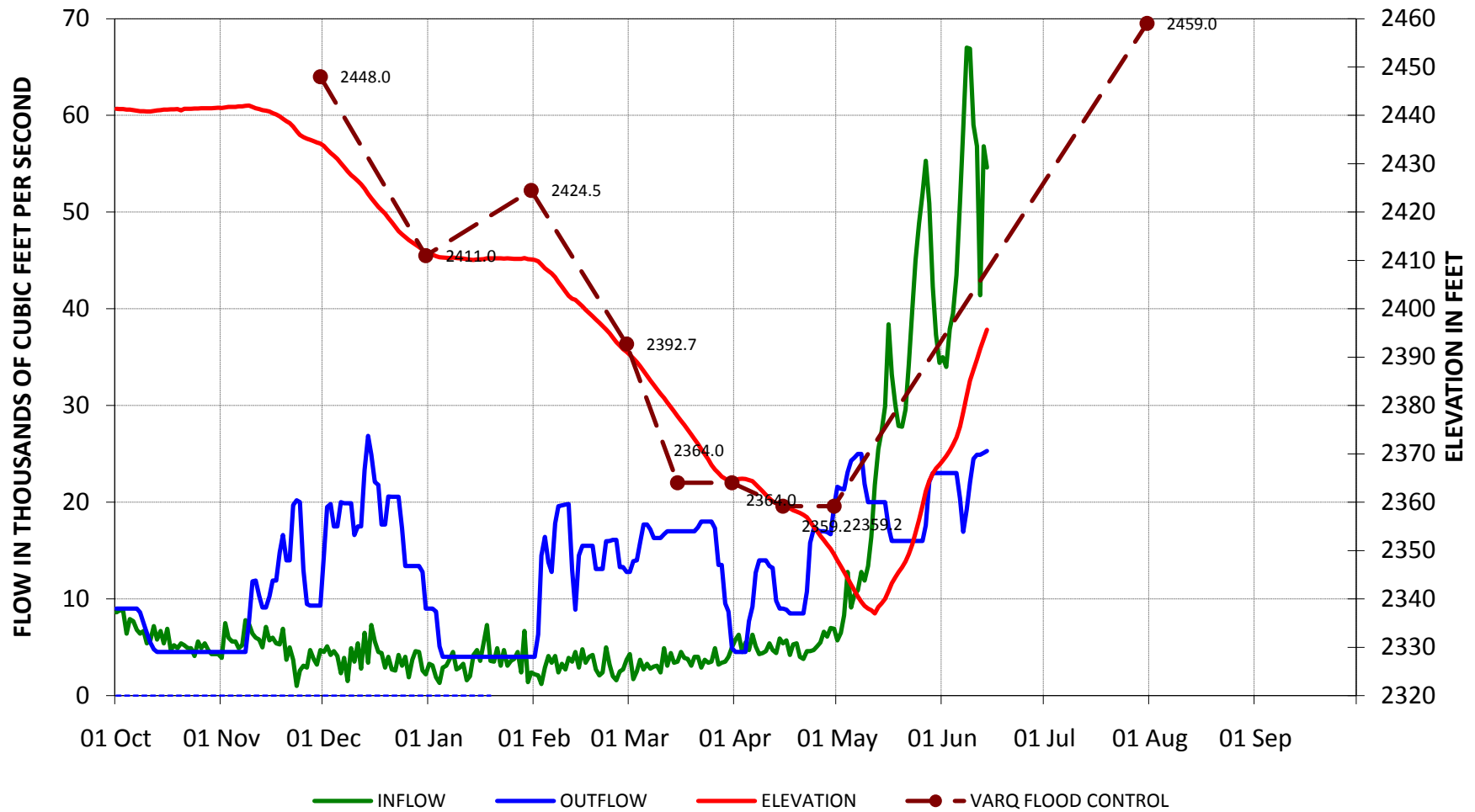
<i>Name</i>	<i>Affiliation</i>
Jim Litchfield	Montana
John Roache	BOR
Laura Hamilton	COE
Doug Baus	COE
Lisa Wright	COE
Paul Wagner	NOAA
Steve Barton	COE
Kim Johnson	COE

Phone:

Tony Norris	BPA
Cindy Lefleur	Washington
Russ Kiefer	Idaho
Tom Lorz	CRITFC/Umatilla
Scott Bettin	BPA
Shane Scott	PPC
Tim Heizenrader	Centaurus
Bruce McKay	consultant
Barry Espenson	CBB
Margaret Filardo	FPC
Dave Benner	FPC
Bill Rudolph	NW Fish Letter
Tom Le	Puget Sound Energy
Doug Vine	Thompson Reutters
Alex Cibarra	Grant PUD
Dave Statler	Nez Perce

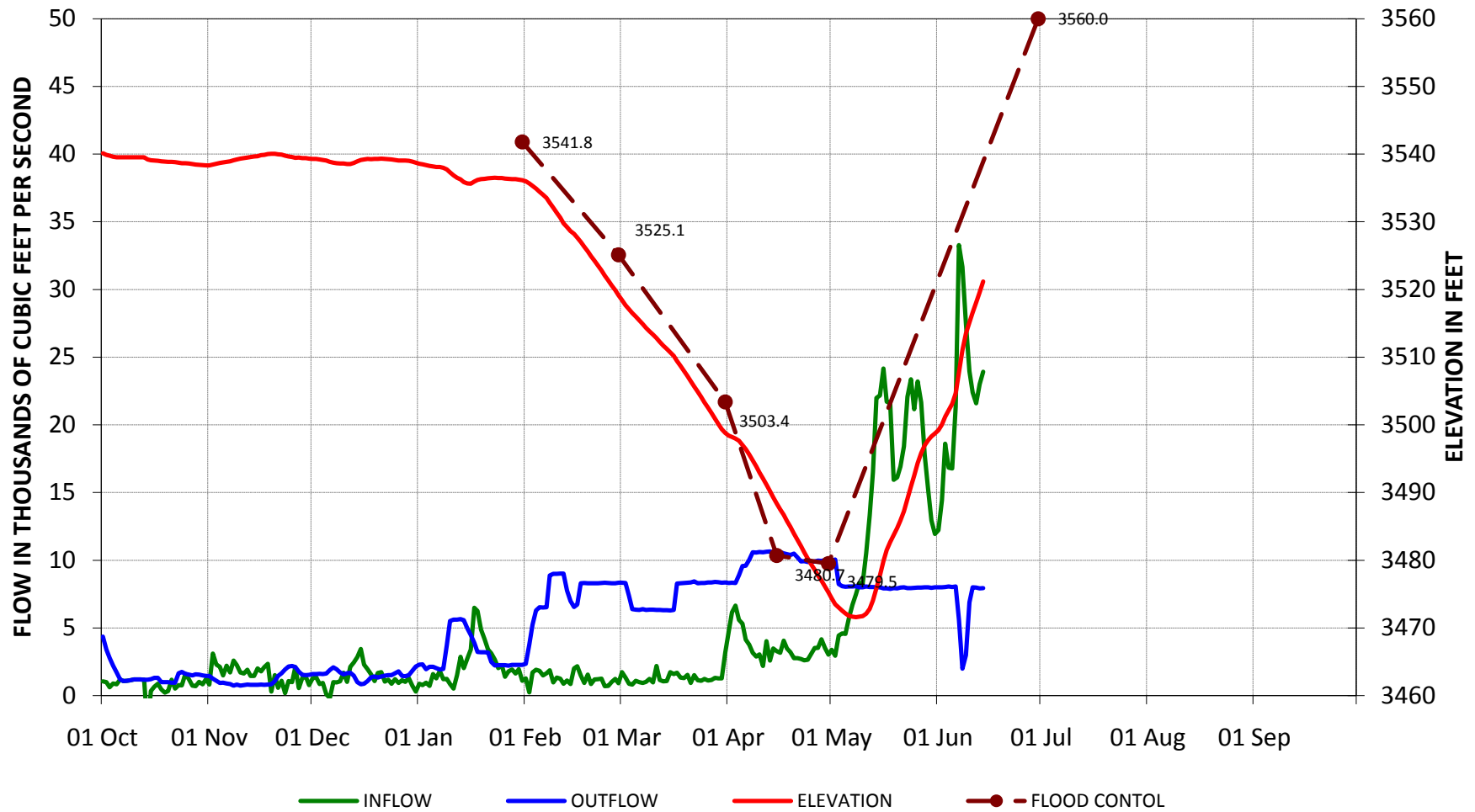
LIBBY DAM AND RESERVOIR

Water Year 2011



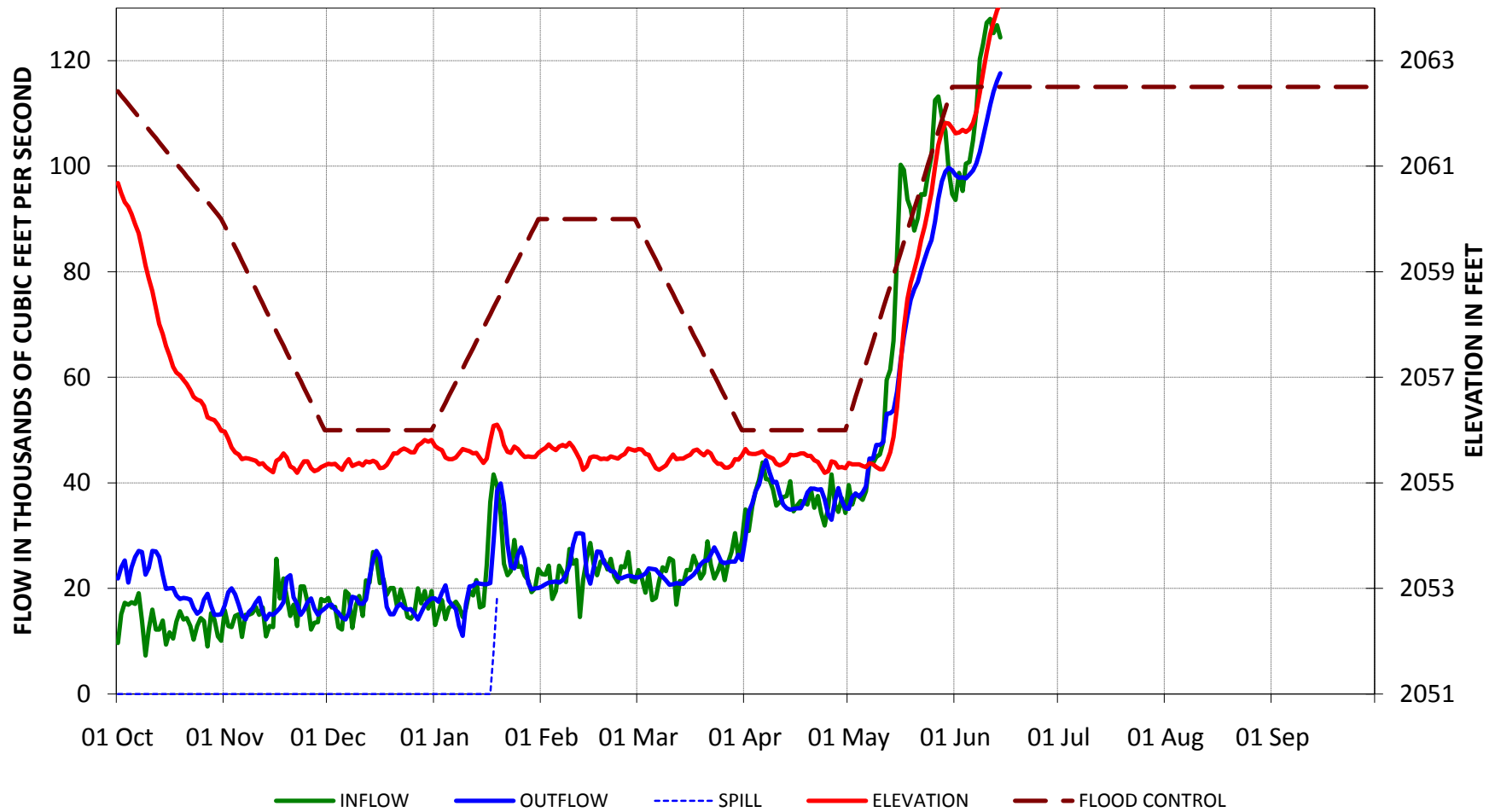
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2011



