

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 **MT** : Jim Litchfield / Brian Marotz
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday January 6, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

To check into the building, take the elevator to the 5th floor and the guard will issue you an ID badge if you need one and will take you down to the meeting room on the 4th floor. If you have NOT attended a TMT meeting in the past contact Steve Barton (503) 808-3945 so you can be added to the TMT Visitor List and issued an ID badge. This badge may be used indefinitely. If you have attended TMT in the past you may re-use your ID badge indefinitely. If you are a federal employee you will also need to have an ID badge issued to you which can be used indefinitely.

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

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for December 30, 2009 [\[Meeting Minutes\]](#)
3. Update on Water Supply Forecasts - Steve Barton, COE-RCC
 - A. [\[Snow\]](#)
 - B. Water Supply/ESP
 - i. [\[Libby\]](#)
 - ii. [\[Hungry Horse\]](#)
 - iii. [\[Albeni Falls\]](#)
 - iv. [\[Grand Coulee\]](#)
 - v. [\[Dworshak\]](#)
 - vi. [\[Brownlee\]](#)
 - vii. [\[Lower Granite\]](#)
 - viii. [\[The Dalles\]](#)

4. Comment on Water Management Plan - Fall/Winter Update - *Steve Barton, COE-RCC*
5. Update on draft fish passage plan - *Steve Barton, COE-RCC*
6. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System
 - d. Water Quality
7. Other
 - a. Set agenda and date for next meeting - **January 20, 2010**
 - b. [[Calendar 2010](#)]

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 6, 2010 Conference Call

FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Erin Halton

Notes: Christa Leonard

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 for December 23, 30 2009

Regarding the Power System section under Operations Review of both the facilitator's notes and the official meeting minutes of 12/30/09; Dave Wills, USFWS, noted that there needs to be further clarification of the 1 MAF storage statements by BPA. BPA offered the following language to add: "BPA reported that they were currently in the process of storing 1 MAF in Canada for summer flow augmentation water." There were no other comments or changes and both the facilitator's notes and the official meeting minutes for 12/23/09 and 12/30/09 will be considered final after the aforementioned edit is made to the 12/30 sets of notes.

Early Bird 2010 Water Supply Forecasts

Steve Barton, COE, directed TMT members to several links posted to the agenda. He began by reviewing the current state of the snow pack detailed on a map of the basin. Barton reported snow levels for each region as follows: Cascades- below normal, Washington- below normal with exception near the Canadian border, Canada- normal, Western Montana- below normal, Central Idaho- below normal to much below normal at Snake River headwaters.

Barton reported on the 2010 early-bird forecasts for reservoirs as follows: Columbia River headwater 83-89% of normal, Snake River 86%, Libby 88% (5.5 MAF), Hungry Horse 89% (1.78 MAF April-July), Grand Coulee 89% (48.1 MAF April-July), Dworshak 84% (22.2 MAF April-July). Steve Hall, COE, noted that regarding the Dworshak forecasts, the COE expects that by the time the official forecast is determined later in the month, it may be significantly lower, in the range of 60% of normal, with the regression forecast likely to be closer to 78% of normal. The early-bird forecast for Lower Granite was 76% of normal (16.3 MAF April-July) and The Dalles- 83% of normal (77 MAF April-July). Karl Kanbergs, COE, noted that this data comes from the River Forecast Center's January early bird forecast and that official COE data will be released later this week or next.

Kyle Dittmer, CRITFC, shared that per the most recent NOAA data, El Niño seems to be weakening (as is normal for this time of year) and thus the below normal snow conditions may result in a less than robust water year. Paul Wagner, NOAA, noted that the weather pattern appears to be tracking similarly to 2002-2003.

Action/Next Steps: There will be more in-depth 2010 Water Supply Forecast updates at the 1/20/10 TMT meeting including a presentation by Steve King from the River Forecast Center. Kyle Dittmer, CRITFC, will also supply an updated weather forecast.

Comments on Water Management Plan – Fall/Winter Update

Steve Barton, COE, reminded TMT members that both documents were finalized on 12/31/09 and have been posted to the TMT site. The COE reported that they received several comments from regional representatives that the review/comment process could be improved with better notification of deadlines and more notice given that documents have been posted and are available for review.

Action Next Steps: Barton shared with team members that comments are important to the COE and that changes and improvements to this process will be implemented this next year.

Update on Draft 2010 Fish Passage Plan

Steve Barton, COE, noted that some comments on the draft Fish Passage Plan have already been received and will be posted to the TMT webpage. Additional comments can be directed to FPOM where they will be discussed and finalized at their 1/13 meeting.

Action/Next Steps: The COE will email TMT members the link to the draft document. Comments are due to the COE by 1/14; if TMT members need to deviate from that deadline, they should contact the COE directly. This item will be on the agenda for the 1/20 TMT meeting.

Operations Review

Reservoirs: Libby was at elevation 2410.69', with inflows of 4 kcfs and outflows of 4 kcfs. Albeni Falls was at elevation 2051.49', with outflows of 15.2 kcfs. Dworshak was at elevation of 1513.02' with inflows of 2.1 kcfs and outflows of 1.6 kcfs. Lower Granite average flows were 20 kcfs, McNary average flows were 115-120 kcfs, and Bonneville average flows were 130 kcfs. Grand Coulee was at elevation 1284.9' and Hungry Horse was at 3535.54' with inflows in the range of .9-1 kcfs outflows of 2.7 kcfs.

Fish: Paul Wagner, NOAA, noted that current operations are limited to chum. He reminded TMT members of the 12/22/09 FPC spawning survey at Ives Island where 7 live, 5 dead fish and no new redds were observed. An additional survey was conducted on 12/28 when three live chum were observed. He also shared an additional report sent to him on 1/5/10: one chum and no new redds were observed, signaling the end of spawning. Wagner said the tailwater elevation has been in the 12-12.5' range and that establishment of higher redds was unlikely.

Power System: Robyn MacKay, BPA, reported that they are currently in the process of storing 1 MAF in Canada for summer flow augmentation water.

Water Quality: Scott English, COE, was introduced as the new water quality reporter to TMT. It was noted that the 2009 gas and water temperature monitoring report mailing

list is being updated in preparation for report dispersal (hard copy). The report will also be posted to the TMT site under RCC Water Quality Program- Annual TDG and Temperature Report.

Other: Richelle Beck asked if a decision has been made in regards to Lake Pend Oreille. Steve Barton, replied that comments are still being reviewed and that a decision is expected next week, at the earliest.

The 2010 TMT meeting calendar will be tentatively set for every other Wednesday and will be held in the Columbia Room at the COE unless otherwise noted on the agenda. If there are any room reservation issues, the COE will contact Paul Wagner to see if the NOAA 10th Floor conference room could be used as an alternative meeting space.

TMT Schedule: The TMT meeting will be: **face-to-face on 1/20/2010 at 9:00am**

Agenda items will include:

- Notes Review
- January Final Water Supply Forecasts / Steve King Presentation
- Draft 2010 Fish Passage Plan - Update
- The Dalles Spillwall Construction - Update
- Summary of Zero Nighttime Flow on the Lower Snake River
- Operations Review

**Columbia River Regional Forum
Technical Management Team Meeting
January 6, 2010**

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting), with representatives of COE, USFWS, NOAA, CRITFC, BPA, BOR, Washington, Montana, Idaho and others participating. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at the meeting. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for December 23 and 30, 2009

Dave Wills (USFWS) commented that both the facilitator's notes and meeting minutes for December 30 refer to storage of 1 maf, which needs more explanation for the casual reader. That's 1 maf of flow augmentation BPA stores in Canada every year, Robyn MacKay said. BPA will add that explanation to the notes and the official minutes.

3. Update on Water Supply Forecasts

Steve Barton (COE) showed TMT a graphic attached to today's agenda that depicts the current state of snowpack throughout the Columbia and Snake basin. Many areas of the basin are way below normal in terms of snowpack. Northern Washington near the Canadian border is near normal, and points in Canada are hovering around normal. Snowpack along the Montana continental divide is normal to slightly below normal. But the trend is below normal in the Bitterroot Mountains in northern and central Idaho.

Basin-wide, the snowpack in the Columbia mainstem is 83-89% of normal, but only 76-84% of normal in the Snake River basin.

Jim Litchfield (Montana) asked about Noisy Basin Snotel station east of the Idaho panhandle. There are problems at that station which has been giving false data, John Roache (BOR) replied.

Barton then reviewed the early bird RFC forecasts project by project, also attached to today's agenda. These are not the official COE forecasts – those will be released next Monday, January 11, Karl Kanbergs (COE) pointed out.

The El Nino trend is weakening, but that may be a moot point because the damage to the water supply early in the year is already done, Kyle Dittmer (CRITFC) noted. The year 2010 is probably not going to be a robust water year.

The RFC early bird water supply forecasts generally show below average water supply, with project-specific forecasts as follows:

- Libby – 88% of normal, or 5.5 maf. Inflows for April-August are projected to be about 700 kaf at this early point.
- Hungry Horse – 89% of normal, or 1.78 maf for April-July. The BOR will release an official forecast for Horse soon, probably by January 8. Snowpack for the Flathead Basin is currently around 94% of normal.
- Grand Coulee – 89% of normal, or 48.1 maf.
- Dworshak – 84% of normal for April-July, or 2,220 kaf. The COE official forecast will most likely be low, as there's only 67% of normal snowpack in the basin now. The regression forecast is a little more optimistic, showing Dworshak basin at 76% of normal.
- Lower Granite – 76% of normal for January-July, or 22.7 maf (16.3 maf for April-July).
- The Dalles – 83% of normal, or 89.3 maf for January-July (77.5 maf for April-August).

When TMT meets next on January 20, there will be much more detailed information available regarding inflow forecasts, as well as the El Nino dry weather trend. The updated COE and National Weather Service forecasts and other products will be available for presentation and discussion.

The winter of 2009-10 is beginning to resemble the winter of 2002-03 in terms of water supply, Wagner and Dittmer agreed. Ocean conditions in the tropical Pacific may be overly warm, but conditions on the Northwest coast are cooler and more hospitable to salmon, Dittmer noted.

4. Comment on Water Management Plan and the WMP Fall/Winter Update

Both of these documents were finalized on December 31, Steve Barton (COE) reported. Based on complaints about the comment process, the COE plans to tighten it so all comments can be incorporated more quickly.

5. Update on Draft Fish Passage Plan

Comments the COE has received to date are being processed, Barton reported. The schedule as established in FPOM meetings is to complete the FPP comment process at the next FPOM meeting on January 14. Russ Kiefer noted that he might submit comments later than January 14 because of problems accessing the draft passage plan over the winter break, when he'd set aside time to review it in detail. Kiefer's comments need to be policy-reviewed by IDFG before he can submit them to the COE, which can be a slow process.

There was general agreement that, in future, the COE will email TMT participants the link to draft documents when they are made available for review. TMT will revisit the Fish Passage Plan at its next meeting January 20.

6. Operations Review

a. Reservoirs. Libby is at elevation 2,410.69 feet, with inflows just below 4 kcfs and outflows at the 4 kcfs minimum. Albeni Falls is at elevation 2,051.49 feet, passing inflows of 15.2 kcfs. Dworshak is at elevation 1,513.07 feet, with inflows of 2.1 kcfs and discharges of 1.6 kcfs.

Grand Coulee is at elevation 1,284.9 feet. Hungry Horse is at elevation 3,535.54 feet, with discharges of 2.7 kcfs and inflows of 900-1,000 cfs.

Daily inflow averages are around 20 kcfs at Lower Granite, 115 kcfs at McNary, and 130 kcfs at Bonneville.

b. Fish. The only potential activity in the basin this time of year would be chum spawning, Wagner said. The last live counts were taken on December 22 (7 live chum and 5 dead ones in the Ives Island area) and December 28 (one live chum and no new redds). This information supports TMT's earlier conclusion that the chum spawning operation could switch to a daytime minimum tailwater elevation with no maximum. The daytime operation has since remained within the 12-12.5-foot range, and any further spawning at this point is highly unlikely.

c. Power System. As reported previously, BPA is in the process of storing 1 maf of water in Canada for flow augmentation later this year.

d. Water Quality. Laura Hamilton (COE) introduced the new RCC water quality team leader Scott English, who gave an update. The COE has just completed a 2009 temperature and gas monitoring report, which will be available in hard copy form as well as electronically via the TMT web site.

9. Next Meeting

The next regularly scheduled TMT meeting will be January 20. TMT members discussed holding meetings biweekly through February, then possibly weekly in March. Jim Litchfield (Montana) suggested scheduling the March in-person meetings biweekly, with conference calls in between. This summary prepared by consultant and writer Pat Vivian.

Name	Affiliation
Steve Barton	COE
Dave Wills	USFWS
Paul Wagner	NOAA
Doug Baus	COE
Jim Litchfield	Montana
Kyle Dittmer	CRITFC
Scott English	COE
Laura Hamilton	COE
Russ George	WMC
Tim Heizenrader	Centaurus

Rob Diaz
Karl Kanbergs

Integral Renewables
COE

Phone:

Cindy LeFleur
Robyn MacKay
John Roache
Russ Kiefer
Joel Fenolio
Holli Krebs
Steve Hall
Rob Allerman
Dave Benner
Ruth Burris
Richelle Beck
Tom Le
Terra Kelly

Washington
BPA
BOR
Idaho
COE Seattle
JC Morgan
COE Walla Walla
Deutsch Bank
FPC
PGE
DRA
Puget Sound Energy
JP Morgan

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TMT MEETING

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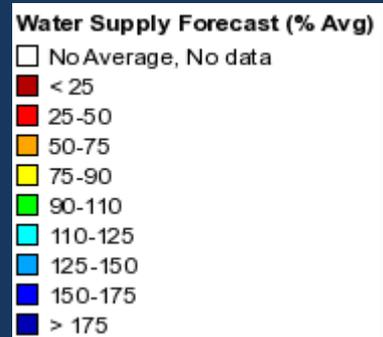
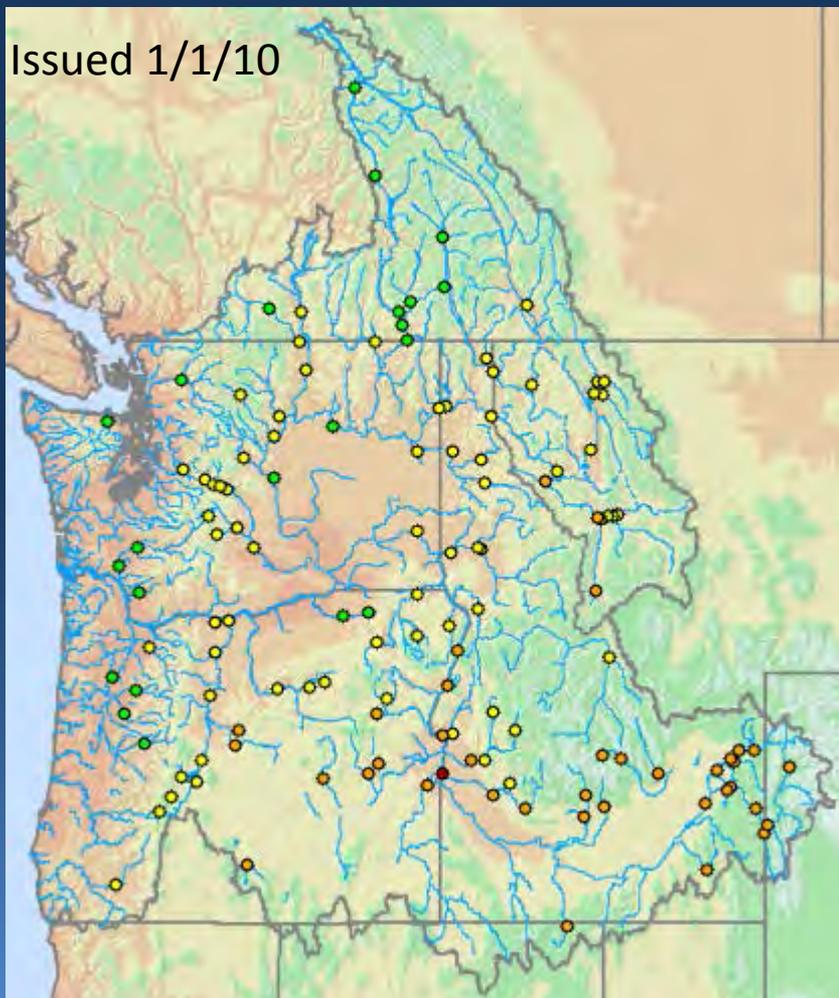
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AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for January 06, 2010 [\[Meeting Minutes\]](#)
3. Water Supply Forecasts/Flood Control - Steve King, National Weather Service, River Forecast Center
 - a. [Power Point Overview](#)
4. Draft 2010 Fish Passage Plan Update - Steve Barton, COE-RCC
5. Albeni Falls Update - Steve Barton, COE-RCC
6. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System
 - d. Water Quality
7. Other
 - a. Set agenda and date for next meeting - **February 3, 2010 Reminder: NOAA Fisheries, 10th Floor, St.**