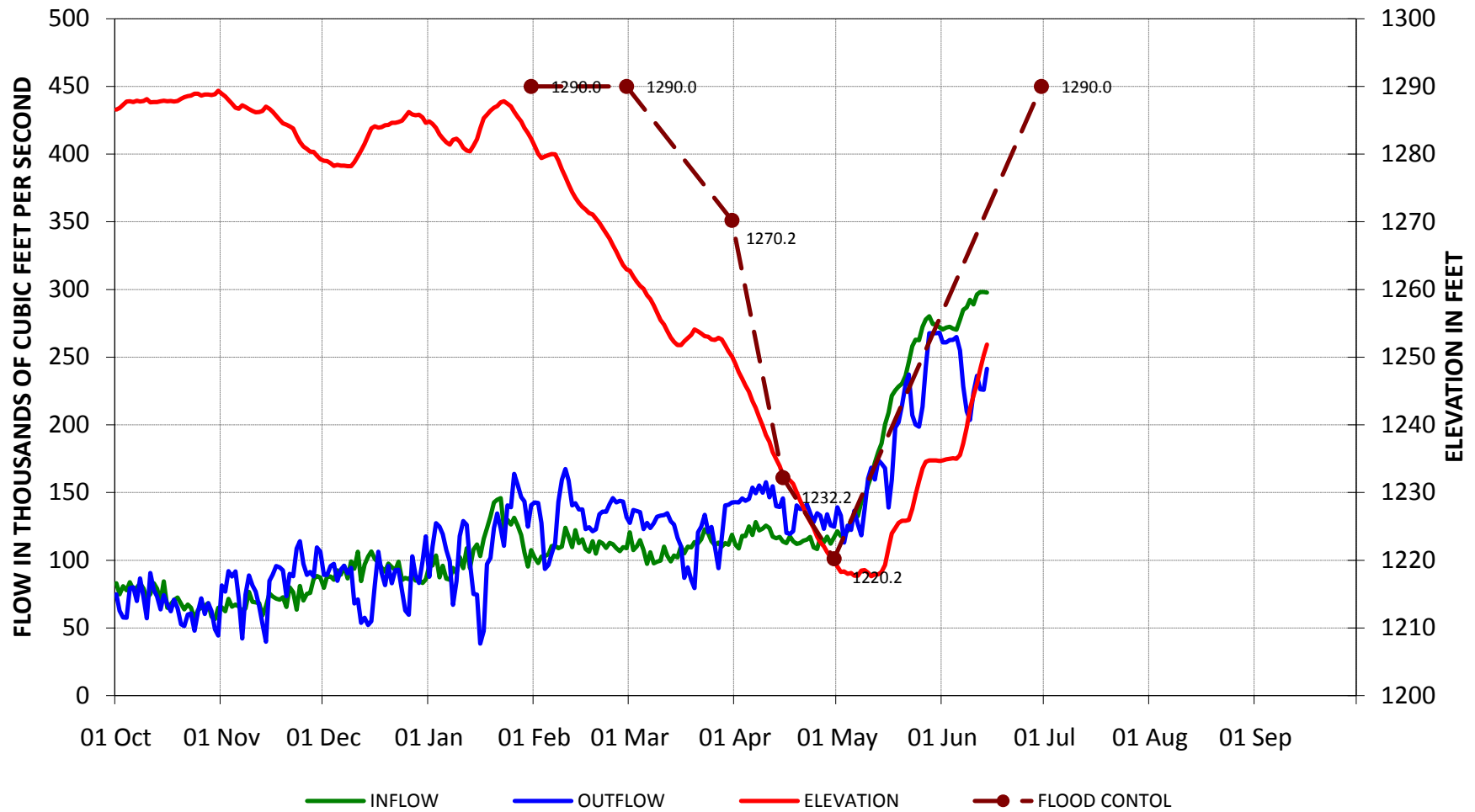
ALBENI FALLS DAM AND RESERVOIR

Water Year 2011



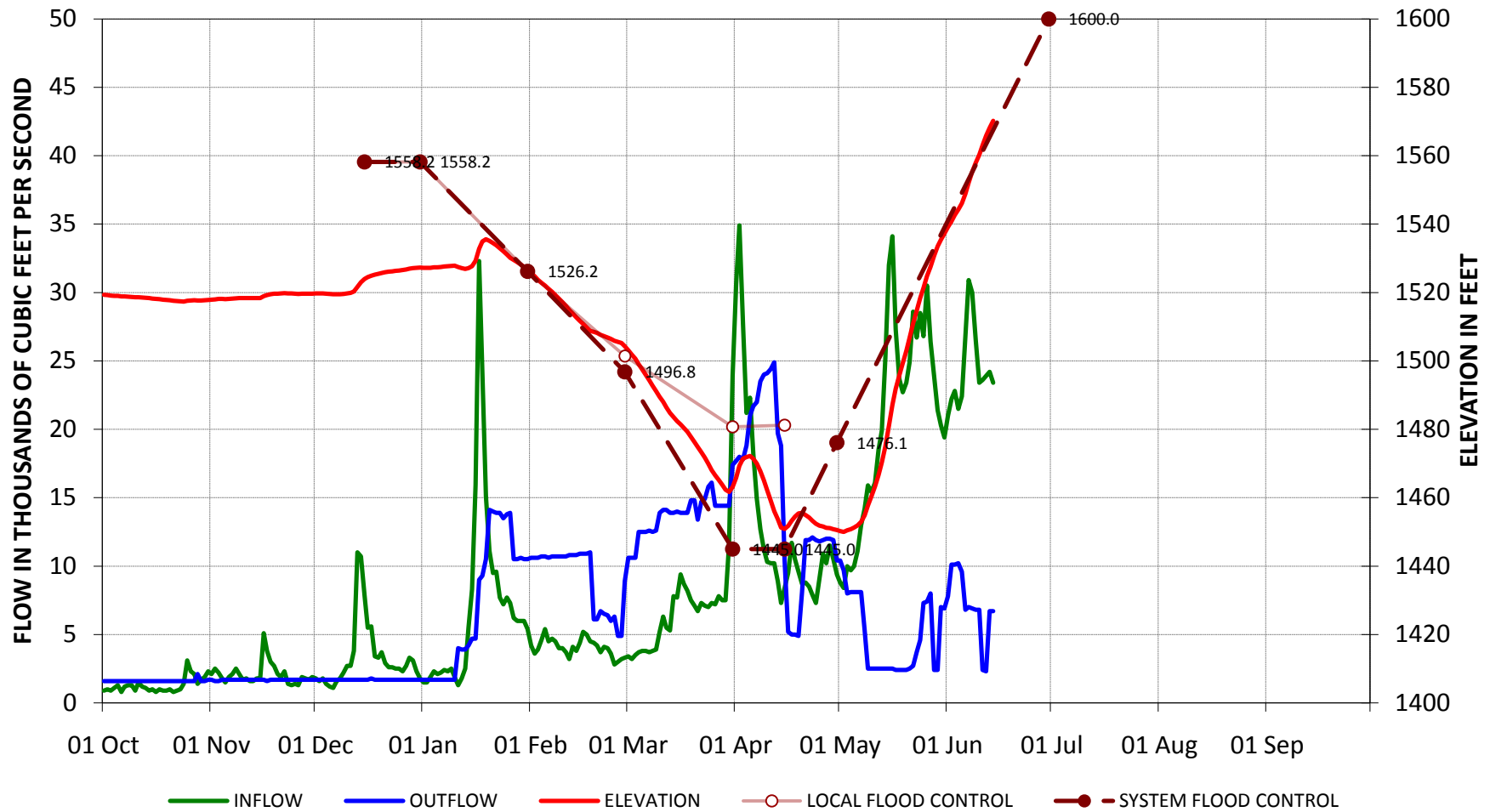
GRAND COULEE DAM AND RESERVOIR

Water Year 2011

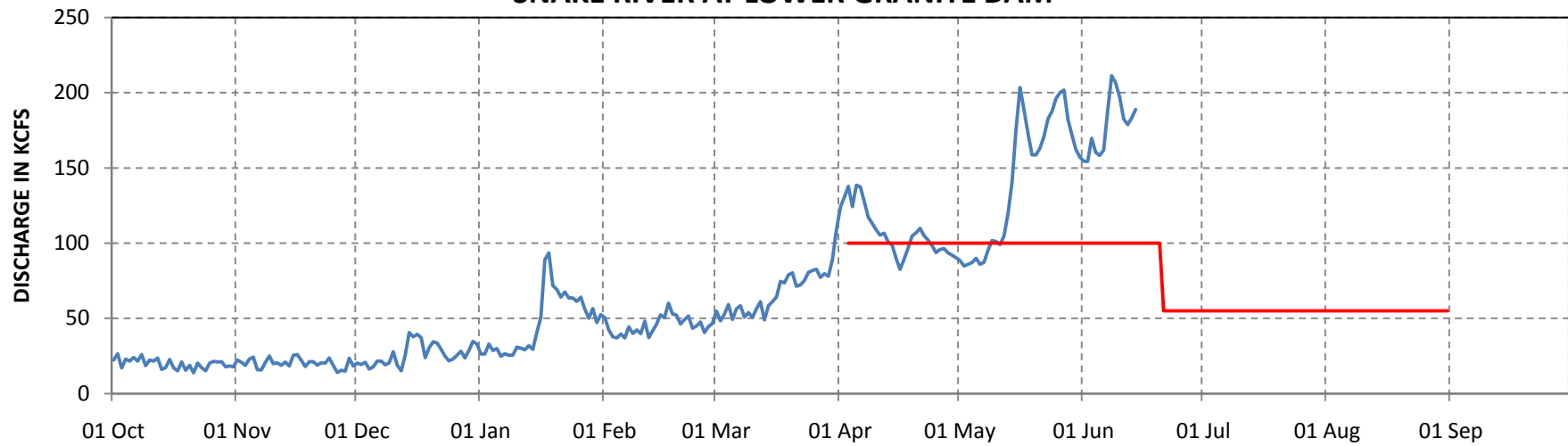


DWORSHAK DAM AND RESERVOIR

Water Year 2011

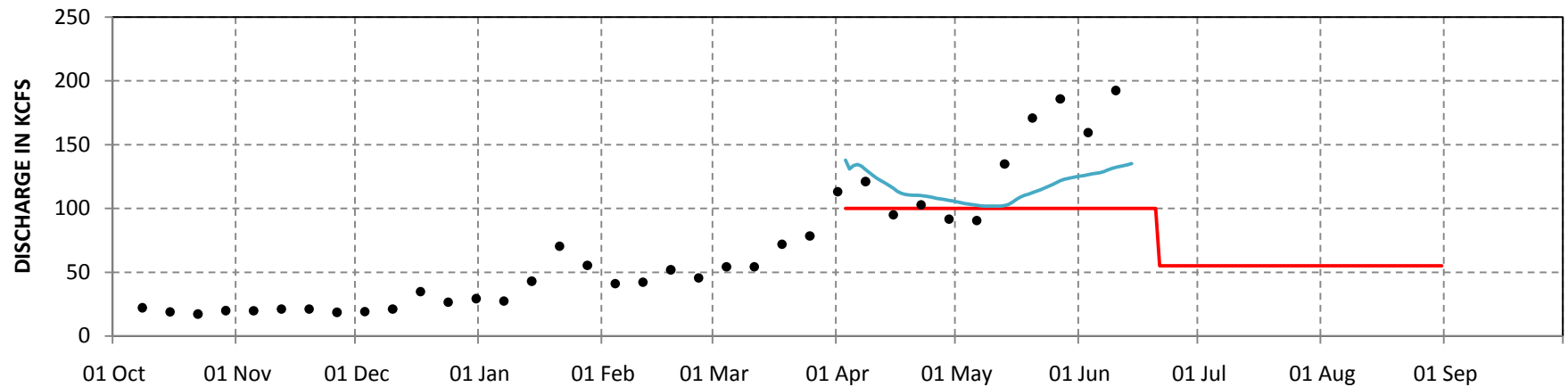


PROJECT DISCHARGE SUMMARY SNAKE RIVER AT LOWER GRANITE DAM



— OUTFLOW

— SEASONAL OBJECTIVE



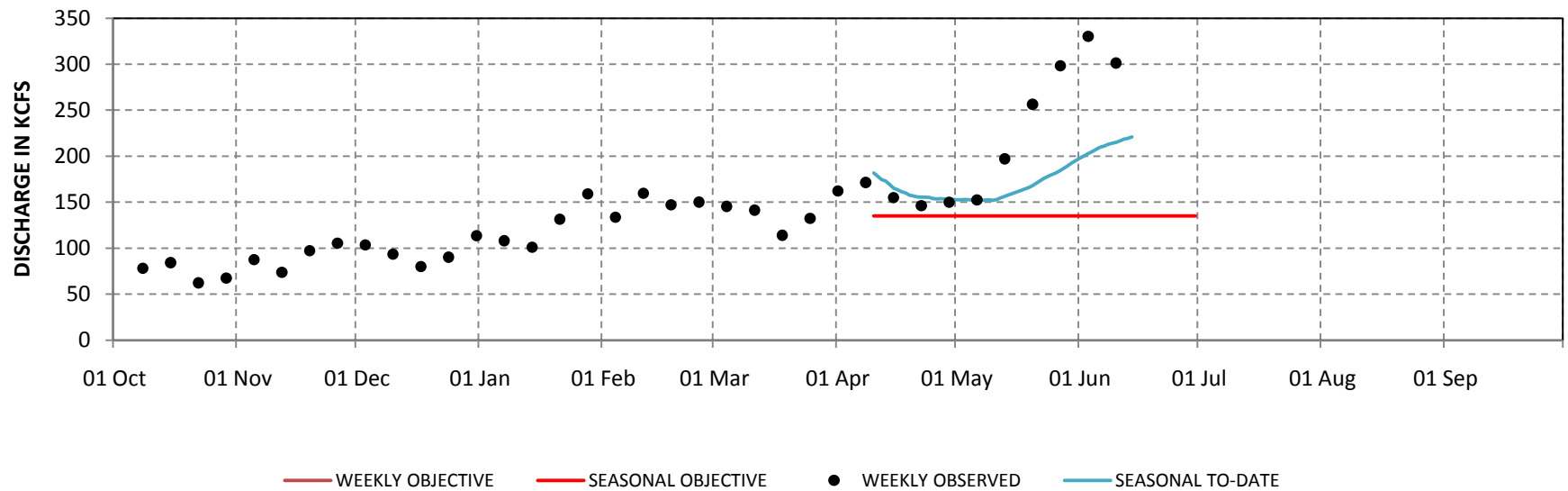
— WEEKLY OBJECTIVE

— SEASONAL OBJECTIVE

• WEEKLY OBSERVED

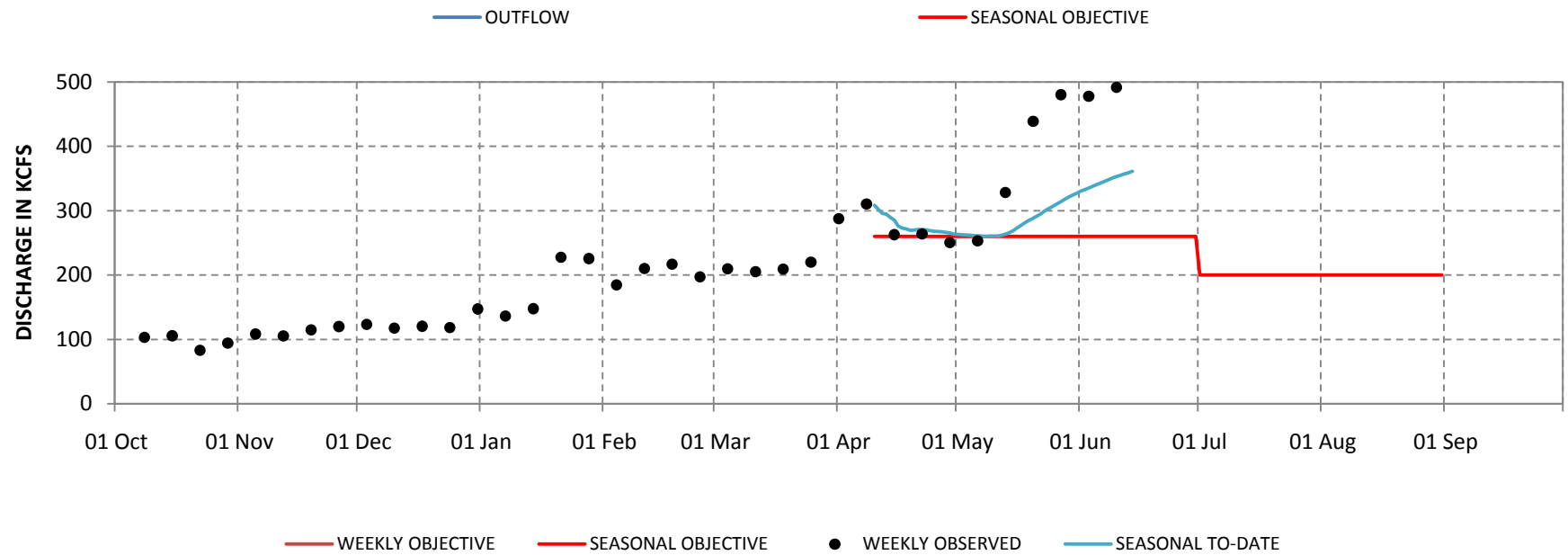
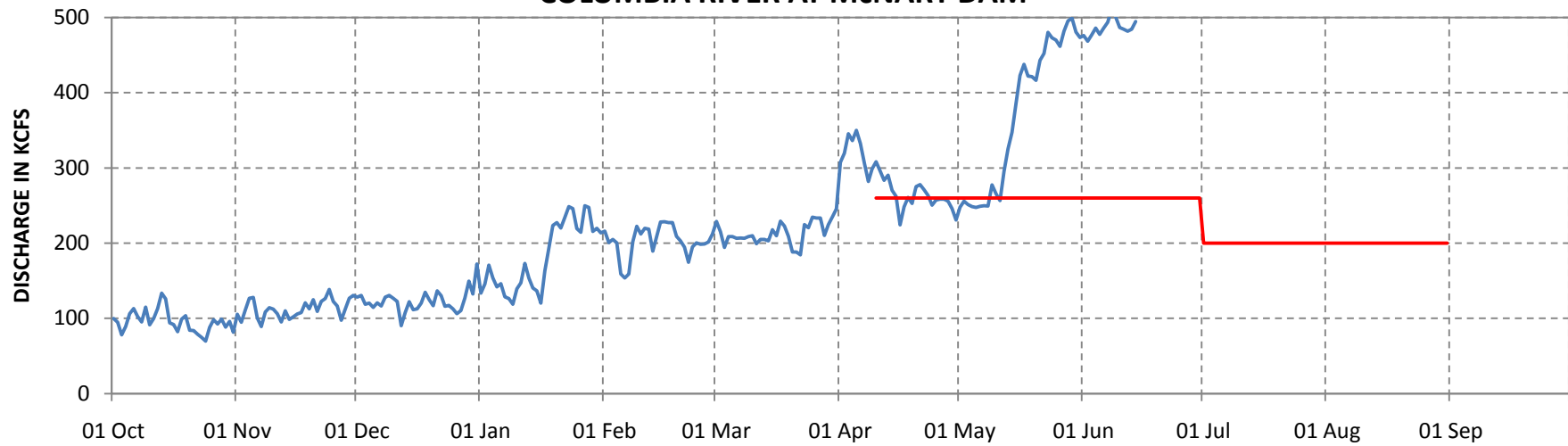
— SEASONAL TO-DATE

PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



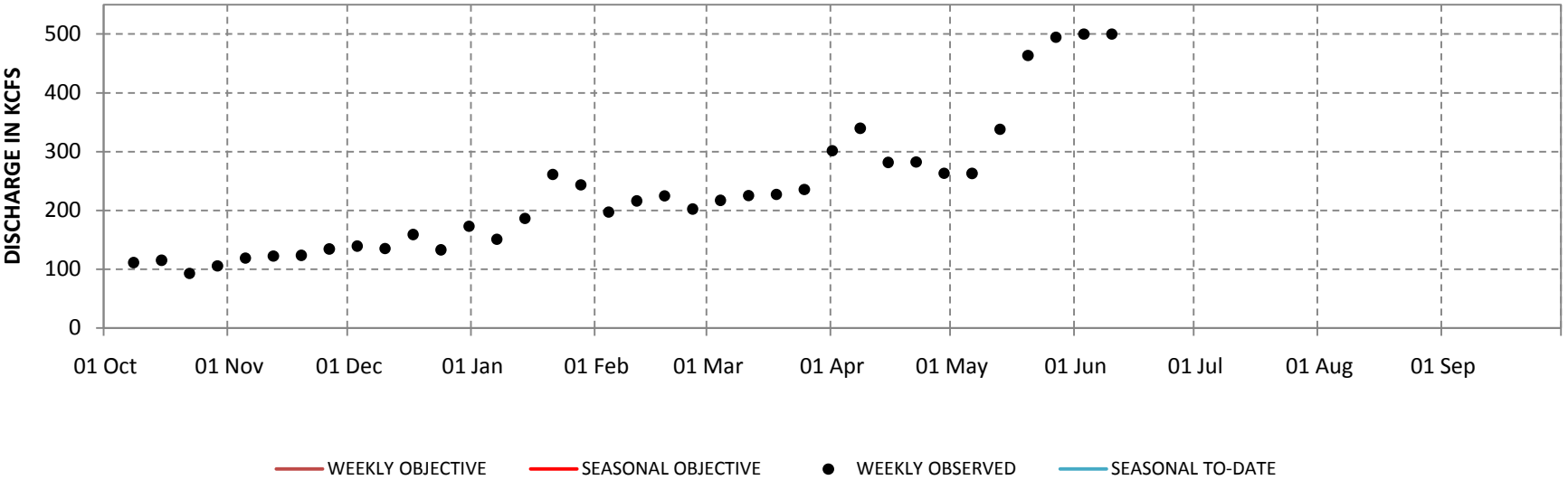
PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM



PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT BONNEVILLE DAM





COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 NE Oregon, Suite 200, Portland, Oregon 97232

Telephone 503 238 0667

Fax 503 235 4228

SYSTEM OPERATIONAL REQUEST: 2011 C-1

TO:	Brigadier General McMahon	COE-NWD
	James D. Barton	COE-NWD-NP-Water Management
	Steve Barton, Greg Bowers	COE-NWD-NP-WM-RCC
	D. Feil, R. Peters, D. Ponganis	COE-NWD-PDD (Fish Management Office)
	Col. Steven R. Miles	COE-Portland District
	Paul Cloutier	COE-Portland District (Tribal Liaison)
	Karl Wirkus	USBR- PNW Regional Director
	Steven J. Wright	BPA Administrator
	Steve Oliver, Lorri Bodi	BPA-PG-5
	Tony Norris, Scott Bettin	BPA-Operations Planning-PGPO
	Stan Speaks, Keith Hatch	BIA, Northwest Regional Office

FROM: Babtist Paul Lumley, *Executive Director*

DATE: June 14, 2011

SUBJECT: **Operation of the Lower Columbia Pools for the Summer 2011 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Confederated Tribes and Bands of the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the 2011 summer Treaty fishery. This effort supports the 2011 summer ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact. We recognize that the COE is now engaged with lower Columbia flood control operations and keeping the pools stable may have greater importance than being fixed at a specific target elevation.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

June 16, 2011, 6 am, Thursday, through 6 pm, June 18, 2011, Saturday.

June 20, 2011, 6 am, Monday, through 6 pm, June 23, 2011, Thursday.

Bonneville: Operate the pool within a 1.5 foot band during the treaty fishing period.

The Dalles (Celilo): Operate the pool within a 1.5 foot band during the treaty fishing period

John Day: Operate the pool within a 1.5 foot band during the treaty fishing period.

JUSTIFICATION:

The 2011 summer treaty fishing season is of critical importance to CRITFC's member tribes. The escapement of an estimated **80,000** (Columbia at Bonneville Dam) adult summer Chinook (above normal rank) and **161,000** sockeye (above normal rank), will create harvest opportunities for tribal fishers who will exercise their treaty rights by participating in this harvest, using platform and gillnet fishing methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week to count the nets in each Zone 6 pool. The survey data will be shared with COE-RCC staff by early afternoon of the flight day.