Northwest River Forecast Center Water Supply Briefing



Jan 1st "Final" Forecast

Legacy Regression Model

Agency Coordinated

Canadian Forecast for Canada



Observed Conditions



Precipitation

Snowpack

Runoff



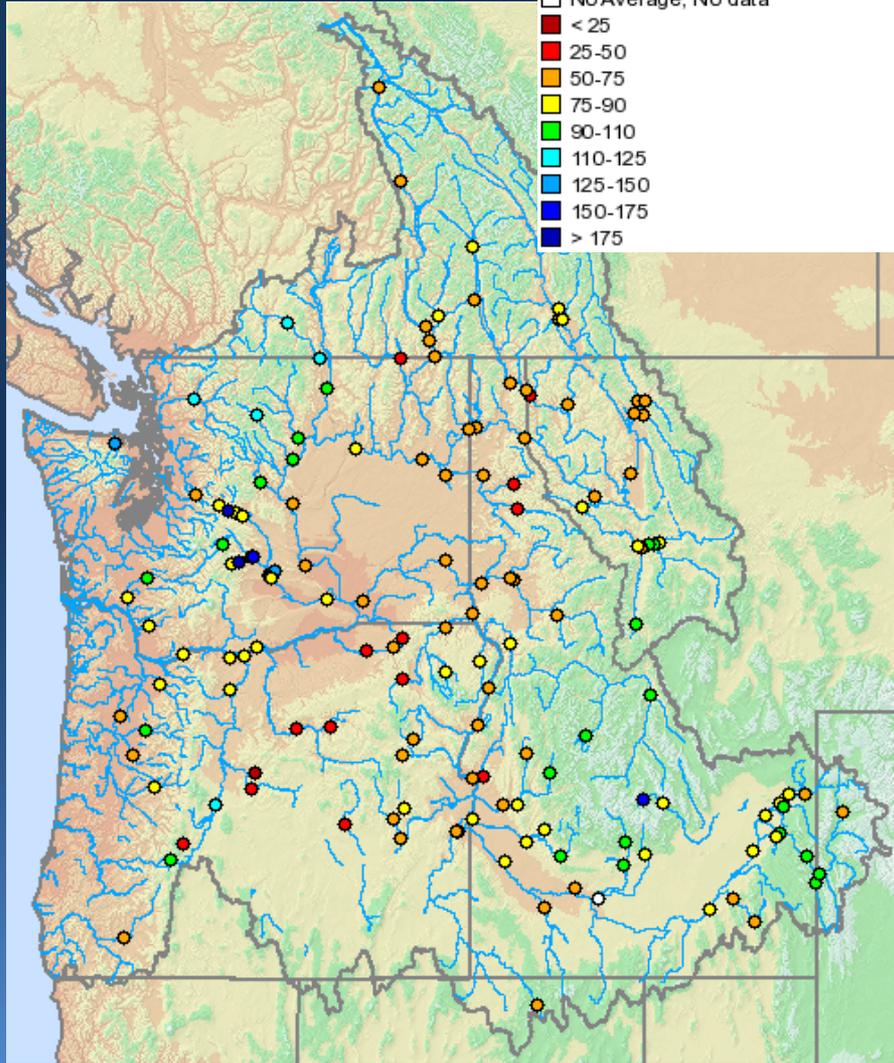
Current Runoff Conditions



Jan 11, 2010

Water Year Runoff Summary (% Avg)

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

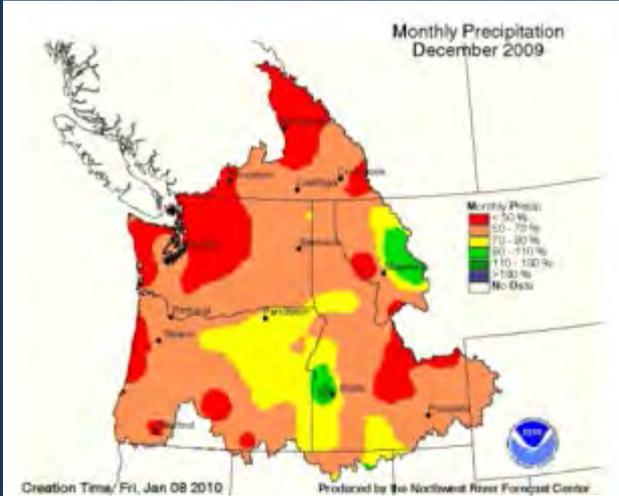
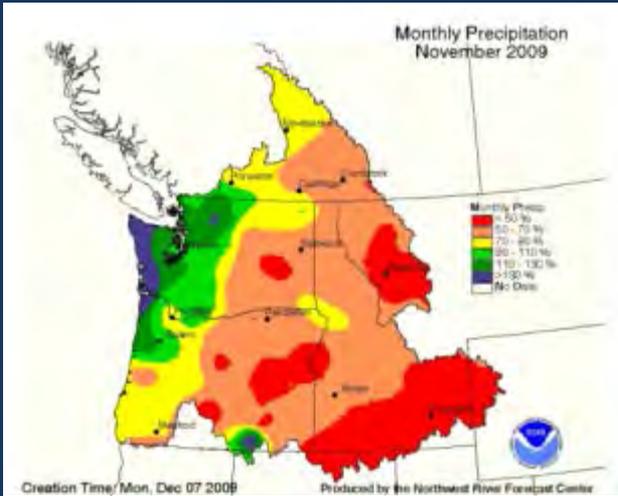
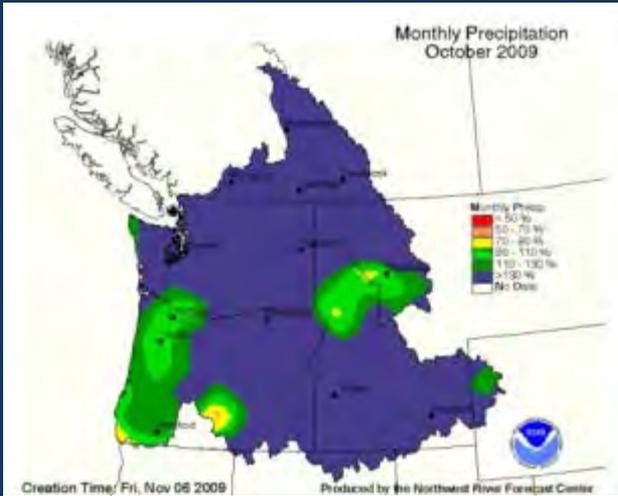




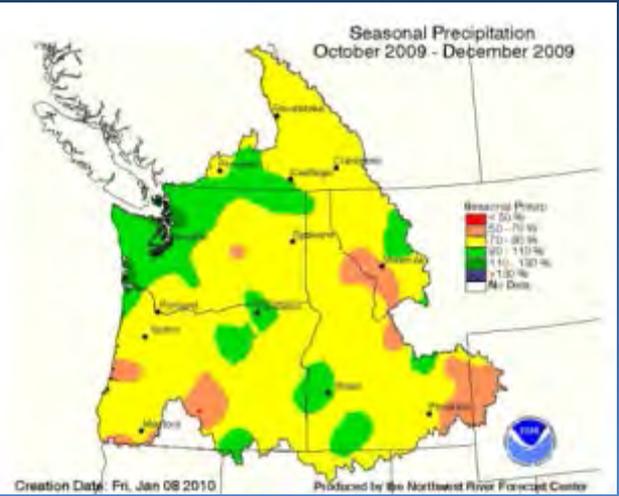
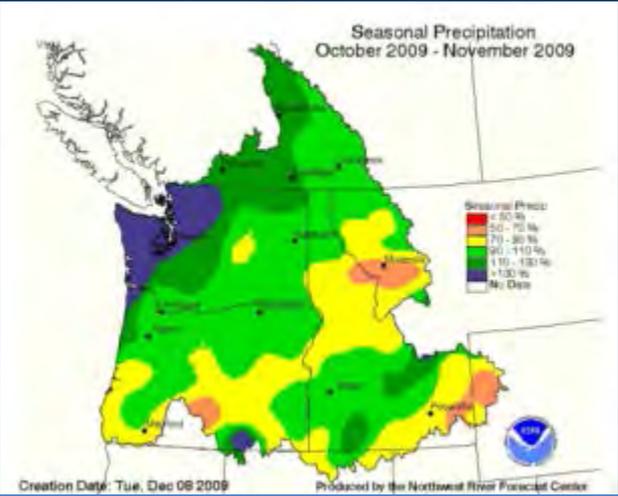
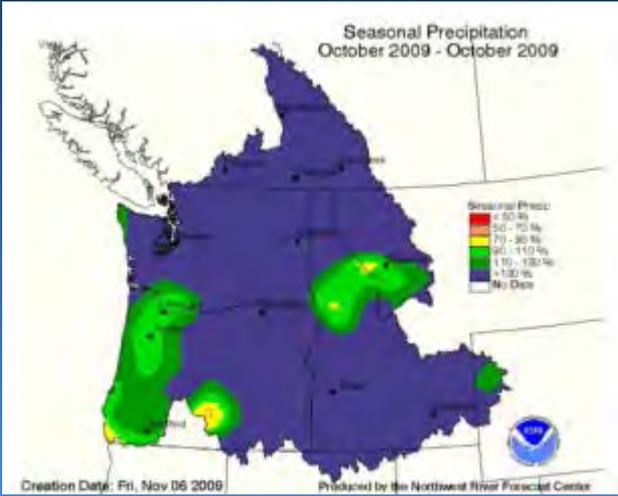
Observed Precipitation



By Month (Oct, Nov, Dec)

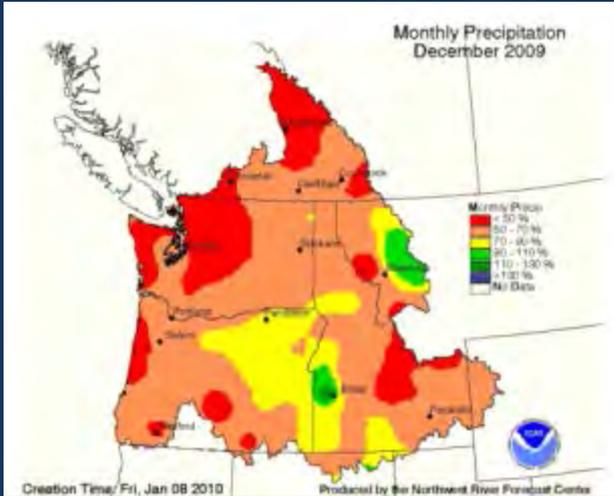


Seasonal (Trend)





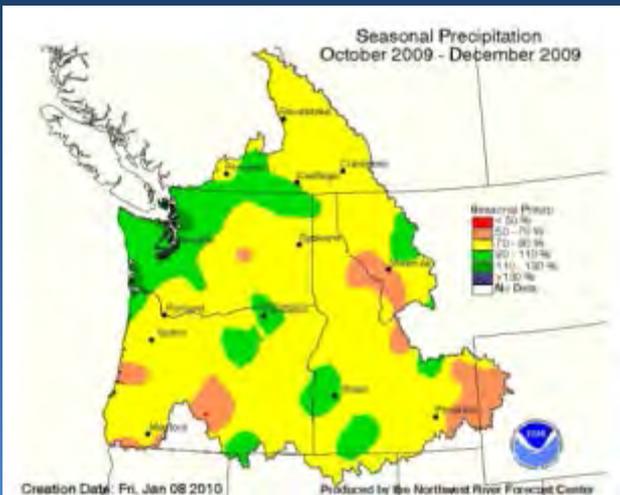
Observed Precipitation



Columbia Basin Seasonal Precipitation Division Averages Northwest River Forecast Center

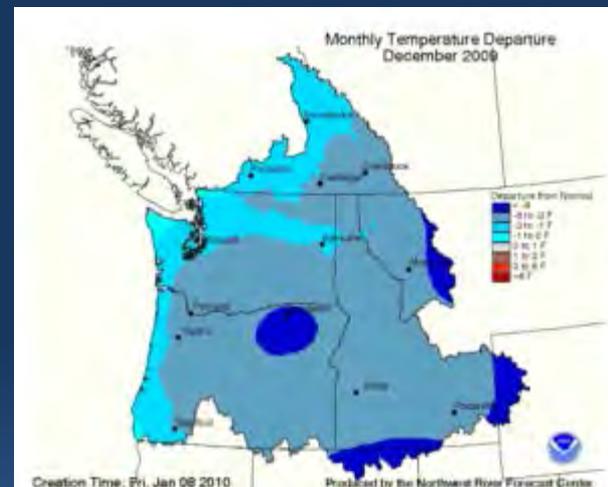
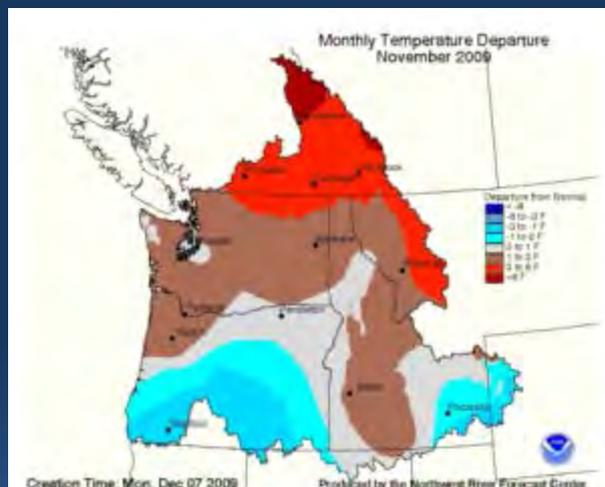
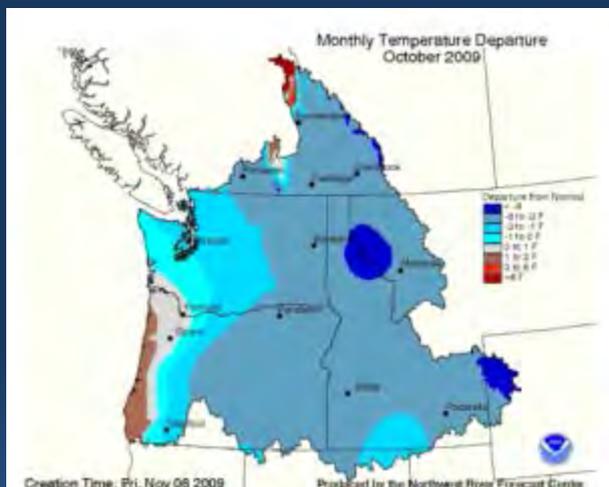
(Weekly Summary: 12Z Jan 1 - 18, 2010)

DIVISION	..JAN TO DAY 18..		OCT - JAN....		
	OBSD	DEP	PCT AV	OBSD	DEP	PCT AV
COLUMBIA ABOVE COULEE	1.48	-0.09	94.	7.99	-1.33	86.
SNAKE RV AB ICE HARBOR	1.06	-0.09	93.	5.18	-1.02	84.
COLUMBIA AB THE DALLES	1.52	-0.10	94.	7.87	-1.22	87.
COLUMBIA AB CASTLEGAR	2.04	-0.29	87.	11.20	-2.25	83.
KOOTENAI	1.85	0.24	115.	8.70	-1.01	90.
CLARK FORK	0.78	-0.26	75.	4.45	-1.28	78.
FLATHEAD	1.17	-0.14	89.	7.22	-0.62	92.
PEND OREILLE/ SPOKANE	1.73	-0.52	77.	10.40	-2.35	82.
NORTHEAST WASHINGTON	1.51	0.43	140.	7.09	0.26	104.
OKANOGAN	1.16	0.16	116.	5.24	-0.52	91.
EAST SLOPES WASH CASC.	3.97	0.08	102.	16.99	-3.43	83.
CENTRAL WASHINGTON	1.02	0.40	165.	3.52	-0.26	93.
UPPER SNAKE	1.12	-0.19	86.	5.35	-1.56	77.
SNAKE RIVER PLAIN	0.54	-0.12	81.	2.97	-0.65	82.
OWYHEE/ MALHEUR	0.75	0.03	104.	3.61	-0.28	93.
SALMON/ BOISE/ PAYETTE	1.54	0.09	106.	6.89	-0.84	89.
BURNT/ GRANDE RONDE	0.99	-0.08	92.	5.26	-0.79	87.
CLEARWATER	1.75	-0.35	83.	9.02	-2.41	79.
SOUTHEAST WASHINGTON	1.27	-0.03	98.	6.12	-1.56	80.
UPPER JOHN DAY	0.99	0.05	106.	4.98	-0.42	92.
UMATILLA/ LWR JOHN DAY	1.14	0.03	103.	6.39	0.04	101.
UPR DESCHUTES/ CROOKED	1.20	-0.02	98.	5.86	-0.32	95.
HOOD/ LOWER DESCHUTES	3.10	0.59	124.	13.95	0.36	103.
NW SLOPE WASH CASCADES	8.80	1.45	120.	41.19	-0.52	99.
SW WA CASCADES/COWLITZ	7.48	1.49	125.	30.71	-2.95	91.
WILLAMETTE VALLEY	5.08	0.10	102.	23.94	-4.10	85.
ROGUE/ UMPQUA	3.10	0.14	105.	13.53	-3.50	79.