Achieving good river conditions through managed river operations during the treaty fishery have been the basis of past litigation that have been supported by federal courts and are consistent with the trust and fiduciary responsibilities that the federal operators have with respect to CRITFC's member tribes. Good river conditions during the treaty fishery are also consistent with the spirit of the 10-year Memorandum of Agreements signed by tribal and Corps, BPA, and BOR officials.

In past meetings with Corps officials, tribal fishers have explained that a pool fluctuation of more than 1.5 foot disrupts tribal fishery operations. Specific problems include: (1) increased local currents that sweep debris into fishing nets, (2) rapid 1-2 hour drops in water level will lead to entanglement of nets or change local currents that affect fishing success, (3) boat access problems, and (4) nets torn from their anchors if pools are raised after nets are set. Nets and gear are costly to replace and may become "ghost nets" that continue to catch fish and may negatively affect fish populations outside of the treaty fishing period.

Any delays or disruptions to tribal fishing operations caused by the excessive pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources and cultural practices. Much of the tribal fishers' annual income and food is generated during the brief treaty fishing season. The fishers have expressed to Corps officials that the loss of fishing opportunity during the extremely limited treaty fishery period cannot be replaced.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB Friday, June 17, 2011. Thank you for considering this request. Please contact Kyle Dittmer or Bob Heinith should you have any questions at (503) 238-0667.

cc: Tribal Staffs and Attorneys

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday June 22, 2011 9:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Spill Priority List Update - Doug Baus, COE-NWD
 - a. [Spill Priority List](#)
3. Other
 - a. Set agenda and date for next meeting - **June 29, 2011**
 - b. [Calendar 2011](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Doug Baus](#) at (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 22, 2011

Conference call

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

TMT members in attendance for all or part of the meeting: Doug Baus, COE; Scott Bettin, BPA; Tom Lorz, CRITFC/CTUIR; Russ Kiefer, Idaho; Rick Kruger, Oregon; Stu Levit, Salish-Kootenai Tribes; Jim Litchfield, Montana; Tony Norris, BPA; John Roache, Reclamation; Dave Statler, Nez Perce Tribe; Dave Wills, USFWS.

*NOAA Fisheries and Washington were not present for the discussion.

Spill Priority List

The COE convened today's conference call to discuss a proposed temporary change to the Spill Priority List, per coordination with BPA. Doug Baus, COE, said the change would move Chief Joseph to the top of the list in the Level 1 tier, to support lack of load conditions anticipated to occur over the next 2-3 weeks. This would improve water quality management and put operations in line with voluntary spill targets defined in the Summer Fish Operations Plan. The intent, he said, was to begin implementing this change today if there were no objections from TMT. The COE would use this list only during the lack of load period, and then revert back to the previous list.

The salmon managers asked for clarification about how this change would help manage TDG issues given that Mid-Columbia TDG levels were already running high. The COE responded that spill at Chief Joseph would serve to degas the water further downstream. BPA added that all options had been explored for addressing lack of load, and this was the only option available. With all other project powerhouses being ‘maxed out’ (including Grand Coulee), Chief Joseph was the last remaining tool for addressing lack of load conditions. The COE noted that with high flows, the tailwater gauge at Chief Joseph was not as sensitive to changes, so the Wells forebay monitor would be used to look at TDG changes. The spill caps were set at 120% (160 kcfs) at Chief Joseph. Tony Norris, BPA, said data from a June 5 spill test showed that spill at Chief Joseph did serve to degas the river below. He added that an additional benefit to this proposed change would be to minimize wind energy redispatch – as more spill could be implemented at the project.

Concerns were raised around debris issues occurring in the lower river, and more fish being put through the bypass system. The CTUIR and Oregon representatives acknowledged that TDG is an important consideration, and that their preference to manage the debris and fish passage concerns outweighed those TDG concerns at present.

Many TMT members said they would need to see more concrete data around this issue to provide an informed response to the proposed change, and Rick Kruger, Oregon, forewarned that it will be a challenge for him to coordinate up all the necessary internal chains within the short turnaround being requested.

Action/Next Steps: TMT will reconvene to discuss this issue further. The following next steps will be taken –

- COE and BPA will gather specific data to share with TMT around:
 - Chief Joseph spill volume and TDG level changes that would occur with this change;
 - Impacts to spill and TDG that would occur at other projects (in the context of total river flow);
 - Data from a 6/5 spill test at Chief Joseph that showed an impact to TDG at Wells; and
 - Environmental re-dispatch effects that would result from this operation change.
- The goal will be to email and post data to the TMT web page by noon on Thursday, 6/23.
- The salmon managers will hold an FPAC meeting to discuss the data – proposed for 3:00 pm on Thursday, 6/23.
- All TMT members will work within their own agencies/offices to review the data and help inform the next full TMT discussion on this issue.
- TMT will reconvene at 11:00 am on Friday, 6/24, to discuss a plan forward. If agreeable, the COE will implement a change before the weekend.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 22, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of the COE, Oregon, Idaho, BPA, USFWS, BOR, Montana and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Spill Priority List Update

In response to an anticipated lack of load over the next 2-3 weeks, the COE proposed today that Chief Joseph Dam be moved to the top of the spill priority list that has been previously been coordinated with TMT for level 1 spill only. One benefit of implementing this change, Baus said, would be improved ability for the COE to manage system wide TDG and increase the opportunities to achieve spilling in accordance with voluntary spill targets defined in the FOP by spilling through the Chief Joseph deflectors. Another benefit would be a reduction in the amount of wind energy that needs to be dispatched, Tony Norris, BPA, noted. All turbines at Grand Coulee and throughout the system are generating at maximum capacity, which leaves spill or environmental redispatch as the only recourse to lack of generation.

Speaking as FPAC chair, Tom Lorz, **CRITFC/Umatilla**, said the proposed change in spill priorities would exacerbate gas levels in the mid-Columbia, which has the highest gas levels now of anywhere in the system, while gas on the Snake isn't a problem. He expressed reluctance to move Chief Joseph up on the list because increased spill on the Columbia would expose fish to more injury from debris accumulating in bypass systems. It was noted that FPAC had not had an opportunity to discuss the proposal prior to this conference call and therefore couldn't provide the COE with a recommendation.

Rick Kruger, **Oregon**, agreed with Lorz's concerns and said more information is needed before he can explain this proposal to decision-makers at his agency. Lorz asked whether the COE has modeled the potential effects of this proposal. Without knowing the percentage by which TDG conditions would improve, Lorz couldn't say whether the tradeoff involved would be worthwhile.

Laura Hamilton, COE, said the Chief Joseph tailrace gage, which was enclosed in a pipe for a June 11 spill test, has been giving readings that are 3-5% too low and can't be repositioned until flows drop. These unreliable tailrace readings have shifted the focus to TDG levels in Wells forebay downstream as a

means of assessing gas levels accurately on the mid Columbia. Hamilton noted that Chief Joseph has been experiencing wide swings in spill ranging from 80-160 kcfs, while all other federal dams are consistently spilling at capacity.

Dave Statler, **Nez Perce**, questioned the urgency of this change in spill priorities, and Margaret Filardo, **FPC**, questioned any addition of spill to the mid Columbia when TDG levels are already 124% in Wells forebay. Lorz said TDG levels on the Snake River appear to be less of a problem than debris, therefore spill on the Snake would be preferable to anywhere else. Kruger said Oregon supports this view.

Russ Kiefer, **Idaho**, suggested moving McNary down on the spill priority list because it now has the highest TDG levels of all federal projects where fish pass. Without more information, Idaho couldn't support this proposal.

Given the general consensus that more data are needed before TMT members can evaluate the proposed change in spill priorities, and the urgency to implement a change for the sake of water quality and environmental redispach, the COE and BPA will collaborate on a fast track and attempt to provide written information to TMT by noon tomorrow in preparation for a conference call Friday. The data will be emailed to TMT members and posted to the TMT webpage. Information on the effects of the proposed change will cover:

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3. Next TMT Meeting

There will be a conference call at 11 am Friday, June 24, to follow up on this conversation. The next regular TMT meeting is June 29.

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David Wills	USFWS
Lisa Wright	COE
John Roache	BOR
Tony Norris	BPA

Tom Lorz	CRITFC/Umatilla
Stu Leavitt	Kootenai
Shane Scott	PPC
Dave Benner	FPC
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Margaret Filardo	FPC
Russ George	WMC
Laura Hamilton	COE
Scott English	COE
Dan Feil	COE
Steve Hall	COE Walla Walla
Barry Espenson	CBB
Ruth Burris	PGE
Rob Allermann	Deutsch Bank
Dave Statler	Nez Perce
Mike Shapley	Snohomish PUD
Doug Vine	Thompson Reuters
Bill Rudolph	NW Fish Letter
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COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 22, 2011

Conference call

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Rick Kruger, **Oregon**, agreed with Lorz's concerns and said more information is needed before he can explain this proposal to decision-makers at his agency. Lorz asked whether the COE has modeled the potential effects of this proposal. Without knowing the percentage by which TDG conditions would improve, Lorz couldn't say whether the tradeoff involved would be worthwhile.

Laura Hamilton, COE, said the Chief Joseph tailrace gage, which was enclosed in a pipe for a June 11 spill test, has been giving readings that are 3-5% too low and can't be repositioned until flows drop. These unreliable tailrace readings have shifted the focus to TDG levels in Wells forebay downstream as a

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Russ Kiefer, **Idaho**, suggested moving McNary down on the spill priority list because it now has the highest TDG levels of all federal projects where fish pass. Tony Norris stated that this would not likely change the level of TDG at MCN because the project is turbine limited. Without more information, Idaho couldn't support the proposal to move CHJ on the spill priority list.

Given the general feedback that more information is needed before TMT members can evaluate the proposed change in spill priorities, and the urgency to implement a change for the sake of water quality and environmental redispach, the COE and BPA will collaborate on a fast track and attempt to provide written information to TMT by noon tomorrow in preparation for a conference call Friday. The data will be emailed to TMT members and posted to the TMT webpage. Information on the effects of the proposed change will cover:

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Dave Statler	Nez Perce
Mike Shapley	Snohomish PUD
Doug Vine	Thompson Reutters
Bill Rudolph	NW Fish Letter
Jim Litchfield	Montana

PROPOSED SPILL PRIORITY LIST

JUNE 22, 2011 (2-3 WEEK DURATION)

LEVEL 1 SPILL IS AS FOLLOWS:

* CHANGED

- 1) CHJ TO 120% TDG SPILL CAP*
- 2) LMN TO 120% TDG SPILL CAP*
- 3) LGS TO 120% TDG SPILL CAP*
- 4) MCN TO 120% TDG SPILL CAP*
- 5) IHR TO 120% TDG SPILL CAP*
- 6) LWG TO 120% TDG SPILL CAP*
- 7) TDA TO 120% TDG SPILL CAP*
- 8) JDA TO 120% TDG SPILL CAP*
- 9) BON TO 120% TDG SPILL CAP*
- 10) DWR TO 110% TDG SPILL CAP*
- 11) GCL TO 110% TDG SPILL CAP*

LEVEL 2 SPILL IS AS FOLLOWS:

- 12) LMN TO 122% TDG SPILL CAP
- 13) LGS TO 122% TDG SPILL CAP
- 14) MCN TO 122% TDG SPILL CAP
- 15) IHR TO 122% TDG SPILL CAP
- 16) LWG TO 122% TDG SPILL CAP
- 17) TDA TO 122% TDG SPILL CAP
- 18) JDA TO 122% TDG SPILL CAP
- 19) BON TO 122% TDG SPILL CAP
- 20) CHJ TO 122% TDG SPILL CAP
- 21) GCL TO 115% TDG SPILL CAP

LEVEL 3 SPILL IS AS FOLLOWS:

- 22) LMN TO 125% TDG SPILL CAP
- 23) LGS TO 125% TDG SPILL CAP
- 24) MCN TO 125% TDG SPILL CAP
- 25) IHR TO 125% TDG SPILL CAP
- 26) LWG TO 125% TDG SPILL CAP
- 27) TDA TO 125% TDG SPILL CAP
- 28) JDA TO 125% TDG SPILL CAP
- 29) BON TO 125% TDG SPILL CAP
- 30) CHJ TO 125% TDG SPILL CAP
- 31) GCL TO 120% TDG SPILL CAP

LEVEL 4 SPILL IS AS FOLLOWS:

- 32) LMN TO 127% TDG SPILL CAP
- 33) LGS TO 127% TDG SPILL CAP
- 34) MCN TO 127% TDG SPILL CAP
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- 39) BON TO 127% TDG SPILL CAP
- 40) CHJ TO 127% TDG SPILL CAP
- 41) GCL TO 122% TDG SPILL CAP

LEVEL 5 SPILL IS AS FOLLOWS:

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TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT CONFERENCE CALL

Wednesday June 29, 2011 9:00am - 12:00pm

CONFERENCE CALL INFORMATION

Phone Number (877) 336-1274

Access Code 3871669

Security Code 6845

**We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone**

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Spill Priority List Update - Doug Baus, COE-NWD
 - a. [Spill Priority List](#)
 - a. [Supplemental Information Regarding the Spill Priority List with TDG Production Data](#)
3. Other
 - a. Set agenda and date for next meeting - **June 29, 2011**
 - b. [\[Calendar 2011\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 24, 2011 Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the "record" of the meeting, only a reminder for TMT members.