Observed Monthly Temperature



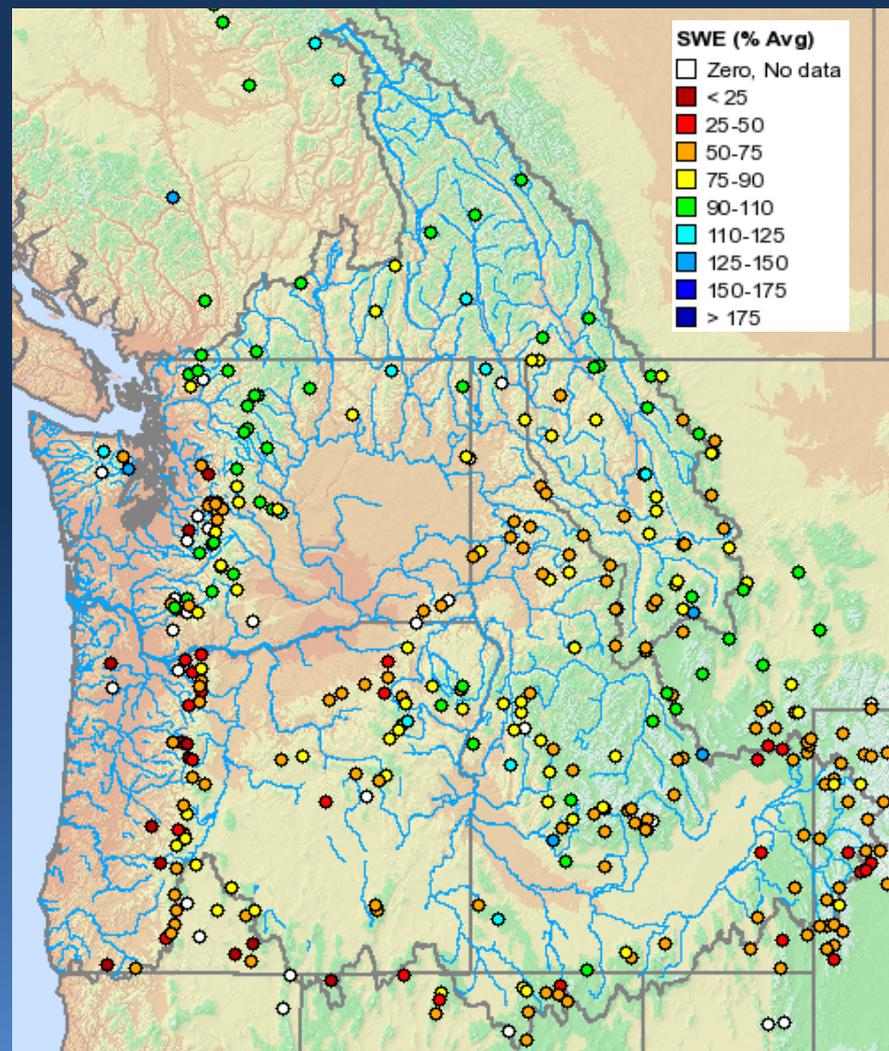
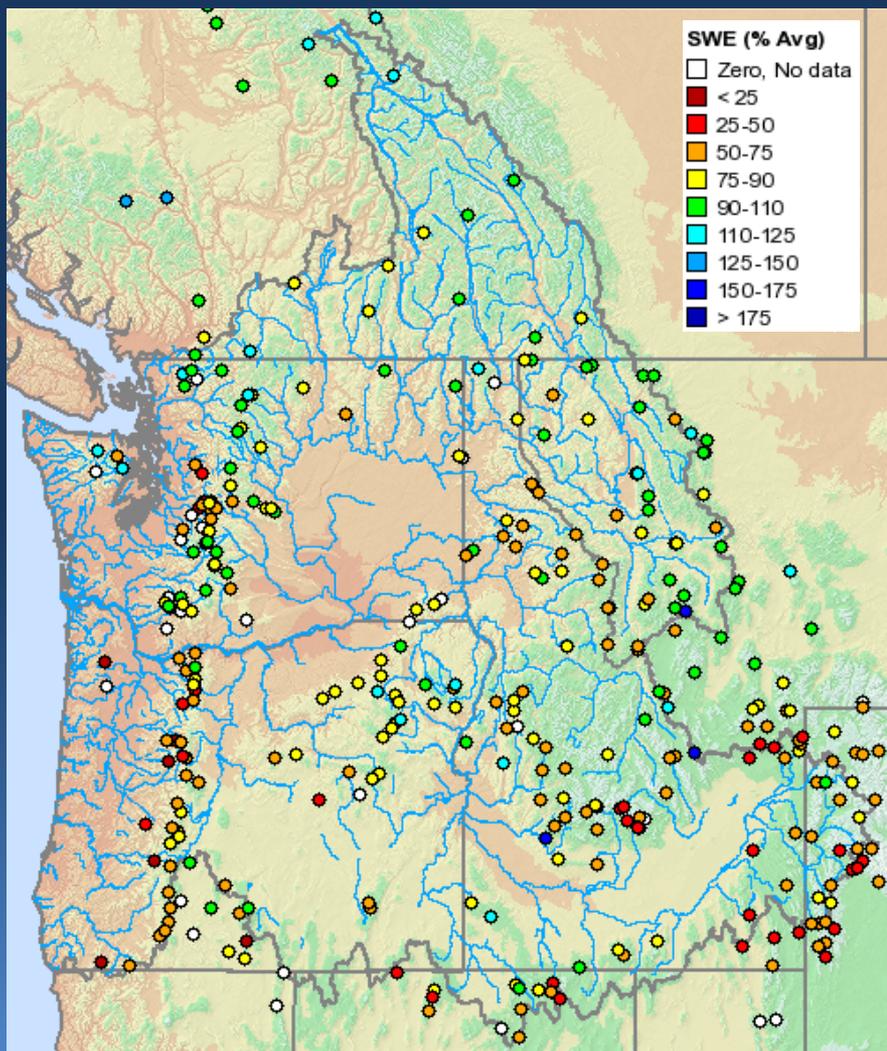


Current Snow Conditions



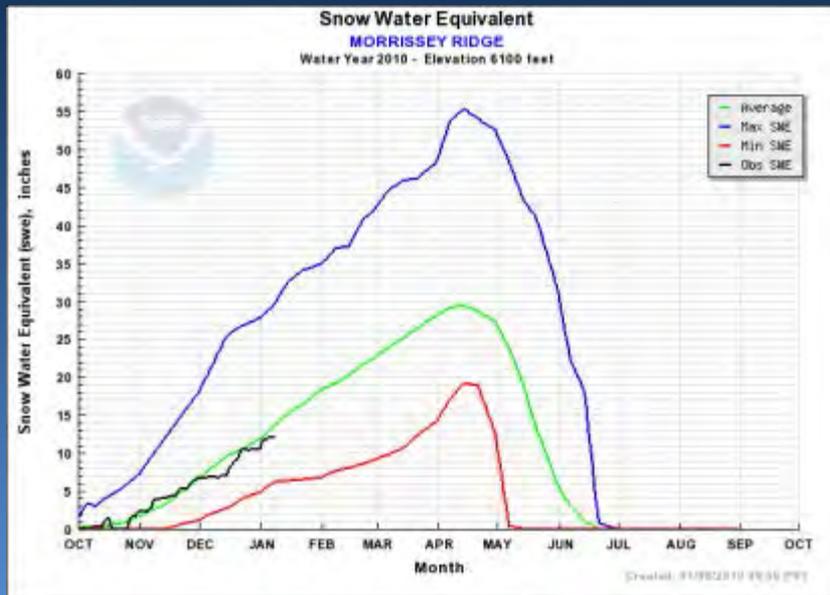
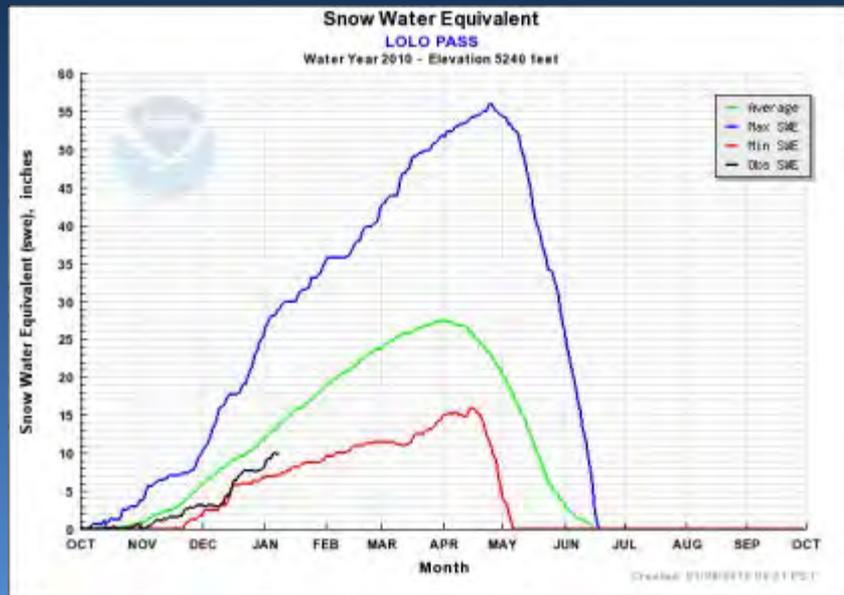
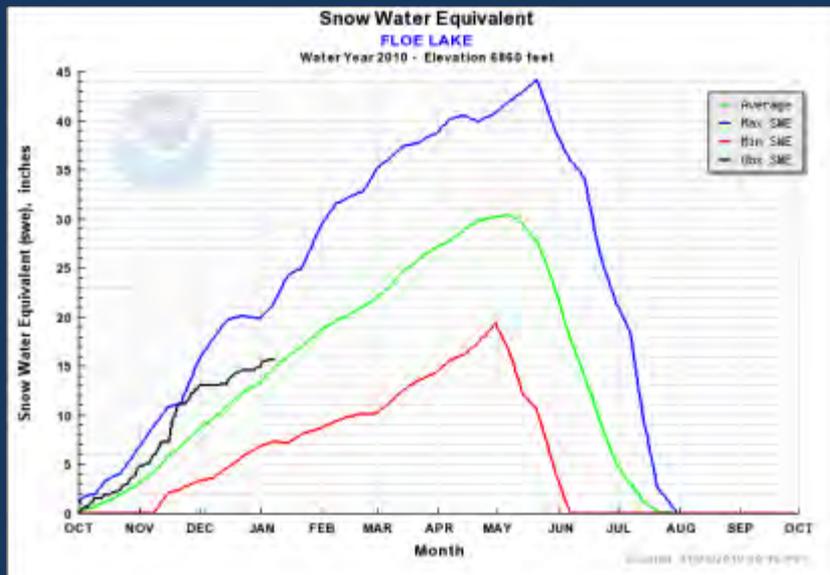
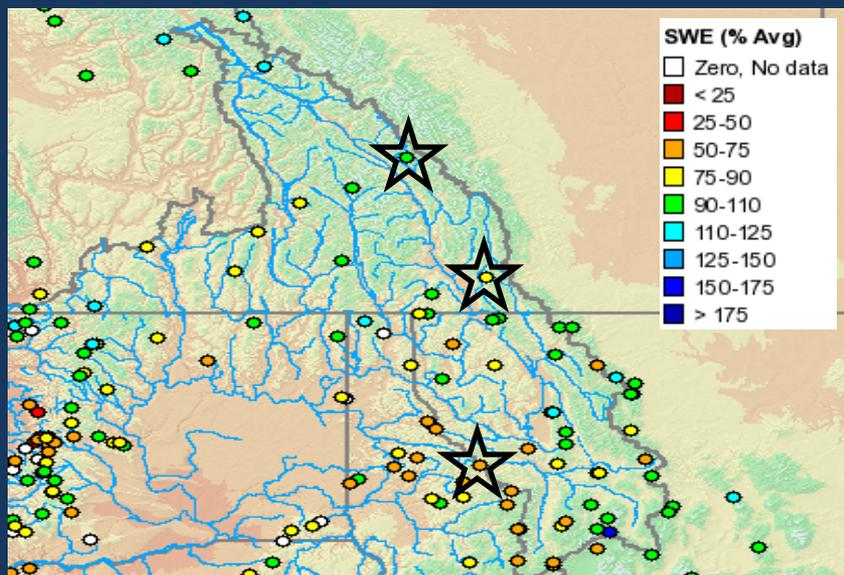
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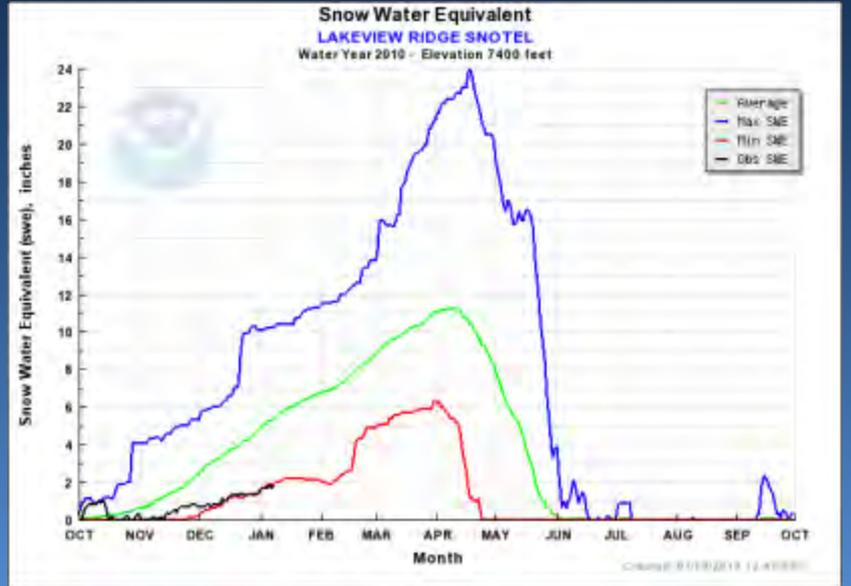
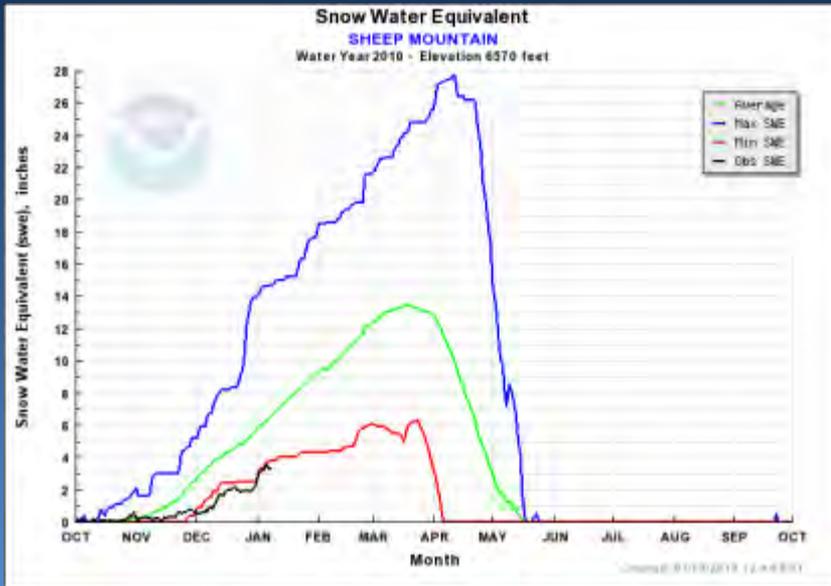
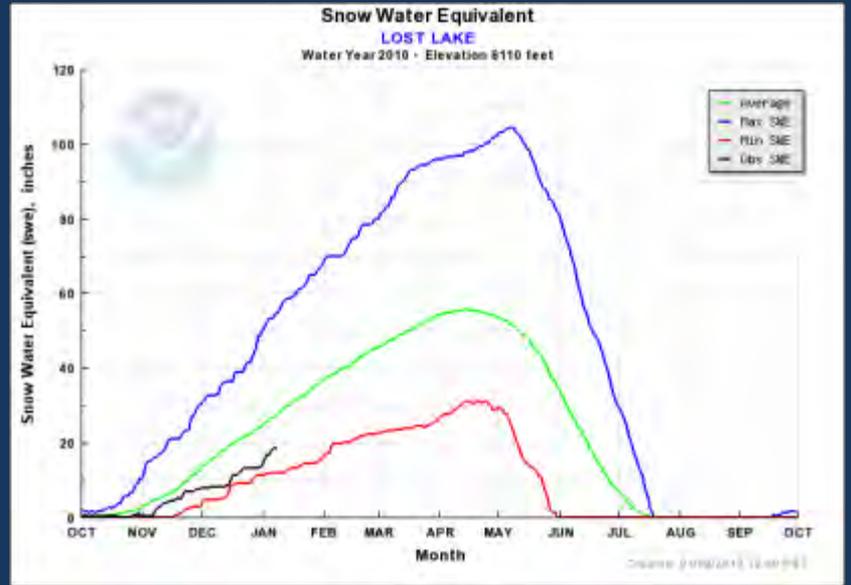
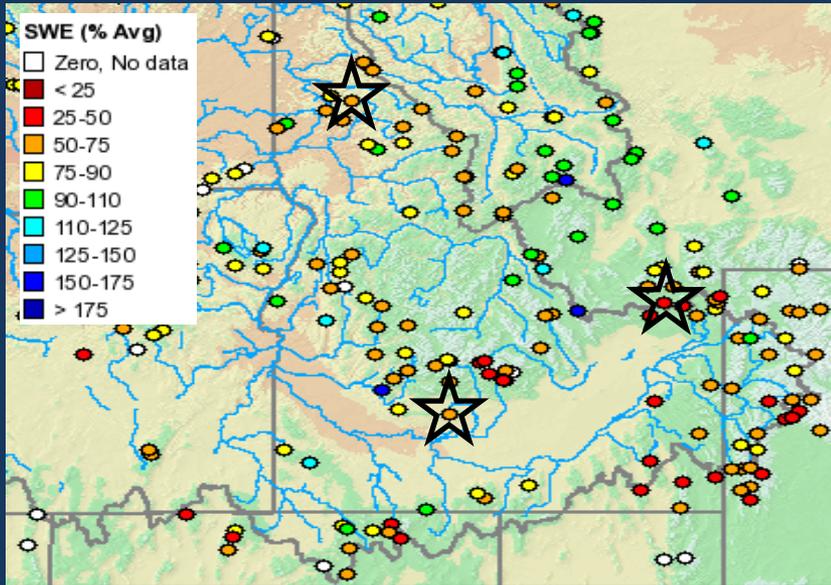