Spill Priority List

As follow up from the 6/22 TMT conference call, TMT members reconvened to discuss the COE's proposed change to the Spill Priority List, to move Chief Joseph to the top of the list in the Level 1 tier of involuntary spill.

Doug Baus, COE, reported that the new proposed list had been posted to the TMT web page just prior to today's call and was intended to describe more clearly the proposed operation. He acknowledged additional data that had been requested was not provided or available at this time. He said the purpose for today's call was to articulate the change and how it will be used:

- o Continue voluntary spill in accordance with the Summer Fish Operations Plan at all fish passage projects.
- o For involuntary spill conditions, and to best manage, TDG, Level 1 spill would spill at all fish passage projects to attain 120% tailwater/115% downstream forebay spill caps if not already spilling to those TDG levels.
- o Level 2 spill, when all other projects have spilled up to their caps, Chief Joseph would spill to 120% as measured the spillway tailrace.
- o This shift will reduce the wind energy re-dispatch, which BPA is managing per its current Environmental Re-Dispatch policy.
- o It is anticipated that lack of load conditions will persist in to mid-July, and this would be the anticipated timeframe for managing involuntary spill to the priority list described in the COE document provided today.

Clarifying questions:

- o TDG reports on the TMT website show Chief Joseph is the only project in the system that is within the state water quality standards. What level/stage of involuntary spill are we at currently? BPA response: Chief Joseph is the only project with any flexibility to reduce generation and remain within TDG standards. And, we still anticipate low load conditions and flows to recede on the Snake River over the next three weeks.
- o The river appears to gain gas between the Chief Joseph tailwater and Wells forebay gauges. How will the COE manage for spill? COE response: Actual spill TDG is accurate at Chief Joseph, then mixed downstream showing higher TDG when mixed with water out of the powerhouse. Grand Coulee will begin operating to drum gate spill so TDG levels should drop downstream, and should be maintained at those lower levels.

- o Is there still a concern with Chief Joseph readings being too low? COE response: While there was some discussion at TMT on Wednesday about this issue, the COE's current official position is to use the Chief Joseph gauge and manage to 120% in the Chief Joseph tailwater. Again, with Grand Coulee spill soon to be coming over the drum gates, significant lowering of TDG will be seen downstream. Still, gas will remain high, and degassing will be provided by Chief Joseph spill.
- o NOAA: During high flow levels, adult fish fallback becomes a concern, and more spill at Chief Joseph could be a potential benefit – but there is not yet good data to support this.
- o What is the trigger for moving to Level 2 involuntary spill? COE response: When projects have spilled up to their water quality criteria (120% tailwater/115% downstream forebay).

Process issues:

TMT members raised concerns that the data they requested to inform technical deliberation over this issue was not available during today's call. That left members feeling unable to further their discussions, and one member suggested moving the discussion to next Wednesday's (6/29) TMT meeting at which time the data could be reviewed and discussed, and the COE would be more informed about its decision. In addition, they asked for clarity on the COE's rationale for its decision.

Data to be shared:

Doug will post actual TDG values associated with various spill levels to the TMT page. The Fish Passage Center shared information with FPAC on Chief Joseph spill and TDG effects on the Wells forebay gauge, and will email those graphs to Doug Baus.

Next Steps/Actions:

- o TMT members are asked to submit written comments to the COE by 3:00 pm today – and to include TMT members in the email so everyone can track the comments.
- o The COE will notify TMT of its decision by the end of today – and provide an update at the 6/29 TMT meeting.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 24, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of Oregon, Montana, Washington, the Nez Perce Tribe, CRITFC/Umatilla Tribe, USFWS, BOR, BPA, COE, NOAA and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Spill Priority List Update

The purpose of today's TMT call was to follow up on concerns voiced by TMT members on the June 22 call, when the COE proposed to move Chief Joseph Dam up on the spill priority list. The June 22 discussion of Level 1 spill led to lack of clarity on how the COE manages in accordance with state TDG standards, Baus explained. To clarify the COE's intention, the proposed spill priority list is linked to today's agenda.

On June 22, TMT members requested more information on potential changes in spill volumes and TDG levels as a result of the change in spill priorities, plus data from a recent spill test at Chief Joseph. Information on the proposed modification to spill priority list was posted to the agenda. The COE is proposing to implement this spill priority list prior to this weekend and is soliciting comments from TMT members to inform the final decision.

Under the proposal, Chief Joseph moves to the top of the Level 2 list, which is for involuntary spill. The COE would continue to spill in accordance with: 1) the 2011 FOP, and 2) 120%/115% fish passage spill caps consistent with the Washington waiver as identified in Level 1. Tony Norris, BPA, clarified that concerns about the gap between BiOp and FOP minimum spills and the Washington standard would be fulfilled prior to spilling Chief Joseph up to 120% TDG.

Baus invited TMT members to send the COE written comments by 3 pm today, which the COE will take into account before making a decision.

Questions and discussion: Jim Litchfield, Montana, wondered whether we're already at Level 3 spill, as Chief Joseph is the only project with additional spill capability. That's correct, Norris said, Snake River projects are out of turbine capacity. Rich Dominigue, NOAA, asked whether the COE would make a decision to spill based on the tailrace gage at Chief Joseph or the forebay gage

at Wells. The Chief Joseph spillway is stripping much of the gas out of incoming flows from Grand Coulee. Tonight when the COE switches the Grand Coulee operation to drumgate spill, TDG levels coming into the Chief Joseph forebay should drop by approximately 13%. John Roache, BOR, asked whether the Chief Joseph tailrace gage measures mixed flows from the spillway and powerhouse. Scott English, COE, said it does not.

Ross Hendricks, Grant PUD, asked whether the Chief Joseph tailrace gage is still giving low readings. Does the project have a waiver from the state of Washington requiring it to be compliant with the 115% standard at the next downstream forebay? Despite recent discussions regarding the accuracy of the CHJ tailrace gauge the COE still uses the CHJ tailrace gauge. Dominique asked whether tailrace or forebay readings would serve as the indicator to move to a higher level of spill on the proposed list. In the Level 1 category, an exceedance at either the forebay or tailrace could be the trigger at any given project, English replied.

Margaret Filardo, FPC, said she will send the COE graphs showing how TDG levels in the Wells forebay responded to increased spill at Chief Joseph. To create the graphs, FPAC members used all Chief Joseph data available this year to correlate spill volumes and proportions at Chief Joseph with TDG levels in the Wells forebay. The expectation was that higher spill levels at Chief Joseph would equal lower TDG levels in Wells forebay, but the data showed the opposite. As spill increased at Chief Joseph, TDG levels at Wells forebay also increased.

Comments: Several Salmon Managers expressed dismay that more information was not provided today on effects of the proposal, as requested during the June 22 TMT call. To help people prepare comments for the COE by 3 pm today, Baus said he would post current TDG production curves to the TMT web page after this call ends.

Given the lack of resolution, there was no official poll of TMT members today. TMT members made the following comments:

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Shane Scott	PPC
Richelle Beck	DRA
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COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

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Proposal for Spill and TDG Management

2011 FOP Spill: Continue spill in accordance with the 2011 Spring and 2011 Summer FOPs at all fish passage projects: LWG, LGS, LMN, IHR, MCN, JDA, TDA, & BON.

Proposed Priority List for Involuntary Spill Conditions (to best manage TDG)¹

LEVEL 1 SPILL (120%/115% TDG SPILL CAP²) IS AS FOLLOWS:

- 1) LMN UP TO 28 kcfs
- 2) LGS UP TO 40 kcfs
- 3) MCN UP TO 190 kcfs
- 4) IHR UP TO 79 kcfs
- 5) LWG UP TO 41 kcfs
- 6) TDA UP TO 135 kcfs
- 7) JDA UP TO 135 kcfs
- 8) BON³ UP TO 121 kcfs

LEVEL 2 SPILL (120% TDG SPILL CAP) IS AS FOLLOWS:

- 1) CHJ UP TO 189 kcfs
- 2) LMN UP TO 40 kcfs
- 3) LGS UP TO 52 kcfs
- 4) MCN UP TO 190 kcfs
- 5) IHR UP TO 75 kcfs
- 6) LWG UP TO 50 kcfs
- 7) TDA UP TO 178 kcfs
- 8) JDA UP TO 144 kcfs
- 9) BON UP TO 107 kcfs
- 10) DWR UP TO 37%
- 11) GCL UP TO -- (110% TDG SPILL CAP)

LEVEL 3 SPILL (122% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 55 kcfs
- 2) LGS UP TO 59 kcfs
- 3) MCN UP TO 235 kcfs
- 4) IHR UP TO 85 kcfs
- 5) LWG UP TO 61 kcfs
- 6) TDA UP TO 210 kcfs
- 7) JDA UP TO 177 kcfs
- 8) BON UP TO 120 kcfs
- 9) CHJ UP TO 200 kcfs
- 10) GCL UP TO 15 kcfs (115% TDG SPILL CAP)

¹ TDG spill cap levels are reviewed daily and are subject to change

² As measured in the tailwater and forebay of the next project downstream respectively

³ Bonneville Dam TDG levels will be managed to 120% in the tailrace – the Cascades Island gauge is out of service and the Corps will continue to use the analog from the Warrendale gauge

LEVEL 4 SPILL (125% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 75 kcfs
- 2) LGS UP TO 70 kcfs
- 3) MCN UP TO 250 kcfs
- 4) IHR UP TO 110 kcfs
- 5) LWG UP TO 70 kcfs
- 6) TDA UP TO 269 kcfs
- 7) JDA UP TO 190 kcfs
- 8) BON UP TO 215 kcfs
- 9) CHJ UP TO 210 kcfs
- 10) GCL UP TO 18 kcfs (120% TDG SPILL CAP)

LEVEL 5 SPILL (127% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 120 kcfs
- 2) LGS UP TO 95 kcfs
- 3) MCN UP TO 280 kcfs
- 4) IHR UP TO 124 kcfs
- 5) LWG UP TO 85 kcfs
- 6) TDA UP TO 294 kcfs
- 7) JDA UP TO 206 kcfs
- 8) BON UP TO 234 kcfs
- 9) CHJ UP TO 250 kcfs
- 10) GCL UP TO 21 kcfs (122% TDG SPILL CAP)

LEVEL 6 SPILL (130% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 180 kcfs
- 2) LGS UP TO 125 kcfs
- 3) MCN UP TO 321 kcfs
- 4) IHR UP TO 145 kcfs
- 5) LWG UP TO 98 kcfs
- 6) TDA UP TO 360 kcfs
- 7) JDA UP TO 250 kcfs
- 8) BON UP TO 250 kcfs
- 9) CHJ UP TO 275 kcfs
- 10) GCL UP TO 75 kcfs (125% TDG SPILL CAP)

LEVEL 7 SPILL (135% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 250 kcfs
- 2) LGS UP TO 177 kcfs
- 3) MCN UP TO 375 kcfs
- 4) IHR UP TO 240 kcfs
- 5) LWG UP TO 200 kcfs
- 6) TDA UP TO 400 kcfs
- 7) JDA UP TO 300 kcfs
- 8) BON UP TO 260 kcfs
- 9) CHJ UP TO 300 kcfs
- 10) GCL UP TO 120 kcfs (130% TDG SPILL CAP)