Upper Columbia Snow Conditions

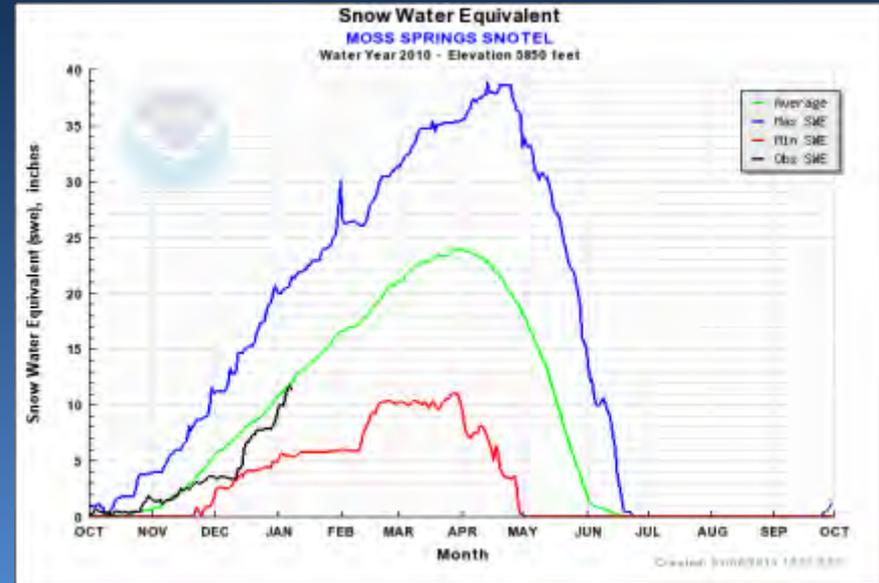
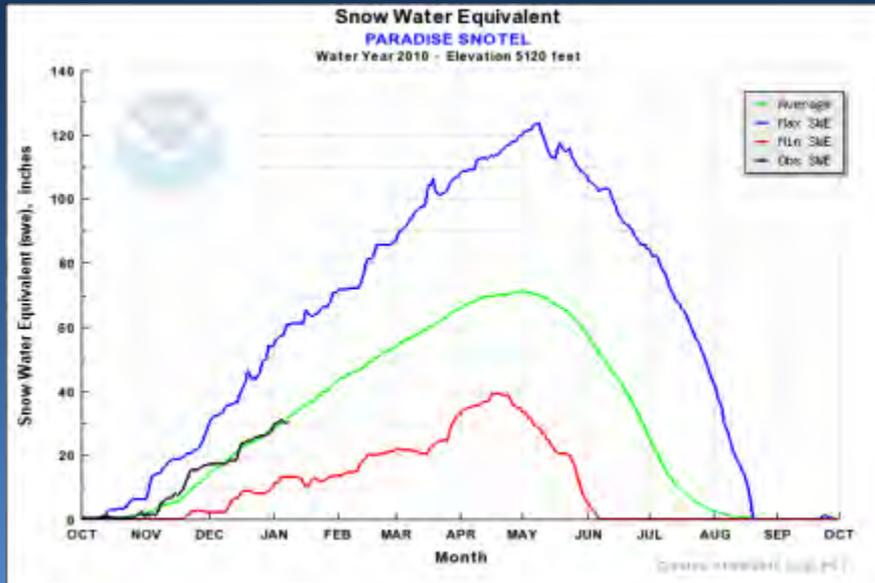
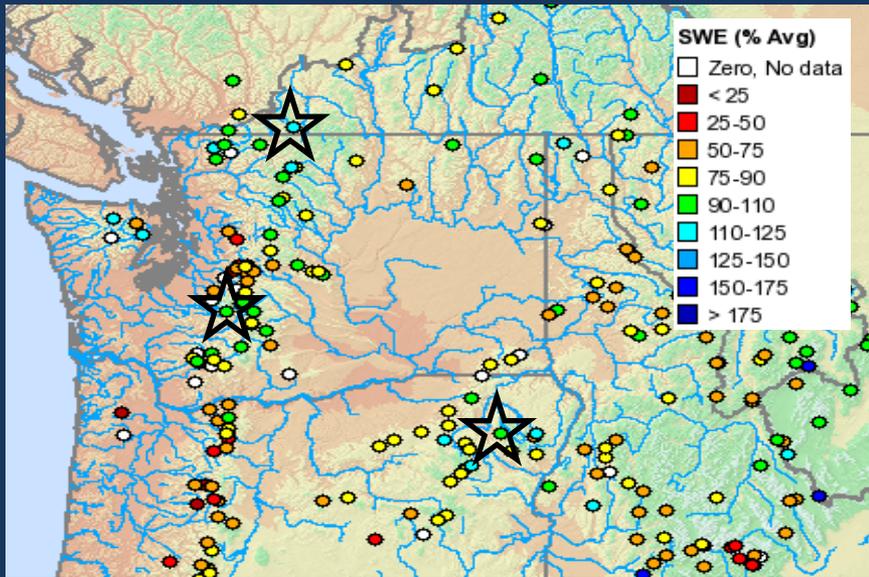




Snake River Snow Conditions



Lower Columbia Snow Conditions





Future Conditions



Climate Outlooks

Short Term Precipitation Forecast

Water Supply Forecasts

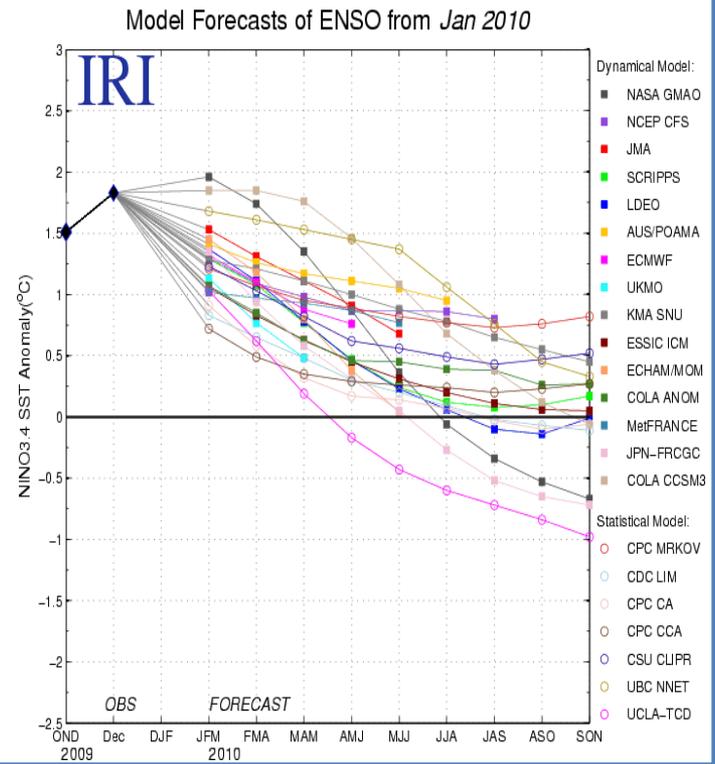
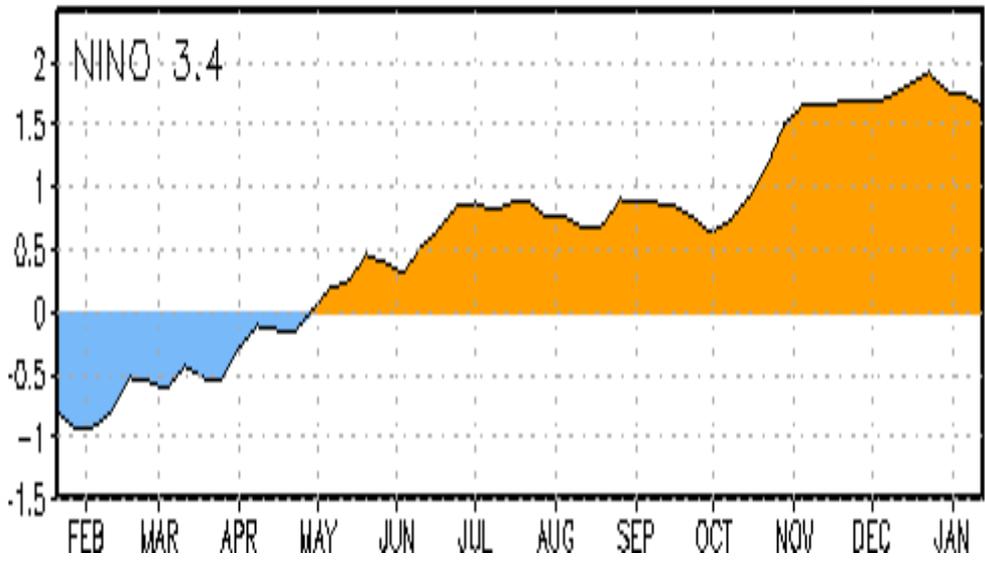


Enso: Observed and Forecast

SST Anomaly (Deg C)



Observed: SST 3.4 = 1.7 D eg C



CPC Synopsis: El Niño is expected to continue at least into spring of 2010

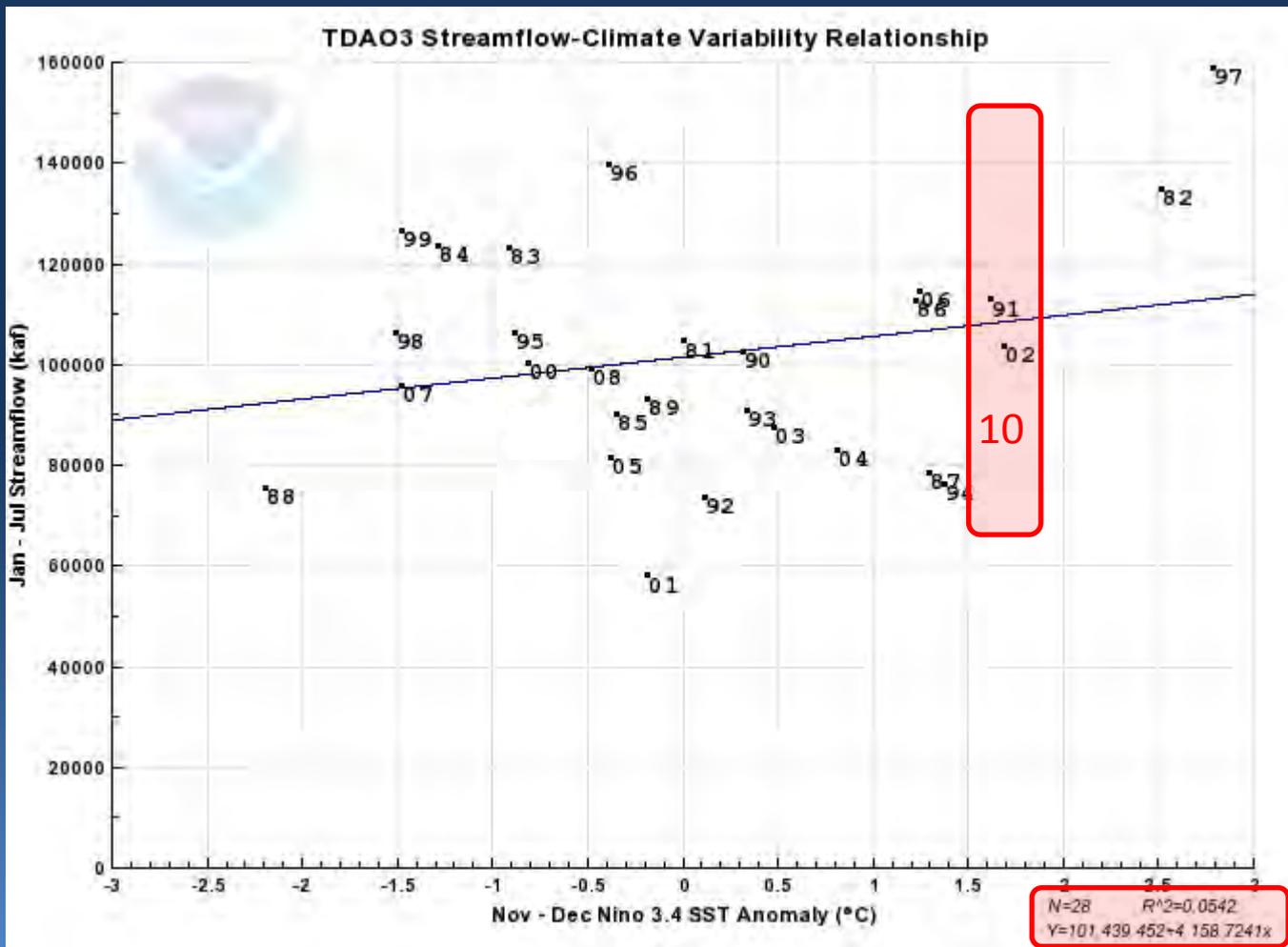
Source: El Niño/Southern Oscillation (ENSO) Diagnostic Discussion, Jan 7, 2010
http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/enso_advisory/index.shtml