Proposal for Spill and TDG Management

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Proposed Priority List for Involuntary Spill Conditions (to best manage TDG)

LEVEL 1 SPILL AS FOLLOWS: Spill at fish passage projects (LWG, LGS, LMN, IHR, MCN, JDA, TDA, & BON¹) will be evenly distributed to attain 120%/115%² fish passage spill caps (if not currently spilling to these TDG levels):

LEVEL 2 SPILL IS AS FOLLOWS:

- 1) CHJ TO 120% TDG SPILL CAP
- 2) LMN TO 120% TDG SPILL CAP
- 3) LGS TO 120% TDG SPILL CAP
- 4) MCN TO 120% TDG SPILL CAP
- 5) IHR TO 120% TDG SPILL CAP
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- 8) JDA TO 120% TDG SPILL CAP
- 9) BON TO 120% TDG SPILL CAP
- 10) DWR TO 110% TDG SPILL CAP
- 11) GCL TO 110% TDG SPILL CAP

LEVEL 3 SPILL IS AS FOLLOWS:

- 12) LMN TO 122% TDG SPILL CAP
- 13) LGS TO 122% TDG SPILL CAP
- 14) MCN TO 122% TDG SPILL CAP
- 15) IHR TO 122% TDG SPILL CAP
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- 20) CHJ TO 122% TDG SPILL CAP
- 21) GCL TO 115% TDG SPILL CAP

LEVEL 4 SPILL IS AS FOLLOWS:

- 22) LMN TO 125% TDG SPILL CAP
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- 24) MCN TO 125% TDG SPILL CAP
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- 26) LWG TO 125% TDG SPILL CAP
- 27) TDA TO 125% TDG SPILL CAP

¹ Bonneville Dam TDG levels will be managed to 120% at the tailrace -- the Cascade Island gauge is out of service, and the Corps will continue to use the analog from the Warrendale gauge.

² As measured in the tailwater & forebay of next project downstream respectively

- 28) JDA TO 125% TDG SPILL CAP
- 29) BON TO 125% TDG SPILL CAP
- 30) CHJ TO 125% TDG SPILL CAP
- 31) GCL TO 120% TDG SPILL CAP

LEVEL 5 SPILL IS AS FOLLOWS:

- 32) LMN TO 127% TDG SPILL CAP
- 33) LGS TO 127% TDG SPILL CAP
- 34) MCN TO 127% TDG SPILL CAP
- 35) IHR TO 127% TDG SPILL CAP
- 36) LWG TO 127% TDG SPILL CAP
- 37) TDA TO 127% TDG SPILL CAP
- 38) JDA TO 127% TDG SPILL CAP
- 39) BON TO 127% TDG SPILL CAP
- 40) CHJ TO 127% TDG SPILL CAP
- 41) GCL TO 122% TDG SPILL CAP

LEVEL 6 SPILL IS AS FOLLOWS:

- 42) LMN TO 130% TDG SPILL CAP
- 43) LGS TO 130% TDG SPILL CAP
- 44) MCN TO 130% TDG SPILL CAP
- 45) IHR TO 130% TDG SPILL CAP
- 46) LWG TO 130% TDG SPILL CAP
- 47) TDA TO 130% TDG SPILL CAP
- 48) JDA TO 130% TDG SPILL CAP
- 49) BON TO 130% TDG SPILL CAP
- 50) CHJ TO 130% TDG SPILL CAP
- 51) GCL TO 125% TDG SPILL CAP

LEVEL 7 SPILL IS AS FOLLOWS:

- 52) LMN TO 135% TDG SPILL CAP
- 53) LGS TO 135% TDG SPILL CAP
- 54) MCN TO 135% TDG SPILL CAP
- 55) IHR TO 135% TDG SPILL CAP
- 56) LWG TO 135% TDG SPILL CAP
- 57) TDA TO 135% TDG SPILL CAP
- 58) JDA TO 135% TDG SPILL CAP
- 59) BON TO 135% TDG SPILL CAP
- 65) CHJ TO 135% TDG SPILL CAP
- 61) GCL TO 130% TDG SPILL CAP

Supplemental Information Concerning the Proposed Modification to the Spill Priority List -- Moving the Position of Chief Joseph Dam

The following questions and responses below were based on: A) Questions the Corps received during the June 17 TMT meeting; and, B) an email inquiry sent on June 24.

1. What could be the potential results in Chief Joseph Dam (CHJ) spill volume and Total Dissolved Gas (TDG) levels that could result from CHJ to the top of the spill priority list?

The spill volume will be a function of insufficient load to support generation. Moving CHJ to first position in Level 2 (120% TDG spill cap) of the proposed spill priority list will result in periodic increases in spill at CHJ (lasting 2-6 hours on some days). Spill at CHJ up to 120% TDG measured in the tailrace will occur before initiating involuntary spill to 120% measured in the tailrace of the fish passage projects.

The potential range of additional spill at CHJ associated with modifying the spill priority list is between 0 and 100 kcfs with current spill caps. That range will change with flow requirements associated with Grand Coulee refill, flood control management and TDG production estimates.

On June 24th, GCL transitioned to drumgate spill resulting in additional TDG reductions of approximately 10% in the CHJ forebay. The Corps will continue monitoring TDG levels and adjust the spill levels based on TDG production estimates both at the CHJ and Wells forebay.

2. What could be the potential impacts to spill and TDG that would occur at other projects (in the context of total river flow)?

The lower Columbia and lower Snake River projects will continue to spill flow in excess of turbine capacity as long as such conditions continue to exist. Please refer to the supplemental modified spill priority for projected project flows at:

http://www.nwd-wc.usace.army.mil/tmt/agendas/2011/0624_Agenda.html

As flows recede and there are periods of insufficient demand to support generation, spill on the the lower Columbia and lower Snake River projects will be prioritized for spill up to the 120%/115% waiver levels.

This will reduce or the likelihood that spill on the lower Snake River will exceed the WA TDG standards at the fish passage projects¹. Independent of flow conditions, spill levels would be no lower than the FOP spill at the fish passage projects.

3. What type of impacts did the June 5 spill test at CHJ have on Wells Dam forebay?

The June 5 spill test varied spill between 80 and 190 kcfs for 8 hours. This short duration spill test resulted in no observable effect on the Wells forebay TDG levels.

4. What type of impacts could this operation have on environmental re-dispatch?

¹ Recommend NOAA address whether this may reduce instances of adult fallback at the fish passage projects.

Absent the proposed modification to the spill priority list, as flows recede, spill levels at the lower Snake and lower Columbia fish passage projects would be at levels exceeding those provided for in the state waivers. This would necessitate implementation of environmental redispach at lower levels of spill, increasing the likelihood of environmental redispach by the MW equivalent of the spill potential at CHJ. Up to 1300 MWs of additional environmental redispach in any given hour relative to recent implementation could occur.

5. What was the location of the tailwater probe relative to the June 5 spill test?

From May through June 11 at 0900 hours the tailwater probe was located outside of the pipe. On June 11 the tailwater probe was moved into the pipe and is currently located inside of the pipe. Specific data for the June 5 spill test may be found on the following website:

<http://www.nwd-wc.usace.army.mil/tmt/wq/historical/>

6. Have all measures including, Non-treaty storage agreements and increasing pumping into Banks Lake been reviewed and utilized to reduce gas levels in the CHJ and Wells Dam forebay?

All measures have been utilized to reduce gas levels in CHJ and the Wells Dam forebay. Mica Reservoir in Canada is operating at minimal discharge of about 500 kcfs. Banks Lake is currently filling at approximately 8 – 10 kcfs/day

7. If CHJ was moved to the top of the spill priority list how would the Corps and BPA manage lack of load spill with respect to the following: 1) the 2011 Fish Operations Plan, 2) Washington waiver criteria of 120%/115%, and 3) managing to 120% tailrace.

Management of TDG during high flow conditions and insufficient load to support generation will continue to implement the spill priority list as described in the 2011 FOP (pages 2-3). Spill would be managed to the 120%/115% fish passage spill caps (Level 1), then to 120% tailrace (Level 2), etc. The only modification proposed is to move CHJ to the first position in Level 2.

TECHNICAL MANAGEMENT TEAM

BOR: John Roache / Mary Mellema / Pat McGrane	BPA: Tony Norris / Scott Bettin / Robyn MacKay
NOAA-F: Paul Wagner / Richard Dominique	USFWS: David Wills / Steve Haeseker
OR: Rick Kruger / Ron Boyce	ID: Russ Kiefer / Pete Hassemer
WDFW: Cindy LeFleur / Charles Morrill	MT: Jim Litchfield / Brian Marotz
Kootenai: Sue Ireland / Billy Barquin	Spokane: Deanne Pavlik-Kunkel / Andy Miller
Colville: Sheri Sears / Steve Smith	Nez Perce: Dave Statler
Umatilla: Tom Lorz (CRITFC)	
COE: Steve Barton / Karl Kanbergs / Doug Baus	

TMT MEETING

Wednesday June 29, 2011 9:00am - 12:00pm

1125 N.W. Couch Street, Suite 500, Columbia Room
Portland, Oregon 97209-4142
Map Quest [\[Directions\]](#)

TMT MEETING
Phone Number (877) 336-1274
Access Code 3871669
Security Code 6845

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
Please MUTE your Phone

*All members are encouraged to call Robin Gumpert with any issues or concerns they would like to see addressed.
Please e-mail her at rgumpert@cnmw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review May June 22 and 24 Meeting Minutes [\[Meeting Minutes\]](#)
3. Libby Operations Update - Doug Baus, COE-NWD; Joel Fenolio, COE-NWS
4. Spill Priority List Update - Doug Baus, COE-NWD
 - a. [Supplemental Information Regarding the Spill Priority List with TDG Production Data](#)
 - a. [Response to Questions](#)
5. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Water Quality
 - d. Power System
6. Other
 - a. Set agenda and date for next meeting - **June 8, 2011**
 - b. [\[Calendar 2011\]](#)

Questions about the meeting may be referred to:

[Steve Barton](#) at (503) 808-3945, or

[Dong Baus](#) at (503) 808-3995

COLUMBIA RIVER TECHNICAL MANAGEMENT TEAM

June 29, 2011

FACILITATOR'S SUMMARY NOTES

Facilitator: Robin Gumpert

The following notes are a summary of issues that are intended to point out future actions or issues that may need further discussion at upcoming meetings. These notes are not intended to be the “record” of the meeting, only a reminder for TMT members.

Libby Operations

Joel Fenolio, Seattle District COE, provided an update on the sturgeon operation at Libby, reporting that there was about 258 kaf remaining of the full 1.2 MAF operation. The project would continue to operate 15 kcfs outflows through July 2, then ramp down to 13 kcfs and finally to a flat flow (expected to be 9-12 kcfs starting between 7/12 and 7/15). Refill was expected to top out around 2448-2452' in early to mid-August. Data on sturgeon movement will be shared later in August. TMT will check in on this operation in two weeks.

Spill Priority List

Doug Baus, COE, reported that he followed up the 6/24 TMT conference call on this issue with an email indicating that the COE would not implement the proposed change to move Chief Joseph to the top of Level 2 on the spill priority list that had been discussed at the 6/22 and 6/24 meetings. However, until this proposed change could be coordinated with TMT Chief Joseph would be operated to its 115/120% spill cap before any other projects would exceed their 115/120% spill caps. This would allow the Corps to manage TDG systemwide for involuntary spill situations consistent with levels described in the State TDG waivers.

In response to requests for information, the COE provided supplemental information and answers to questions in the form of two documents linked to today's agenda. This information was provided in advance of today's meeting so TMT members had an opportunity to review it before the discussion.

With that, Doug said the COE's proposed operation moving forward was to implement the spill priority list proposed over the last two meetings, and wanted to hear feedback from the region now that more information was in hand to inform the discussion.

The following bullets summarize the questions and clarifications discussed during today's call:

- Adding Chief Joseph to the bottom of the Level 1 list (it previously was not on the list) was very helpful in clarifying the intended progression through the list.
- Currently, all of the projects exceeding their water quality standards requirements were spilling due to lack of turbine capacity. Spill at projects not limited by turbine capacity is guided by the spill priority lists.

- Some salmon managers suggested that spill above the 115/120% standard should be spilled at Lower Monumental and Little Goose to provide the best biological conditions for juvenile passage.
- That said, concerns with adult fall back conditions in the Snake were a main driver for the COE's proposal to spill Chief Joseph up to the 120% tailrace standard before spilling Little Goose or Lower Monumental to the 120% in the tailrace, so as not to compound the adult fall back concern. (Questions were raised about whether or not adult fallback was a concern under the current conditions and that more data needed to be gathered on this issue.)
- This unique water year calls for a close look at impacts – from a water quality, biological and operations perspective. TMT agreed to follow up later in the season with more in-depth discussion of how the spill priority list is/was used, adult fall back impacts, and other issues associated with the current conditions in the system.
- The COE clarified that its justification for the proposed list was to manage TDG in the system and to lessen the impact on adult fall back issues in the Snake River.

Process/Next Steps: Doug Baus requested that TMT members express their level of support for use of the proposed spill priority list as a temporary (2-3 week) guide to manage lack of load in the system:

- Montana – It is always difficult to strike a balance of all needs, and this proposal considers adult passage and water quality standards. With the clear information provided today, this proposal makes sense – so we support it.
- Idaho – Appreciate the efforts of the action agencies to inform us and engage us in technical deliberation on this issue. We are very concerned with adult fall back but have not seen any technical information indicating significant fallback when flows and spill are in the range being discussed with this proposal. We don't want to see a TDG exceedance to state water quality standards, but do see a slight detriment to juvenile passage with this change, so we do not support the shift – and will not raise an objection.
- Oregon – Supports meeting water quality standards but does not agree with the use of the forebay gauge to manage TDG. Also agrees with the concerns raised by Idaho and so does not support the proposal, but will not raise an objection.
- USFWS – From a fisheries perspective, we do not support the operation but will not raise an objection.
- NOAA – This is a reasonable proposal that strikes a balance between meeting water quality standards and fish passage conditions. The process for deliberation on the spill priority list is always a challenge, and we should look closely post-season at the adult fall back data to discuss the impacts and consider future operations.
- Nez Perce Tribe – Agree with the comments from Idaho, Oregon and USFWS, and, still have questions about how this spill priority list will actually be implemented. More information on the adult fall back issue is needed in order to make an informed response to this new issue that has come up in discussions around the spill priority list. Given all this, do not support the shift. Nez Perce did not elevate the issue.

- CTUIR – Support Nez Perce concerns.
- Reclamation – No objections to the proposal.
- BPA – Support the proposal.

ACTION: The COE will consider the information and discussions from today and determine how to proceed. Doug Baus will email TMT with the final decision.

Operations Review

Reservoirs – Greg Bowers, COE, reported that Libby was at elevation 2421.78', and Bonners Ferry was below flood stage. Albeni Falls remained above flood stage at 2063.53'. Priest Rapids flows were 248 kcfs. Dworshak was at elevation 1592.06' and filling, with 18.5 kcfs inflows. A snow flight showed the snow covered area was 11%, so this was no longer a governing factor for Dworshak refill. McNary flows were 462 kcfs. Mary Mellema, Reclamation, reported that Hungry Horse was at elevation 3539.5' and filling, with 8 kcfs outflows. Grand Coulee was at elevation 1276.7' and will fill after the July 4th weekend. Doug Baus, COE, reported that Ice Harbor spill treatments over this weekend and next weekend would be altered to manage high inflows. This operation is identified in the 2011 Summer FOP and has been implemented in previous years.

Fish – Paul Wagner, NOAA, reported on adult passage. Summer Chinook was similar to the 10-year average as well as last year's counts. Jacks were much higher than the 10-year average and last year, and sockeye were close to the 10-year average at this point. Russ Kiefer, Idaho, reported that the Snake River sockeye return was looking good again this year, with a total of 95 PIT-tagged adults counted at Bonneville so far, with 29 of those detected yesterday the 28th. Paul reported on juveniles – the yearling run was complete. Subyearlings were showing up around 10,000-20,000 per day at Lower Granite; 120,000 at McNary (including Hanford Reach releases); and 50,000 at Bonneville (also including hatchery releases). Lamprey numbers remained low, with about 1,100 passing McNary and 1,000 passing John Day.

Water quality – Scott English, COE, gave the latest TDG report, and noted that the use of Grand Coulee drum gate for spill which began Friday was showing a positive impact downstream in terms of TDG abatement. Chief Joseph spill was helping to de-gas the river too, and the Warrendale gauge analog was still being used in place of the Bonneville tailwater gauge which is still off line. Scott acknowledged the work of the Seattle District and ERDC for assisting in producing data to inform water quality management decisions at Chief Joseph.

Power system – Nothing to report.

Next Meeting, 7/6 (Conference Call): 11:00 AM (NOTE THE NEW TIME!!)

TMT will discuss Dworshak operations. Participants were encouraged to check the TMT web page for schedule and agenda updates.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 29, 2011

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus, COE, and facilitated by Robin Gumpert, DS Consulting. Representatives of BPA, Montana, Oregon NOAA, COE, USFWS, BOR, CRITFC/Umatilla, Idaho, Nez Perce Tribe and others attended. This summary is an official record of the proceedings, not a verbatim transcript. Any questions or comments should be directed to the TMT chair.

2. Review Meeting Minutes for June 22 and 24

There were no comments today on the official minutes or facilitators' notes so both sets are considered final.

3. Libby Operations

Since June 2 the COE has been counting Libby releases against the 1.2 maf sturgeon volume for 2011, Joel Fenolio, COE, reported. At present, 258 kaf of sturgeon volume accounting remains. Libby has been releasing 15 kcfs and that operation will continue through July 2. On June 17, the project ramped down to full powerhouse on the descending limb of the sturgeon pulse, holding 20 kcfs flows for 5 days and 17 kcfs for another 5 days. The project will continue to release 15 kcfs for another 5 days, then ramp down to 13 kcfs on July 2 until approximately July 12. At that point the operation will ramp down to 10.5-11 kcfs. Refill is anticipated from early to mid August when the project reaches elevation 2,448-2452 feet. There is no precipitation in the area at present. Fenolio estimated that the Libby April-August inflow volume will end up being around 7.5-7.6 maf.

Jim Litchfield, Montana, asked about sturgeon behavior this year. Researchers are still processing the data, Fenolio replied. Bonners Ferry stage reached 1,763 feet and held that elevation for about 6 days so the operation is generally going well. There will be an update on this in 2 weeks.

4. Spill Priority List Update

Baus updated TMT on what has occurred since the June 24 conference call regarding the proposed operation to modify the spill priority list. In response to questions from the region about the effects the proposal would have on spill and TDG levels, the COE has posted information to today's agenda. The attached spill priority list shows what the COE proposes to do starting today.

Chief Joseph is at the top of the Level 2 spill list at the 120 TDG spill cap level, just as it was on June 24. In addition, Chief Joseph has been listed under Level 1 spill to clarify the operation presented on June 24. The COE will manage Level 1 spill at Chief Joseph consistent with state water quality waivers. Litchfield and Paul Wagner, NOAA, agreed the Level 1 listing of Chief Joseph provides an important clarification to this operation. Baus then invited TMT members to ask questions and provide comments on the proposed operation to modify the spill priority list.

There was discussion of current conditions at the projects in terms of spill levels on the list. Rick Kruger, Oregon, reported that Little Goose forebay gas levels are around 119% TDG and the Little Goose tailwater is 117%, putting Little Goose in the Level 1 spill category. Chief Joseph spill is 100 kcfs, also Level 1. Gas levels are 120-121% in the Chief Joseph forebay and 115-116% in the tailrace. Scott English, COE, pointed out that at this point spill may be occurring due to lack of hydraulic capacity, not lack of load. Dan Feil, COE, noted that the spill priority list attached to today's agenda only comes into play when there is spill due to lack of demand. Spill due to lack of turbine capacity is limited to that project and can't be spilled elsewhere in the system.

At the 120% TDG spillcap level, Russ Kiefer, Idaho, said he sees biological benefits to spilling at Lower Monumental and Little Goose over Chief Joseph. Feil said the COE views the proposed change as a tool to eliminate problems with adult fallback on the Snake at high levels of spill. The COE has two main reasons for making this proposal: to manage TDG system-wide and to alleviate concerns with adult passage at high levels of spill. Feil emphasized that the proposal is a temporary response over the next 2-3 weeks to current conditions. Kiefer asked for technical data indicating that spill up to 40 kcfs at Lower Monumental in overgeneration mode would cause significant fallback. Fallback was a much bigger problem at uncontrolled spill than it is now. Tony Norris, BPA, replied that flows are exceeding the hydraulic capacity of the Lower Monumental powerhouse, a condition that is expected to continue. As flows drop, overgeneration spill under the proposed operation would follow the order in Level 1 in accordance with the Washington TDG waiver, beginning with Lower Monumental. At current flow volumes, the COE does not foresee that Level 3 spill will be an issue so the focus is on the Level 2 category, Feil said.

Dave Statler, Nez Perce Tribe, said adult fallback on the lower Snake is an issue worthy of consideration and asked whether data backup for that justification is part of the information the COE provided today. That was not an inquiry the COE received so it is not included in today's postings, Baus replied. Kruger said this is a new issue which changes the question.

Richelle Beck, DRA, asked whether moving spill to Chief Joseph would help minimize GBT injuries at Rock Island Dam. Using the drumgates at Grand Coulee has alleviated gas problems substantially – a 13% drop in the first 3 days

after switching to drumgate spill, Kruger replied. Norris agreed and pointed out that TDG levels at the Canadian boundary are 123% and degassing by the time flows reach Grand Coulee. The dissipated spill pattern at Grand Coulee is helping to strip gas out of the system.

David Wills, USFWS, asked what spilling Chief Joseph to 150 kcfs means in the Level 1 spill category. What TDG levels are expected at 150 kcfs and how is that measured? Level 1 spill is to the spill caps for 120% in the tailrace and 115% in the downstream forebay, Baus replied. Wells forebay TDG levels are primarily a function of Grand Coulee discharges. TDG that passes through the Chief Joseph powerhouse is primarily unchanged, thus the Wells forebay TDG levels are higher than those measured at the Chief Joseph tailrace gage.

Kiefer reported that PIT tag data on adult wild spring chinook in the Snake do not show any signs of a conversion problem to Ice Harbor, even with high flows and a turbine out at Little Goose.

There was general acknowledgement that the proposed change in spill priorities does not violate the BiOp or FOP, therefore it is ultimately a COE management decision. There was general consensus that Washington state water quality standards can not be deliberately violated. Recognizing this context, TMT members stated their views:

- **NOAA** – PIT tag information indicates that adult fallback is an issue this year, perhaps because of the RSWs. There have been observations of injured fish hanging around at Lower Monumental, particularly “head burn” injuries which are probably associated with exposure to high TDG levels. Because adults are of primary concern, it’s better to err on the side of caution. This proposal strikes a good balance between state TDG standards and adult passage. Spring chinook adults, the species of greatest concern, have adequate conditions under this proposal. Also, spill for juveniles is already well beyond that called for in the FOP.
- **Idaho** – Is concerned about adult passage but has not seen technical information that indicates adult fallback will be a significant problem in the range of spill volumes under consideration. There is no clear advantage to this operation and it would be slightly to the detriment of juveniles. Fallback was a problem at higher spill levels but that doesn’t necessarily apply to conditions over the next few weeks. Does not support the proposed operation, but does not want to elevate the issue.
- **Oregon** – Favors operating to 120% in the tailrace only, but would not endorse an operation that deliberately violates the Washington state standard. Does not support the proposed change in spill priorities; agrees with Idaho’s position.

- **Montana** – Adults have significantly more biological value than juveniles in terms of the life cycle, so an operation that benefits adult passage makes sense. The proposal is much clearer now than it was initially and Montana supports it.
- **USFWS** – Agrees with Idaho. Does not support the proposal, but doesn't want to elevate it for dispute resolution.
- **Nez Perce** – Agrees with Idaho, Oregon and USFWS. Benefits of this change for adults and juveniles have not been fully analyzed and vetted.
- **CRITFC/Umatilla** – Supports the Nez Perce concerns.
- **BOR** – No objection.
- **BPA** – Supports the change.