SST Anomaly vs Streamflow

The Columbia River at The Dalles

Nov-Dec SST vs Jan-Jul Runoff

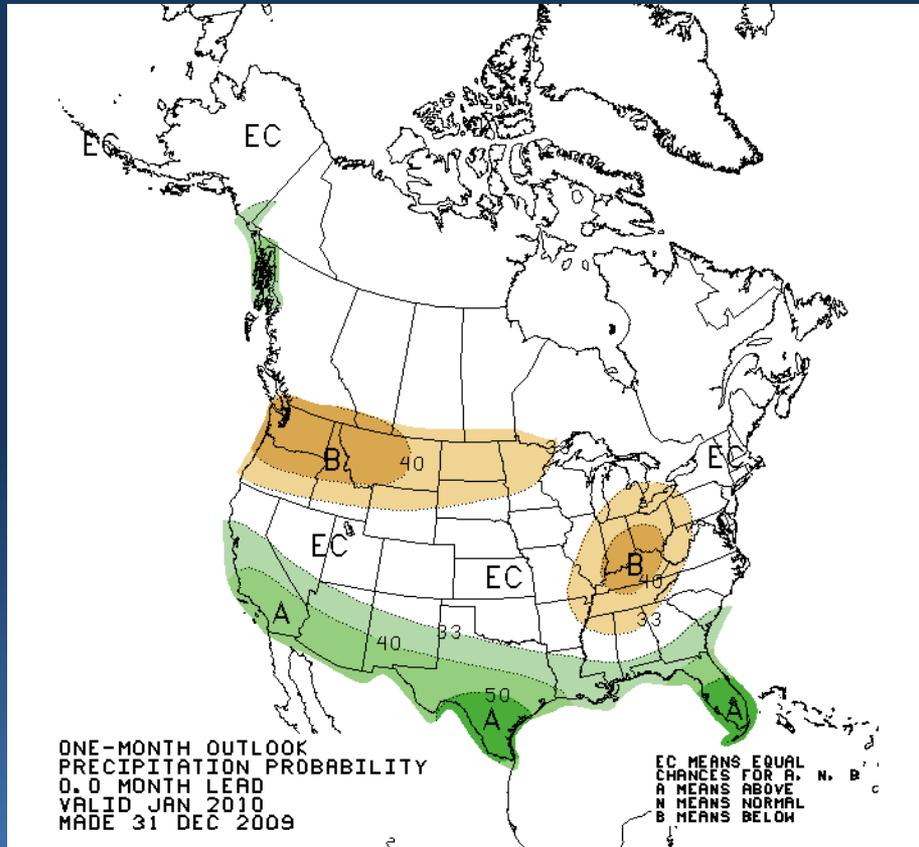




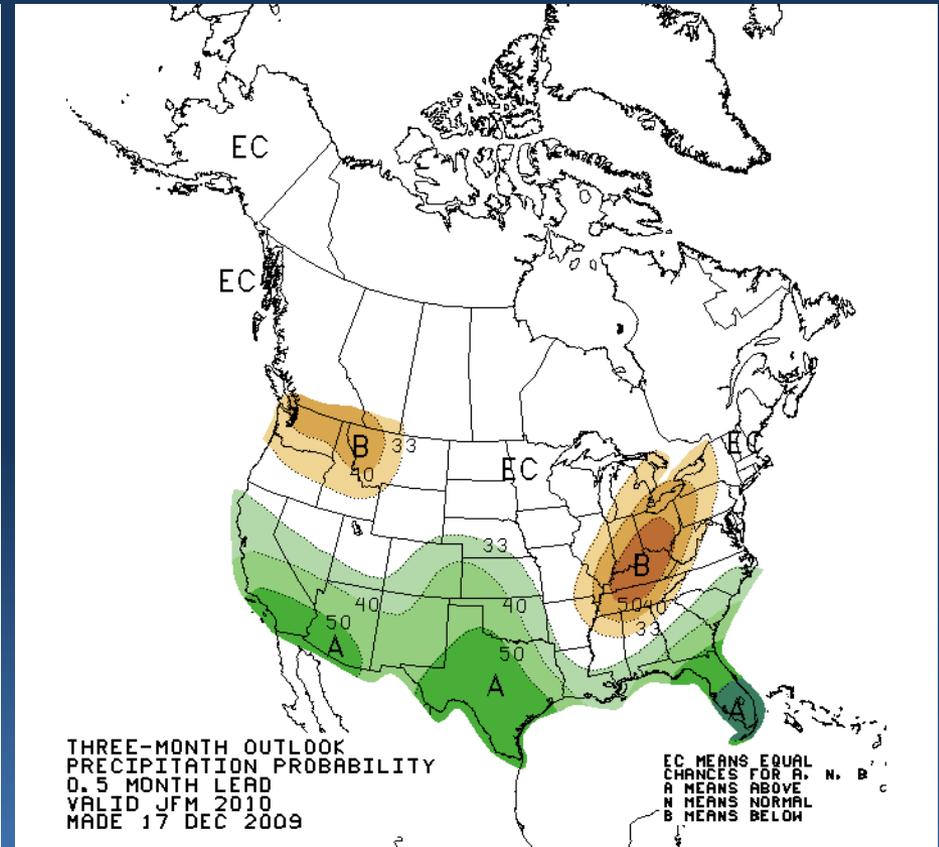
Climate Outlook: Precipitation



Current Month Outlook



Three Month Outlook

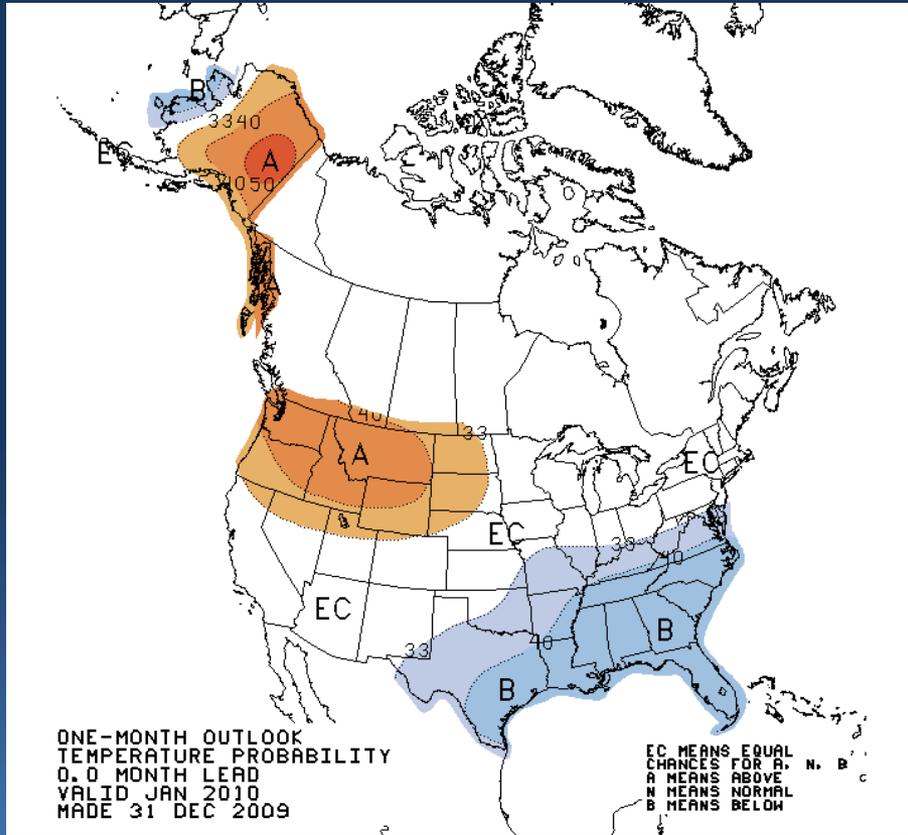




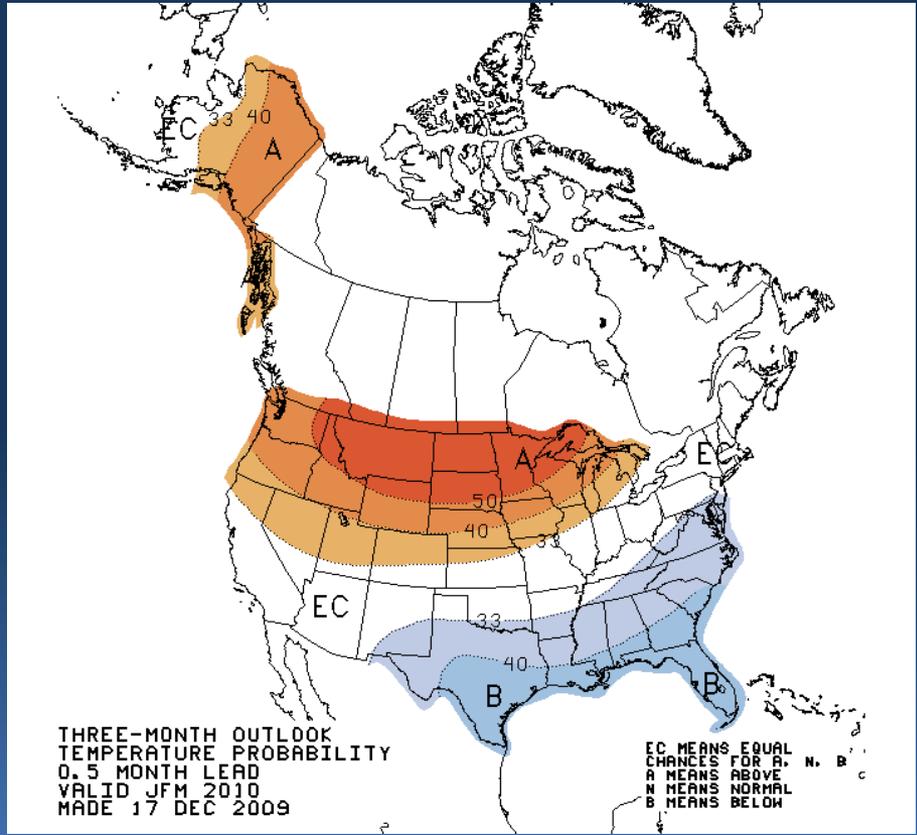
Climate Outlook: Temperature



Current Month Outlook

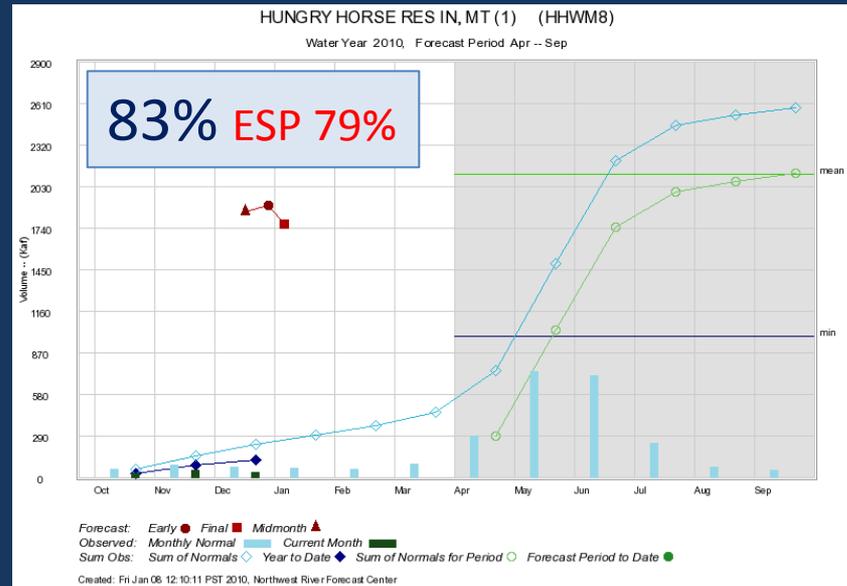


Three Month Outlook



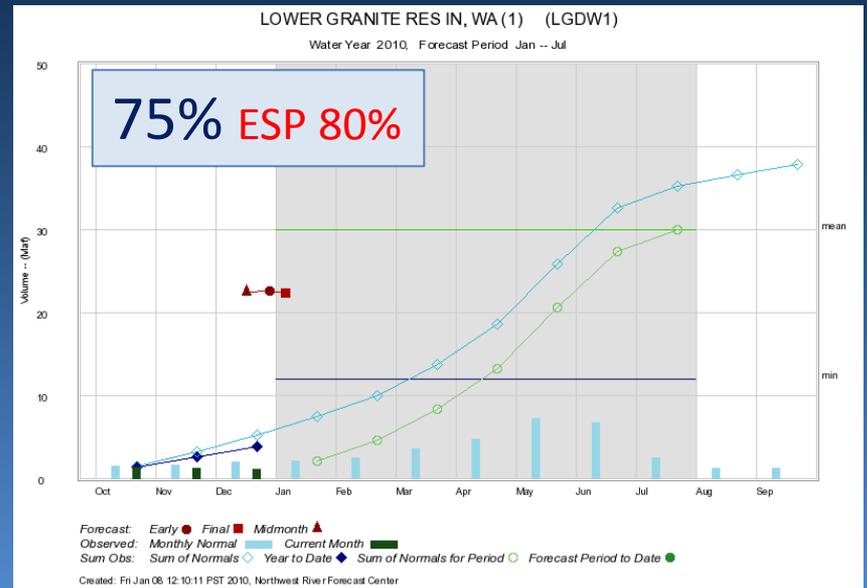
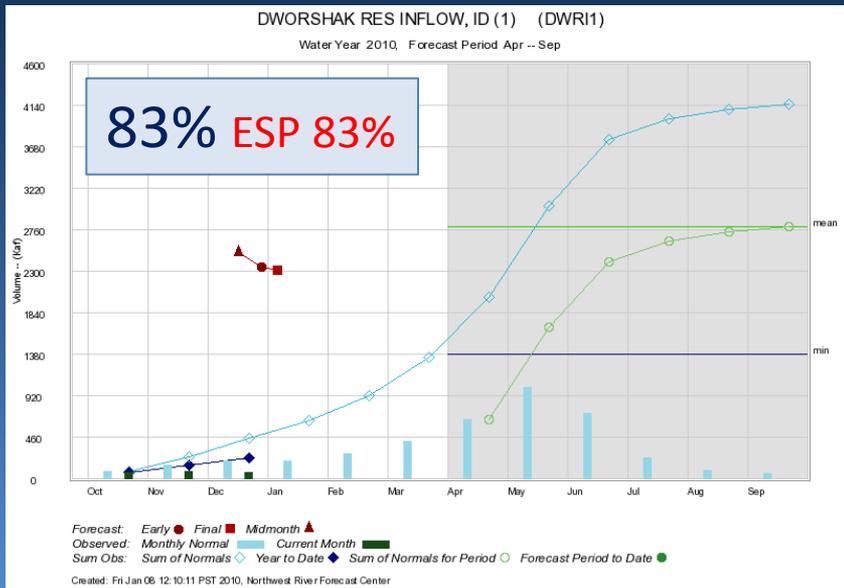
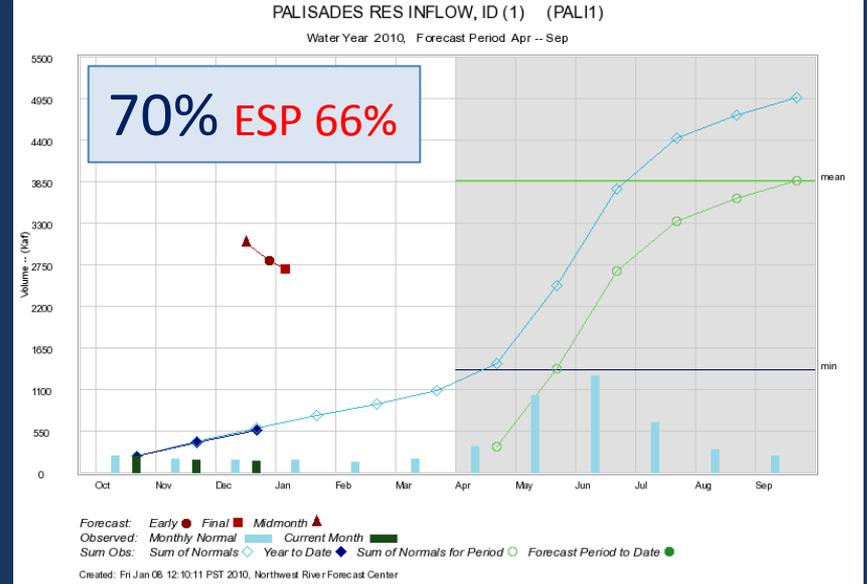
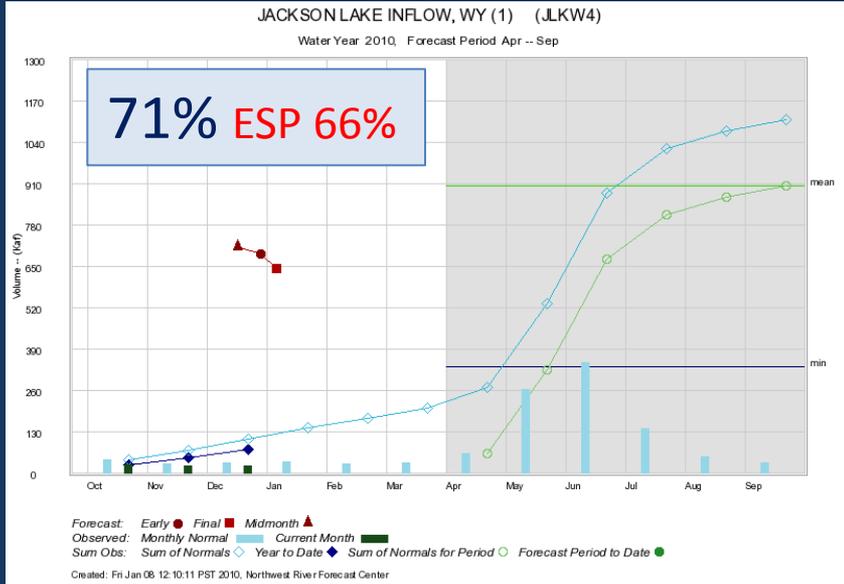


Water Supply Forecast: Upper Columbia



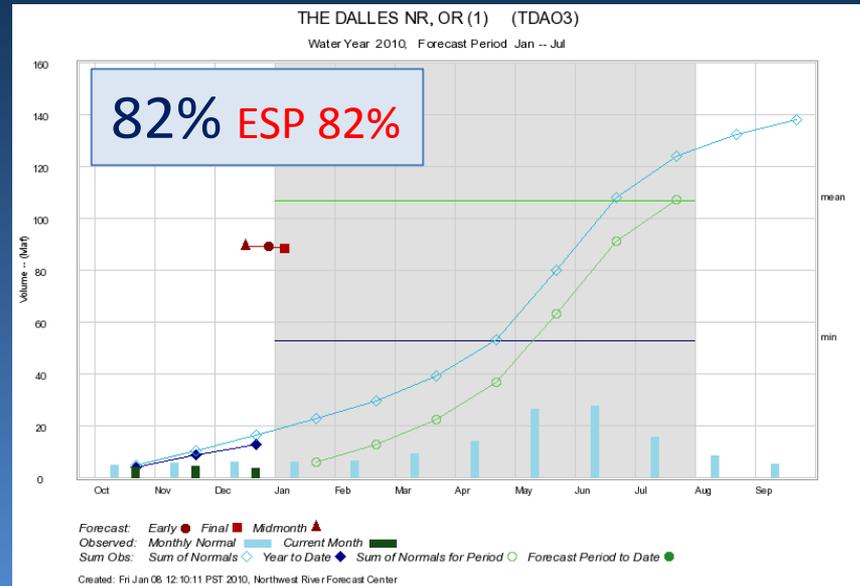
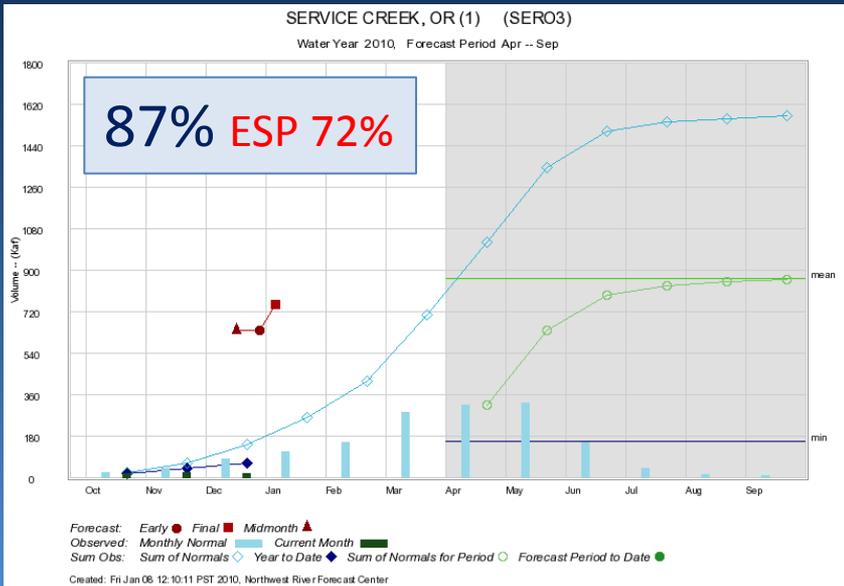
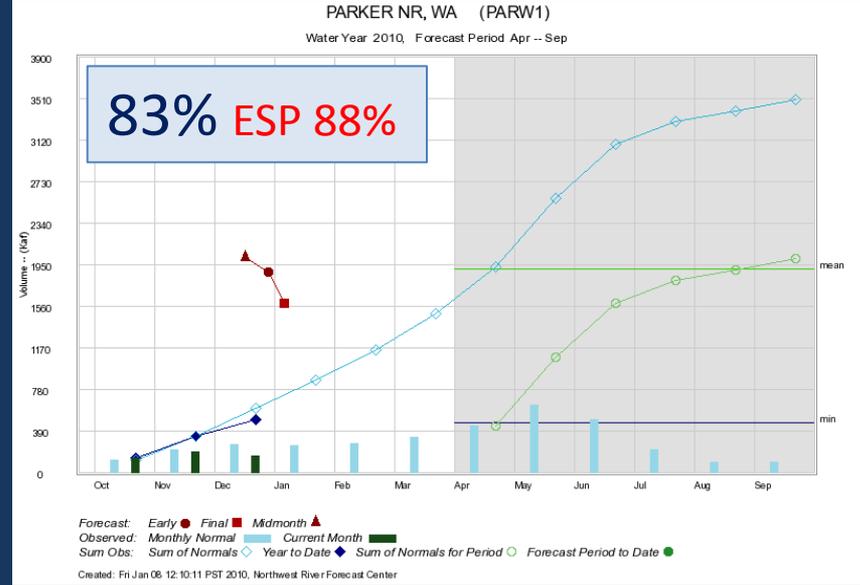
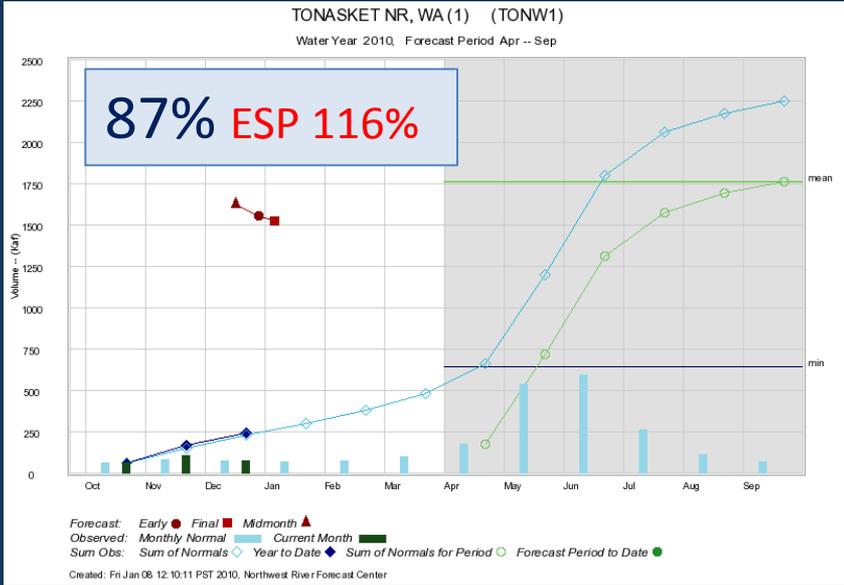


Water Supply Forecast: Snake





Water Supply Forecast: Lower Columbia





Water Supply Forecast Summary

Compared to Historical Observed 1961-2009 (49 years)

Grand Coulee

Year	Jan-Jul Vol (MAF)	Rank	Exceedance Prob
2008	59.65	29	56.863 %
1980	59.33	30	58.824 %
1995	59.04	31	60.784 %
1998	58.94	32	62.745 %
1963	57.55	33	64.706 %
2010	56.30	34	66.667 %
2005	54.39	35	68.627 %
1989	54.33	36	70.588 %
1970	54.20	37	72.549 %
2003	54.18	38	74.510 %
1985	52.03	39	76.471 %

Lower Granite

Year	Jan-Jul Vol (MAF)	Rank	Exceedance Prob
1979	24.08	30	61.224 %
2002	23.98	31	63.265 %
2003	23.81	32	65.306 %
1961	23.48	33	67.347 %
1968	22.75	34	69.388 %
2010	22.40	35	71.429 %
1990	20.70	36	73.469 %
2004	20.68	37	75.510 %
1991	20.12	38	77.551 %
1966	19.66	39	79.592 %
2007	18.89	40	81.633 %

The Dalles

Year	Jan-Jul Vol (MAF)	Rank	Exceedance Prob
1989	93.02	34	66.667 %
1993	90.82	35	68.627 %
1985	90.33	36	70.588 %
2009	90.24	37	72.549 %
1966	89.73	38	74.510 %
2010	88.50	39	76.471 %
2003	87.69	40	78.431 %
1979	83.03	41	80.392 %
2004	82.96	42	82.353 %
2005	81.35	43	84.314 %
1987	78.64	44	86.275 %



Water Supply Forecast: ESP Comparison



COLUMBIA - GRAND COULEE DAM (GCDW1) Forecasts for WY 2010

Official Forecast (Regression) <i>Issued: 2010-01-08</i>								ESP Forecasts <i>Issued: 2010-01-11</i>						
(Description)														
Period	Forecast (KAF)	% of Average	5% Forecast	95% Forecast	30yr (1971-2000) Average	Max of Record	Min of Record	Forecast Period	ESP Forecasts for Forecast Period (KAF)					Obs Flow From Start of Period To 1/11/2010
									90 % Exceedance Probability	70 % Exceedance Probability	50 % Exceedance Probability	30 % Exceedance Probability	10 % Exceedance Probability	
JAN-SEP	65400.0	90	83555.0	47245.0	73040.0	103500.0	44000.0	JAN-SEP	55599.6	58240.2	60723.7	64924.0	71008.8	537.0
APR-JUL	48200.0	90	66355.0	30045.0	53850.0	76239.0	31885.0	APR-JUL	41071.0	43144.8	44783.1	48291.2	54022.0	0.0
APR-SEP	57300.0	90	75455.0	39145.0	63990.0	88512.0	39829.0	APR-SEP	49800.5	51648.3	54396.4	57943.4	63324.7	0.0