The COE will consider these comments and email its decision to TMT members. TMT will revisit this issue on its next conference call July 6.

5. Operations Review

Reservoirs. Libby is at elevation 2,421.78 feet. Flows to Bonners Ferry have been dropping, with a current elevation of 5,803 feet at the gage. Albeni Falls is at elevation 2,063.53 feet, still slightly above flood stage at the Hope gage. The project will remain on free flows for a few more days, maintaining the lake at elevation 2,065 feet or lower. Priest Rapids average flows are 248 kcfs.

Dworshak is at elevation 1,592.06 feet, expected to reach 1,594 feet by the end of June. Inflows are still 18.5 kcfs. McNary average flows are 402 kcfs. Hungry Horse is at elevation 3,539.5 feet, with 8 kcfs out.

Grand Coulee is at elevation 1,276.7 feet and is expected to fill after July 5. There's still 30 maf of snow in the headwaters, Greg Bowers, COE, reported.

Ice Harbor In past years the COE has modified treatment schedules at Ice Harbor to manage high inflows, as specified in the FOP. Over the next 2 weekends the COE intends to modify some treatment schedules consistent with the FOP and previous years' operations, Baus said.

Fish. Adults: Sockeye passage is coming on strong, with 70,000 passing Bonneville to date, Paul Wagner, NOAA, reported. Fall chinook adult passage totals are 75,000 at Lower Granite and 92,000 at Little Goose. Steelhead passage has yet to begin in earnest. Only one sockeye has passed Lower Granite so far, and 38 have passed Ice Harbor. Kiefer added that this year looks like another promising Snake River sockeye return. Yesterday 29 Snake River

sockeye were detected at Bonneville Dam, for a total season count of 95 to date. Feil noted that larger adult counts at Little Goose than at projects downriver indicate that fallback at Goose is a problem.

Water quality. Scott English showed TMT the TDG data for June. High levels of involuntary spill have been causing exceedances in recent weeks. Conversion from RO to drumgate spill at Grand Coulee on June 24 has been a significant benefit. When flows at Bonneville go below 235 kcfs, USGS will be ready to get the tailwater gage back on line. In the meantime, the COE is using the Warrandale gage to evaluate tailwater conditions at Bonneville. Gas coming over the border at the Boundary gage has been stable at 132%, Norris added.

Power. There was nothing to report today.

6. Next Meeting

There will be a conference call at 11 am on July 6 to check in on Dworshak operations and update today's discussion of spill priorities. The next regular TMT meeting will be on July 13.

Name	Affiliation
Tony Norris	BPA
Jim Litchfield	Montana
Doug Baus	COE
Rick Kruger	Oregon
Paul Wagner	NOAA
Greg Bowers	COE
Dan Feil	COE
Scott English	COE
Phone:	
David Wills	USFWS
Mary Mellema	BOR
Scott Bettin	BPA
Kyle Dittmer	CRITFC
Russ Kiefer	Idaho
Joel Fenolio	COE Seattle
Bill Rudolph	NW Fish Letter
Margaret Filardo	FPC
Tim Heizenrader	Centaurus
Ruth Burris	PGE
Russ George	WMC
Bruce McKay	consultant
Barry Espenson	CBB
Rob Allerman	Deutsch Bank
XX	Puget Sound Energy

XX
Dave Statler
Glen Trager
Steve Hall
Laura Hamilton
Richelle Beck

Snohomish PUD
NPT
Iberdrola Renewables
COE Walla Walla
COE
DRA

Proposal for Spill and TDG Management

2011 FOP Spill: Continue spill in accordance with the 2011 Spring and 2011 Summer FOPs at all fish passage projects: LWG, LGS, LMN, IHR, MCN, JDA, TDA, & BON.

Proposed Priority List for Involuntary Spill Conditions (to best manage TDG)¹

LEVEL 1 SPILL (120%/115% TDG SPILL CAP²) IS AS FOLLOWS:

- 1) LMN UP TO 28 kcfs
- 2) LGS UP TO 40 kcfs
- 3) MCN UP TO 190 kcfs
- 4) IHR UP TO 79 kcfs
- 5) LWG UP TO 41 kcfs
- 6) TDA UP TO 135 kcfs
- 7) JDA UP TO 135 kcfs
- 8) BON³ UP TO 121 kcfs

LEVEL 2 SPILL (120% TDG SPILL CAP) IS AS FOLLOWS:

- 1) CHJ UP TO 189 kcfs
- 2) LMN UP TO 40 kcfs
- 3) LGS UP TO 52 kcfs
- 4) MCN UP TO 190 kcfs
- 5) IHR UP TO 75 kcfs
- 6) LWG UP TO 50 kcfs
- 7) TDA UP TO 178 kcfs
- 8) JDA UP TO 144 kcfs
- 9) BON UP TO 107 kcfs
- 10) DWR UP TO 37%
- 11) GCL UP TO -- (110% TDG SPILL CAP)

LEVEL 3 SPILL (122% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 55 kcfs
- 2) LGS UP TO 59 kcfs
- 3) MCN UP TO 235 kcfs
- 4) IHR UP TO 85 kcfs
- 5) LWG UP TO 61 kcfs
- 6) TDA UP TO 210 kcfs
- 7) JDA UP TO 177 kcfs
- 8) BON UP TO 120 kcfs
- 9) CHJ UP TO 200 kcfs
- 10) GCL UP TO 15 kcfs (115% TDG SPILL CAP)

¹ TDG spill cap levels are reviewed daily and are subject to change

² As measured in the tailwater and forebay of the next project downstream respectively

³ Bonneville Dam TDG levels will be managed to 120% in the tailrace – the Cascades Island gauge is out of service and the Corps will continue to use the analog from the Warrendale gauge

LEVEL 4 SPILL (125% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 75 kcfs
- 2) LGS UP TO 70 kcfs
- 3) MCN UP TO 250 kcfs
- 4) IHR UP TO 110 kcfs
- 5) LWG UP TO 70 kcfs
- 6) TDA UP TO 269 kcfs
- 7) JDA UP TO 190 kcfs
- 8) BON UP TO 215 kcfs
- 9) CHJ UP TO 210 kcfs
- 10) GCL UP TO 18 kcfs (120% TDG SPILL CAP)

LEVEL 5 SPILL (127% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 120 kcfs
- 2) LGS UP TO 95 kcfs
- 3) MCN UP TO 280 kcfs
- 4) IHR UP TO 124 kcfs
- 5) LWG UP TO 85 kcfs
- 6) TDA UP TO 294 kcfs
- 7) JDA UP TO 206 kcfs
- 8) BON UP TO 234 kcfs
- 9) CHJ UP TO 250 kcfs
- 10) GCL UP TO 21 kcfs (122% TDG SPILL CAP)

LEVEL 6 SPILL (130% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 180 kcfs
- 2) LGS UP TO 125 kcfs
- 3) MCN UP TO 321 kcfs
- 4) IHR UP TO 145 kcfs
- 5) LWG UP TO 98 kcfs
- 6) TDA UP TO 360 kcfs
- 7) JDA UP TO 250 kcfs
- 8) BON UP TO 250 kcfs
- 9) CHJ UP TO 275 kcfs
- 10) GCL UP TO 75 kcfs (125% TDG SPILL CAP)

LEVEL 7 SPILL (135% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 250 kcfs
- 2) LGS UP TO 177 kcfs
- 3) MCN UP TO 375 kcfs
- 4) IHR UP TO 240 kcfs
- 5) LWG UP TO 200 kcfs
- 6) TDA UP TO 400 kcfs
- 7) JDA UP TO 300 kcfs
- 8) BON UP TO 260 kcfs
- 9) CHJ UP TO 300 kcfs
- 10) GCL UP TO 120 kcfs (130% TDG SPILL CAP)

Proposal for Spill and TDG Management

**Revised on June 28 with updated values for TDG production estimates and the current operation as described in the June 24 email distributed to TMT.

2011 FOP Spill: Continue spill in accordance with the 2011 Spring and 2011 Summer FOPs at all fish passage projects: LWG, LGS, LMN, IHR, MCN, JDA, TDA, & BON.

Proposed Priority List for Involuntary Spill Conditions (to best manage TDG)¹

LEVEL 1 SPILL (120%/115% TDG SPILL CAP²) IS AS FOLLOWS:

- 1) LMN UP TO 28 kcfs
- 2) LGS UP TO 40 kcfs
- 3) MCN UP TO 190 kcfs
- 4) IHR UP TO 79 kcfs
- 5) LWG UP TO 41 kcfs
- 6) TDA UP TO 135 kcfs
- 7) JDA UP TO 135 kcfs
- 8) BON³ UP TO 121 kcfs
- 9) CHJ UP TO 150 kcfs

LEVEL 2 SPILL (120% TDG SPILL CAP) IS AS FOLLOWS:

- 1) CHJ UP TO 189 kcfs
- 2) LMN UP TO 40 kcfs
- 3) LGS UP TO 52 kcfs
- 4) MCN UP TO 190 kcfs
- 5) IHR UP TO 75 kcfs
- 6) LWG UP TO 48 kcfs
- 7) TDA UP TO 135 kcfs
- 8) JDA UP TO 144 kcfs
- 9) BON UP TO 107 kcfs
- 10) DWR UP TO 37%
- 11) GCL UP TO -- (110% TDG SPILL CAP)

LEVEL 3 SPILL (122% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 55 kcfs
- 2) LGS UP TO 59 kcfs
- 3) MCN UP TO 235 kcfs
- 4) IHR UP TO 85 kcfs
- 5) LWG UP TO 52 kcfs
- 6) TDA UP TO 140 kcfs
- 7) JDA UP TO 177 kcfs
- 8) BON UP TO 120 kcfs

¹ TDG spill cap levels are reviewed daily and are subject to change

² As measured in the tailwater and forebay of the next project downstream respectively

³ Bonneville Dam TDG levels will be managed to 120% in the tailrace – the Cascades Island gauge is out of service and the Corps will continue to use the analog from the Warrendale gauge

- 9) CHJ UP TO 200 kcfs
- 10) GCL UP TO 15 kcfs (115% TDG SPILL CAP)

LEVEL 4 SPILL (125% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 75 kcfs
- 2) LGS UP TO 70 kcfs
- 3) MCN UP TO 250 kcfs
- 4) IHR UP TO 110 kcfs
- 5) LWG UP TO 70 kcfs
- 6) TDA UP TO 269 kcfs
- 7) JDA UP TO 190 kcfs
- 8) BON UP TO 215 kcfs
- 9) CHJ UP TO 210 kcfs
- 10) GCL UP TO 18 kcfs (120% TDG SPILL CAP)

LEVEL 5 SPILL (127% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 120 kcfs
- 2) LGS UP TO 95 kcfs
- 3) MCN UP TO 280 kcfs
- 4) IHR UP TO 124 kcfs
- 5) LWG UP TO 85 kcfs
- 6) TDA UP TO 294 kcfs
- 7) JDA UP TO 206 kcfs
- 8) BON UP TO 230 kcfs
- 9) CHJ UP TO 250 kcfs
- 10) GCL UP TO 21 kcfs (122% TDG SPILL CAP)

LEVEL 6 SPILL (130% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 180 kcfs
- 2) LGS UP TO 125 kcfs
- 3) MCN UP TO 321 kcfs
- 4) IHR UP TO 145 kcfs
- 5) LWG UP TO 98 kcfs
- 6) TDA UP TO 360 kcfs
- 7) JDA UP TO 250 kcfs
- 8) BON UP TO 235 kcfs
- 9) CHJ UP TO 275 kcfs
- 10) GCL UP TO 75 kcfs (125% TDG SPILL CAP)

LEVEL 7 SPILL (135% TDG SPILL CAP) IS AS FOLLOWS:

- 1) LMN UP TO 250 kcfs
- 2) LGS UP TO 177 kcfs
- 3) MCN UP TO 375 kcfs
- 4) IHR UP TO 240 kcfs
- 5) LWG UP TO 200 kcfs
- 6) TDA UP TO 400 kcfs
- 7) JDA UP TO 300 kcfs

8) BON UP TO 240 kcfs

9) CHJ UP TO 300 kcfs

10) GCL UP TO 120 kcfs (130% TDG SPILL CAP)