JAN-JUL	56300.0	90	74455.0	38145.0	62900.0	91140.0	34760.0	JAN-JUL	47331.6	49341.6	51283.7	55083.0	60620.2	537.0
APR-AUG	54000.0	90	72155.0	35845.0	60290.0	84080.0	37442.0	APR-AUG	46287.9	48426.0	51159.2	54002.8	59871.1	0.0

SNAKE - LOWER GRANITE DAM (LGDW1) Forecasts for WY 2010

Official Forecast (Regression) <i>Issued: 2010-01-08</i>								ESP Forecasts <i>Issued: 2010-01-11</i>						
(Description)														
Period	Forecast (KAF)	% of Average	5% Forecast	95% Forecast	30yr (1971-2000) Average	Max of Record	Min of Record	Forecast Period	ESP Forecasts for Forecast Period (KAF)					Obs Flow From Start of Period To 1/11/2010
									90 % Exceedance Probability	70 % Exceedance Probability	50 % Exceedance Probability	30 % Exceedance Probability	10 % Exceedance Probability	
JAN-SEP	24300.0	75	35172.0	13428.0	32610.0	53055.0	14754.0	JAN-SEP	21685.2	24926.5	26855.0	29072.7	32169.2	485.0
APR-JUL	16100.0	75	26972.0	5228.0	21550.0	33528.0	8634.0	APR-JUL	13220.3	16062.8	17561.1	19025.3	21123.7	0.0
APR-SEP	18000.0	75	28872.0	7128.0	24140.0	37104.0	10420.0	APR-SEP	15800.8	18748.4	20310.3	21808.2	24179.8	0.0
JAN-JUL	22400.0	75	33272.0	11528.0	30020.0	49478.0	12878.0	JAN-JUL	19103.0	22304.0	23963.8	26322.5	29197.1	485.0
APR-AUG	17000.0	74	27872.0	6128.0	22870.0	35290.0		APR-AUG	14494.1	17435.0	18904.4	20475.8	22664.7	0.0

COLUMBIA - THE DALLES DAM (TDAO3) Forecasts for WY 2010

Official Forecast (Regression) <i>Issued: 2010-01-08</i>								ESP Forecasts <i>Issued: 2010-01-11</i>						
(Description)														
Period	Forecast (KAF)	% of Average	5% Forecast	95% Forecast	30yr (1971-2000) Average	Max of Record	Min of Record	Forecast Period	ESP Forecasts for Forecast Period (KAF)					Obs Flow From Start of Period To 1/11/2010
									90 % Exceedance Probability	70 % Exceedance Probability	50 % Exceedance Probability	30 % Exceedance Probability	10 % Exceedance Probability	
JAN-SEP	100000.0	82	129763.0	70237.0	121300.0	176593.0	64517.0	JAN-SEP	91318.7	97564.5	101589.3	106835.6	117761.5	1525.0
APR-AUG	76700.0	82	106463.0	46937.0	93090.0	133733.0	49445.0	APR-AUG	68867.7	75637.0	78246.5	83438.3	90313.6	0.0
JAN-AUG	95400.0	82	125163.0	65637.0	115700.0	168669.0	59871.0	JAN-AUG	86656.8	90826.4	96129.6	101207.0	112159.2	1525.0
APR-SEP	81300.0	82	111063.0	51537.0	98650.0	141056.0	54091.0	APR-SEP	74581.9	80894.6	83804.5	89716.2	95766.5	0.0
JAN-JUL	88500.0	82	118263.0	58737.0	107300.0	159000.0	53359.0	JAN-JUL	79431.4	83779.5	88213.0	93397.9	103683.9	1525.0
APR-JUL	69800.0	82	99563.0	40037.0	84650.0	123463.0	42933.0	APR-JUL	62366.3	68278.5	70616.7	74705.1	82013.7	0.0



NWRFC Water Supply Webpage

www.nwrfc.noaa.gov



National Weather Service Northwest River Forecast Center

[Home](#)
[Site Map](#)
[News](#)
[Organization](#)

Water Supply Forecast (Issued 12-31-2009)

Map data updated 12/31.20:17 GMT, 12/31 12:17 PST.

The next LIVE Water Supply Briefing will be held January 11, 2010 – [click here for more information](#)

Place cursor over point for Station Info, click point for data plot.
Select Zoom Option to zoom in on map
Click to: [Select](#) Zoom Zoom to: [1x](#) [4x](#) [8x](#)

Legend

Water Supply Forecast (% Avg)

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

Point Info/Search

Station Name

ID

Forecast Period

Volume Forecast (KAF)

% of Avg (1971-2000)

5% Forecast (KAF)

95% Forecast (KAF)

30-YR Avg (KAF)

Water Supply Forecast

Information

Summary

Western Water Supply

ESP Water Supply

ESP Natural

ESP Interactive

Peakflow

Description

Verification

Inputs

Precipitation

Temperature

Snow

Runoff

Descriptive Information

Summary

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COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

January 20, 2010 Meeting

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 for January 6, 2010

There were no comments or changes to either the facilitator's notes or the official meeting minutes and both sets are considered final.

Water Supply Forecasts

Steve King, River Forecast Center, referred TMT to a power point presentation posted as a link to the agenda. He noted that the January Final forecast was issued on 1/8/10 and provided detailed data regarding the last few months of 2009 and the 2010 forecast.

Highlights of King's presentation included the following:

- Observed Runoff Conditions: currently, runoff is on the dry side with the exception of the Northern Cascades. Many eastern rivers have experienced frozen flows and/or gages this winter. Low flows noted for smaller streams.
- Observed Precipitation: November and December reports are 70-90% for much of the Columbia Basin; typical perhaps due to the current El Nino episode. Looking ahead, El Nino conditions are expected to continue through spring 2010. King showed that the CPC precipitation outlook for the region hints at lower than normal precipitation.
- Observed Monthly Temperatures: October and December were noted as cool with temperatures a bit warmer in November. King said the CPC temperature outlook indicates an above normal chance for warmer temperatures.
- Snow Pack: levels are below average across the board below the US/ CA border, with heavier snowpace in the upper Columbia in northern British Columbia. (Current conditions were compared to 30 years worth of data.) Upper Columbia and Snake River snow conditions are below normal. Lower Columbia Snow Conditions are below normal to normal, but King noted that the data was harder to generalize for the Lower Columbia which comprises a larger area with greater geographic variability.
- King reviewed Water Supply Forecast for the following areas: Upper Columbia River, Snake River and the Lower Columbia River. He noted that the forecast for Libby has trended upward since the early bird forecast was issued and that the forecast for Hungry horse has trended downward.
- The ESP forecasts on the Snake River were a little lower than those for the Columbia River projects, with 83% for Dworshak.

- TMT members helped clarify that the latest WSF for Libby is 88%, but that the ESP remains 77%.

Action/Next Steps: The February Final Forecast is due to be out 2/5/10; a live briefing is scheduled for 2/8/10. Folks can join the live briefings by signing up on the RFC webpage posted as a link off the TMT homepage.

Draft 2010 Fish Passage Plan Update

Steve Barton, COE, reminded TMT that change forms may be submitted until January 29th and the FPP will be discussed at the February 4th FPOM meeting.

Albeni Falls Update

Steve Barton, COE, noted that the winter flexibility operation will not occur in 2010. The operation will be considered in the future, pending review of the comments gathered to date.

Operations Review

Reservoirs: Libby was at elevation 2409.6', with inflows of 3.5 kcfs and outflows of 4 kcfs. Albeni Falls was at elevation 2051.6', passing inflows of 15 kcfs. Dworshak was at elevation of 1513.98' with inflows of 2.3 kcfs and outflows of 1.6 kcfs. Lower Granite average flows were 25 kcfs, McNary average flows were 90 kcfs (99 kcfs for the seven day average), and Bonneville average flows were 120 kcfs (113 the last few days). Grand Coulee was at elevation 1287.3' and Hungry Horse was at 3532.9' with outflows of 2.5 kcfs.

Fish: Paul Wagner, NOAA, shared there is nothing to report but did ask when the Fall Chinook forecast can be expected. Cindy LeFleur answered that numbers for the Columbia River will be out on February 17th.

Russ Kiefer, ID, noted that FPAC discussed chum at the 1/19 meeting. Grey Island and St. Cloud data showed a general pattern of adult returns over the last five years was down, but similar to other populations, specifically 2001. He noted that mortality is low in spite of research sampling.

Power System: Tony Norris, BPA, noted there is nothing to report.

Water Quality: Scott English, COE, advised TMT of dive operations at Bonneville January 20-21st. The tailwater elevation will be maintained at 11.5', with a potential for some spill if needed to support that elevation.

TMT Schedule: The next TMT meeting will be: **face-to-face on 2/3/2010 at 9:00am at NOAA's St. Helens Room on the 10th Floor. Sign-in on 11th Floor.**

Agenda items will include:

- Notes Review
- The Dalles Spillwall Update
- Maintenance/ Outages Updates for 2010
- Water Management Plan Spring/ Summer Update

- FOP Update
- Operations Review

**Columbia River Regional Forum
Technical Management Team Meeting
January 20, 2010**

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting), with representatives of COE, BOR, USFWS, Oregon, NOAA, Montana, BPA, Idaho, Washington, CRITFC and others participating. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at the meeting. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for January 6, 2009

There were no changes to either the facilitator's notes or the official meeting notes for January 6, so both were deemed final.

3. Update on Water Supply Forecasts

Steve King, River Forecast Center, referred TMT to a power point presentation posted as a link to the agenda. He noted that the January Final forecast was issued on 1/8/10 and provided detailed data regarding the last few months of 2009 and the 2010 forecast. Highlights of King's presentation included the following:

- Observed Runoff Conditions: currently runoff is on the dry side with the exception of the Northern Cascades. Many eastern rivers have experienced frozen flows and/or gages this winter. Low flows noted for smaller streams.
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- Observed Monthly Temperatures: October and December were noted as cool with temperatures a bit warmer in November. King said the CPC temperature outlook indicates an above normal chance for warmer temperatures.
- Snow Pack: levels are below average across the board below the US/ CA border, with heavier snowpace in the upper Colubia in northern British Columbia. (Current conditions were compared to 30 years worth of data.) Upper Columbia and Snake River snow conditions are below normal. Lower Columbia Snow Conditions are below normal to normal, but King noted that the data was harder to generalize for the Lower Columbia which comprises a larger area with greater geographic variability.

- King reviewed Water Supply Forecast for the following areas: Upper Columbia River, Snake River and the Lower Columbia River. He noted that the forecast for Libby has trended upward since the early bird forecast was issued and that the forecast for Hungry horse has trended downward.
- The ESP forecast on the Snake River were a little lower than those for the Columbia River projects, with 83% for Dworshak.
- TMT members helped clarify that the latest WSF for Libby is 88%, but that the ESP remains 77%.

Action/Next Steps: The February Final Forecast is due to be out 2/5/10; a live briefing is scheduled for 2/8/10. Folks can join the live briefings by signing up on the RFC webpage posted as a link off the TMT homepage.

4. Draft 2010 Fish Passage Plan

The majority of change forms submitted to date have been resolved at FPOM, Barton reported. The COE requested that any outstanding change forms be submitted by January 29 so they can be discussed at the next FPOM meeting February 4. The next step will be incorporating changes into the draft 2010 FPP.

5. Albeni Falls Update

The proposed operation to draft Albeni Falls during cold snaps for energy production, varying the elevation of Lake Pend Oreille up to half a foot per day, has been deferred and won't occur in 2010, Barton said. This decision does not preclude possible consideration of the operation after further review of information gathered during the public process.

6. Operations Review

a. Reservoirs. Libby is at elevation 2,409.6 feet, with inflows of 3-3.5 kcfs and outflows steady at the 4.0 kcfs minimum. Albeni Falls is at elevation 2,051.6 feet, passing inflows of 15 kcfs. Dworshak is at elevation 1,513.98 feet, with inflows of 2.3 kcfs and discharges of 1.6 kcfs.

Grand Coulee is at elevation 1,287.3 feet. Hungry Horse is at elevation 3,532.9 feet, with discharges of 2.5 kcfs.

Daily inflow averages are steadily around 25 kcfs at Lower Granite. The 7-day average at McNary is 99 kcfs, and 120 kcfs at Bonneville.

Scott Bettin (BPA) asked about greasing of spillway gates at Bonneville. That's tentatively scheduled for April 1, after construction of The Dalles spillwall is complete and before spill season begins, Barton said. There's a line outage scheduled at Bonneville for April 25.

b. Fish. There are no fish in the system now, Wagner reported. Yesterday FPAC discussed the chum operation and noted that the general pattern of adult

returns for the past 5 years was similarly low across all populations. More studies are warranted, particularly to address concerns about the long-term impacts of tagging on fish survival.

On February 17, the Washington Department of Fish and Wildlife will forecast the size of the fall Chinook run on the Columbia in 2010.

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

d. Water Quality. There are no significant water quality issues now, Scott English (COE) reported. On January 20-21, two fish units will be operating at Bonneville Dam for dive operations, causing spill of approximately 25 kcfs to maintain the 11.5-foot minimum tailwater elevation for chum. No more than 1.5-2% change in TDG levels is expected as a result of this work. Warrandale gage readings are currently around 101% TDG.

9. Next Meeting

The next regularly scheduled TMT meeting will be February 3 at NOAA's office in Portland. An update on The Dalles spillwall construction, review of facilities maintenance and planned outages, the spring/summer Water Management Plan, and possibly an update on the BiOp court case are on the agenda. This summary prepared by consultant and writer Pat Vivian.

Name	Affiliation
Steve Barton	COE
John Roache	BOR
Dave Wills	USFWS
Rick Kruger	Oregon
Paul Wagner	NOAA
Doug Baus	COE
Jim Litchfield	Montana
Tony Norris	BPA
Russ Kiefer	Idaho
Scott English	COE
Laura Hamilton	COE
Kim Johnson	COE
Scott Bettin	BPA
Russ George	WMC
Rob Diaz	Integral Renewables
Greg Bowers	COE
Karl Kanbergs	COE
Steve Hall	COE Walla Walla
Steve King	RFC

Phone:

Cindy LeFleur	Washington
Kyle Dittmer	CRITFC

Joel Fenolio
Shane Scott
Tim Heizenrader
John Hart
Holli Krebs
Barry Espenson
Rob Allerman
Tom Le

COE Seattle
PPC
Centaurus
EWEB
JP Morgan
CBB
Deutsch Bank
Puget Sound Energy

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday February 3, 2010 09:00 - 12:00

NOAA Fisheries
1201 N.E. Lloyd Blvd., Suite 1100
Portland, Oregon 97232-1274
Map Quest [\[Directions\]](#)

Mt. St. Helens Room, 10th Floor Conference Room

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for January 20, 2010 [\[Meeting Minutes\]](#)
3. The Dalles Spillwall Project - Pat Duyck, COE-NWP
4. Planning for 2010 Spring Operations - Steve Barton, COE-RCC
5. Water Management Plan Spring/Summer Update - Steve Barton, COE-RCC
6. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System
 - d. Water Quality
7. Other
 - a. Set agenda and date for next meeting - **February 17, 2010**
 - b. [\[Calendar 2010\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or*

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

February 3, 2010 Meeting

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 for January 20, 2010

Doug Baus, COE, noted that edits to Steve King's presentation were made to both the facilitator's notes and the official meeting minutes. The correct versions have been posted to the web. There were no other comments or changes to either the facilitator's notes or the official meeting minutes and both sets are considered final.

The Dalles Spillwall Project

Pat Duyck, COE, updated TMT members on the project's progress explaining that the recent executive partnering meeting with the contractor identified the work as being ahead of schedule, as opposed to this time last year. He reported that all pre-cast blocks have been placed and that anchor installation (118 total) is to be completed this week. 80-85 are fully stressed at this point. Duyck said that they have replaced slabs though number 11 (of 15), with 200' remaining. The bulk of the heavy work is expected to be completed at the end of February, with finish and cleanup work expected to be done by mid-March and pool restriction lifted at that time. Duyck also noted that he was confident that biological testing will meet the BiOp standard and that avian predation will continue to be monitored. He added that calculations for the project assumed a mixed zone for TDG and the COE is working with Mike Schneider as they draft their management plan for any potential TDG issues that may arise.

Action/Next Steps: Duyck will report back to TMT as appropriate. This item may be on the agenda for the next TMT meeting on 2/17. TMT members may have the opportunity to visit the project at a future date.

Planning for 2010 Spring Operations

Steve Barton, COE, noted that the February early bird forecasting is pointing toward a dry spring with general reduction in volume across the board. He detailed the following projects: Grand Coulee is at 79-80% of normal, The Dalles 72%, Libby 75%, Lower Granite 61% and Dworshak at 64% of normal. An updated COE forecast will be released on Friday, 2/5.

Kyle Dittmer, CRITFIC, presented forecast data from the Australian Bureau of Meteorology and NOAA, which (per the Southern Oscillation Index [SOI] shows El Nino continuing through spring. Consequently, the water supply is expected to decrease.

Barton continued on to discuss spring operations. There are two upcoming operations at Bonneville: one scheduled for April 2³rd, when a low pool operation will be required for greasing of the dogging slots at all spillways. The second is line outage maintenance at Bonneville transmission on April 10th for up to 10 hours from 7:30-1700. The operation requires that units numbered 11-18 and fish units 1 and 2 be out. The operation will require forebay flexibility and is not expected to conflict with the spring fish passage season.

Action/Next Steps: This item will be on the agenda for the 2/17 TMT meeting.

Water Management Plan Spring/Summer Update

Steve Barton, COE, noted that there is no update at this time as he is waiting on some clarity from the COE.

Action/Next Steps: This item will be on the agenda for the 2/17 TMT meeting.

Operations Review

Reservoirs: Libby was at elevation 2408.35', with inflows of 2.4 kcfs and outflows of 4 kcfs. Albeni Falls was at elevation 2051.48', passing inflows of 13.1 kcfs. Dworshak was at elevation of 1514.67' with inflows of 1.6 kcfs and outflows of 1.2 kcfs.

Other: Paul Wagner, NOAA, asked why outflows were reduced from 1.6 to 1.2 kcfs. Steve Hall, COE, explained that Unit 1 is operating efficiently at 1.2 and that discharge was reduced in order to refill as much as possible in preparation for Spring operations. He noted 106-108 TDG levels downstream, which is still 2% below the state limit. He also shared that a preliminary forecast is showing 63% of normal.

McNary average flows were 100 kcfs and Bonneville average flows were 105-110 kcfs. Grand Coulee was at elevation 1285.4'. Hungry Horse was at 3530.07' with outflows of 2.7 kcfs. BPA noted that Grand Coulee was operating very conservatively, staying close to chum minimums and preserving water for Spring Operations.

Fish: Paul Wagner, NOAA, shared they are tracking the chum emergence time frame. He noted warmer than average river temperatures were observed upstream in the Hanford Reach. He also speculated that the lower river flow that has occurred thus far this year may have allowed more ground water inflow to the rearing area, possibly resulting in higher incubation temperatures in the chum spawning area.

Power System: Tony Norris, BPA, noted that there is nothing to report but did share that installed wind turbine capacity is at 2800 mega watts. He reviewed an online wind generation graph that tracked production since 1998. The graph showed a sharp increase in capacity since October 2008.

Water Quality: Scott English, COE, noted that there are no issues to report but did share that the COE is working with the COE's Product Delivery Team and Pat Duyck to study and test the effects of The Dalles Spill Wall Project on TDG levels.

TMT Schedule: The next TMT meeting will be: **face-to-face on 2/17/2010 at 9:00am at the regular COE conference room.**

Agenda items will include:

- Notes Review
- The Dalles Spillwall Update- TBD
- 2010 Operations- Updated weather and flood control forecasts
- Water Management Plan Spring/ Summer Update
- FOP Update
- Operations Review

**Columbia River Regional Forum
Technical Management Team Meeting
February 3, 2010**

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting) with representatives of USFWS, NOAA, BPA, COE, CRITFC, BOR, Idaho, Oregon, Washington and others participating. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at the meeting. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for January 20, 2010

Steve King (RFC) edited the coverage of his presentation on weather forecasting on January 20, Doug Baus (COE) said. The revised version is posted to the TMT web page in both the facilitator's notes and official notes. There were no additional comments on meeting notes today.

3. The Dalles Spill Wall Project and Related Maintenance

Pat Duyck, COE project manager of The Dalles spill wall construction, gave a progress report as well as a glimpse of work ahead for the lower Columbia River projects.

Spill wall construction is proceeding ahead of schedule, having come a long way since last year's crane failure. The precast blocks are in place, and all 118 anchors will be installed by next week. The contractor is working now on the last 200 feet of the wall. Heavy construction is expected to wrap up by the end of February, with clean-up and all remaining in-water work completed before the end of March, almost a month ahead of schedule. The COE will probably lift the restriction on Bonneville forebay to facilitate spill wall construction by mid March. Demobilization of the construction site should be complete by March 15.

Greasing of the spill gates at Bonneville needs to occur between the end of spill wall construction and before spill season starts, Scott Bettin (BPA) noted. The Dalles operation should be able to accommodate the spill gate maintenance by the end of March or early April, Duyck replied. Spill gate maintenance is tentatively scheduled for April 2-3. It ties into another issue, the Bonneville 2nd powerhouse unit outage, discussed further today under agenda item 4 below.

When spill wall construction is complete, the COE plans to conduct biological testing to confirm that the project now meets BiOp performance standards. If not, the COE is prepared to pursue additional forebay or spillway improvements.

Two other future areas of investigation are avian predation and TDG impacts of the spill wall. Installation of a major avian array in the John Day tailrace raises concerns about whether the birds will move downstream to The Dalles tailrace. The COE plans to monitor avian predation throughout 2010, with a goal of constructing a similar avian array there. Plans are also underway to verify that the new spill wall doesn't generate unacceptable levels of total dissolved gas. The most challenging area with regard to TDG management will be the mixing zone where spill crosses powerhouse outflows. Previous modeling of the smaller wall in bays 6 and 7 assumed that flows in the area will be mixed. The COE needs to verify that in order to predict TDG levels accurately using existing models. It appears that gas will be a problem with flows above 120 kcfs, but it's hard to test that assumption until the wall is complete. The COE's reservoir control center is taking the lead responsibility on this work, Duyck said. Mike Schneider (COE), a regional expert in gas management, is involved. The COE will keep TMT updated on avian predation and TDG management at The Dalles.

Halton offered to coordinate plans for a TMT field trip to observe the new wall in action sometime after spill season starts April 10.

4. Planning for 2010 Spring Operations

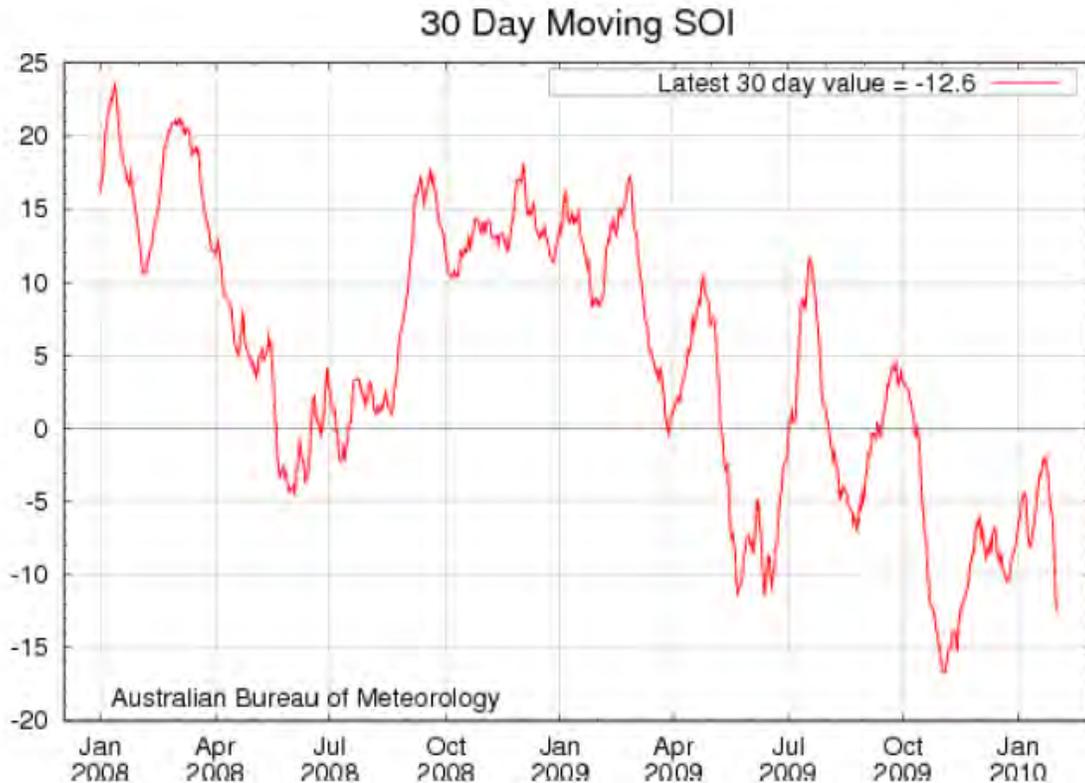
Snowpack this year looks to be even lower than previously predicted, raising serious concerns about the dwindling regional water supply. Barton gave TMT the latest data from February RFC early bird forecasts:

- Grand Coulee – 70-80% of normal for most of fish passage season
- The Dalles – 70% of normal, or 77.1 MAF for January-July
- Libby – 75% of normal
- Lower Granite – 61% of normal for April-July
- Dworshak – 64% of normal for April-July
- Canada weather stations – 79-80% of normal

Another RFC forecast will be available on February 5, and the COE forecast for Dworshak and Libby should be available soon after that. The next TMT meeting on February 17 will be the right time for detailed discussion of flood control draft targets and seasonal flow objectives for this year, Barton said.

The Australian Bureau of Meteorology, which monitors the Southern Oscillation Index of temperatures in the Pacific Ocean frequently, also predicts bad news, Kyle Dittmer (CRITFC) reported. The SOI, previously hovering around neutral, has gone negative which is predictive of the drier, warmer weather associated with El Nino. Barton asked whether temperatures off the west coast are following that trend, per a comment Dittmer made at TMT recently. The Pacific Marine Environmental Laboratory in San Diego reports that Pacific water have warmed up, Dittmer replied. It remains to be seen how this trend will affect upwelling, which is critical to salmon survival. We can expect the water forecast

to deteriorate further and should operate the system conservatively to store as much water as possible by April 10, Dittmer advised.



Discussion then moved to scheduling of upcoming work at Bonneville. The 2nd powerhouse line outage is scheduled for April 10 from 7:30 am to 5 pm. All other system outages are scheduled around that date until the actual date of spill wall completion is known. The outage will require units 11-18 in the powerhouse 2 to go to zero generation along with fish units 1 and 2. It also will require forebay flexibility, which means that spill wall construction must be finished first. The switch to using powerhouse 1 for 10 hours on April 10 is expected to have no measurable effect on the system's ability to meet spring spill targets, Barton said.

Greasing of the dogging slots in the Bonneville spill gates will require a low pool operation scheduled for April 2-3. This essential maintenance has been postponed several times and needs to be done before 2010 spill season starts. The COE is looking for ways to get the 2nd powerhouse maintenance done outside of fish passage season if possible. Rick Kruger (Oregon) asked what constraints keep that from happening. The line can't be taken out of service earlier without disrupting station service at the other Columbia projects, Barton replied. The purpose of the line outage, Bettin explained, is to put safety precautions into place to prevent a line failure. Kruger asked whether flows would be stored in the river for this operation. Local storage should be sufficient at Bonneville, Barton replied. There was agreement that routing flows through the

1st powerhouse has some fish management implications. TMT will discuss these plans further at its next meeting February 17.

5. Water Management Plan – Spring/Summer 2010 Update

There was nothing to report today. The COE is waiting for more definitive information on water conditions this spring before developing a water management strategy for spring and summer passage season. TMT will revisit the WMP spring/summer update at its next meeting.

6. Operations Review

a. Reservoirs. In response to a request from Dave Wills (USFWS), the COE will provide current flood control elevations for each project at future TMT meetings as part of the regular operations review. Flood control elevations are posted at the TMT site at <http://www.nwd-wc.usace.army.mil/report/colsum/>.

Libby is at elevation 2,408.35 feet, with inflows of 2.4 kcfs and outflows at the 4.0 kcfs minimum. The end of February flood control elevation is 2,429.2, John Roache (BOR) reported. Albeni Falls is at elevation 2,051.48 feet, passing inflows of 13.1 kcfs.

Dworshak is at elevation 1,514.67 feet, with inflows of 1.6 kcfs and discharges of 1.2 kcfs. Because inflow predictions are so low, and Dworshak reservoir is about 30 feet below flood control elevation now, the COE reopened an earlier inquiry and found a way to make Dworshak unit 1 function smoothly at a flow of 1.1 kcfs instead of the current 1.6 kcfs minimum. An additional 100 cfs is being released for the fish hatcheries, for a total discharge of 1.2 kcfs. At this point the potential reduction applies to unit 1 only, Steve Hall (COE) said. The goal is to minimize discharge and maximize potential for refilling the reservoir. The current COE Dworshak forecast – unofficial at this point – is 63% of normal.

Grand Coulee is at elevation 1,285.4 feet, operating conservatively to maintain chum flows while preserving as much water as possible. Hungry Horse is at elevation 3,530.07 feet, with discharges of 2.7 kcfs to meet the Columbia Falls minimum.

There was no report today on inflows at Lower Granite. The 7-day average inflow at McNary is 100 kcfs. Bonneville is passing inflows of 105-110 kcfs as needed to maintain the minimum tailwater elevation of 11.5 feet for chum.

b. Fish. It's the time of year to track chum emergence timing closely, Wagner said. It could be an important factor this year if the system is to meet all BiOp objectives. Ending chum protection flows would be a useful tool to conserve water for spring spill, Tony Norris (BPA) noted.

c. Power System. The Bonneville balancing authority area now has 2,800 aMW of installed wind turbine capacity. Actual power production has been

very low as the wind hasn't been blowing. Wind capacity can be tracked via the TMT web page at <http://www.transmission.bpa.gov/Business/Operations/Wind/>.

d. Water Quality. Scott English (COE-RCC) will work with Pat Duyck to give TMT future updates on water quality at The Dalles spill wall.

9. Next Meeting

The next regularly scheduled TMT meeting will be February 17. Potential agenda items include an update on The Dalles spill wall construction (including biological testing); the plan for spring 2010 operations (including flood control updates); a WMP spring/summer update; and a status report on the Fish Operations Plan spring/summer update. This summary prepared by technical writer Pat Vivian.

<i>Name</i>	<i>Affiliation</i>
Dave Wills	USFWS
Paul Wagner	NOAA
Tony Norris	BPA
Steve Barton	COE
Tim Heizenrader	Centaurus
Holli Krebs	JP Morgan
Doug Baus	COE
Pat Duyck	COE
Russ George	WMC
Scott Bettin	BPA
Rick Kruger	Oregon

Phone:

John Roache	BOR
Laura Hamilton	COE
Russ Kiefer	Idaho
Kim Johnson	COE
Karl Kanbergs	COE
Scott English	COE
Shane Scott	PPC
Cindy LeFleur	Washington
Tom Le	Puget Sound Energy
Ruth Burris	PGE
Rob Allerman	Deutsch Bank
Steve Hall	COE Walla Walla

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 **MT** : Jim Litchfield / Brian Marotz
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday February 17, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

To check into the building, take the elevator to the 5th floor and the guard will issue you an ID badge if you need one and will take you down to the meeting room on the 4th floor. If you have NOT attended a TMT meeting in the past contact Steve Barton (503) 808-3945 so you can be added to the TMT Visitor List and issued an ID badge. This badge may be used indefinitely. If you have attended TMT in the past you may re-use your ID badge indefinitely. If you are a federal employee you will also need to have an ID badge issued to you which can be used indefinitely.

**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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for February 3, 2010 [\[Meeting Minutes\]](#)
3. The Dalles Spillwall Update - Steve Barton, COE-RCC
4. 2010 Operations/Updated Weather and Flood Control Forecasts - Steve Barton, COE-RCC
 - a. [Westwide SNOTEL](#)
5. Water Management Plan Spring/Summer Update - Steve Barton, COE-RCC
6. FOP Update - Steve Barton, COE-RCC
7. Operations Review
 - a. Reservoirs
 - i. [Libby Water Year 2010](#)
 - b. Fish
 - c. Power System
 - d. Water Quality

8. RIOG Briefing - *Katherine Cheney, NOAA Fisheries*
 - a. [2010 Hydro Dispute Resolution Procedures](#)
 - b. [2010 Hydro Procedures Q&A](#)
 - c. [RIOG Briefing](#)
 - d. [RIOG Assignment](#)
 - e. [FCRPS Point of Contact](#)
9. NOAA Transport Studies - *Bill Muir, NOAA Fisheries*
 - a. [Summary](#)
 - b. [Power Point](#)
10. Other
 - a. Set agenda and date for next meeting - **March 3, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

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

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

2010 Hydro Dispute Resolution Procedures

February 2010

Background

The Regional Implementation Oversight Group (RIOG) has been established to provide a high-level policy forum for discussion and coordination of the implementation of the 2008 FCRPS BiOp and related BiOps. The overall purpose of the group is to inform the federal, state and tribal agencies that are actively engaged in salmon recovery efforts regarding implementation issues from each sovereign's perspective. Teams are expected to operate within FCRPS BiOp parameters with a primary mission to achieve BiOp Performance Standards. There is also an expectation that issues be resolved at the technical level as often as possible (e.g. elevation of disagreement is to be reserved for significant issues).

Relationship between RIOG and Hydro Technical Teams

For FCRPS hydro system implementation issues, the RIOG Senior Policy Group (RIOG) is supported by a Senior Hydro Technical Team (Senior Hydro Team), which in turn is supported by the Technical management Team (TMT), the System Configurations Team (SCT), and other technical teams. (see RIOG Guidelines)

2010 Hydro Dispute Resolution Procedures

On January 19, 2010, the RIOG approved the following hydro dispute resolution procedures on a trial basis. The goal of these procedures is to provide an efficient and timely process to address in-season management and other potential disputes.

When policy guidance is needed or if there is a dispute, the technical team will discuss the issue and identify or narrow the specific issue or question in dispute. If a team is unable to reach resolution, the Technical Team Chair may poll the sovereigns for their views and input.

In the case of a short-term dispute (e.g. where a decision is required within 2 weeks), the responsible federal agency will make a decision after considering the views and input of the technical team. The federal agency with the authority to make the decision will notify the RIOG and technical team members about its decision and rationale in a timely manner.

If a technical team member contests the federal decision, he/she should confer with their RIOG Senior Policy Team representative. The RIOG representative may further raise the issue to the Senior Hydro Team Chair for further consideration. If further discussion is warranted, the Senior Hydro Team Chair will convene the team to prepare

2010 Hydro Dispute Resolution Procedures

February 2010

a RIOG Policy Briefing Paper, with the assistance of technical team members. The RIOG may have a conference call to further address the dispute in a timely matter.

In the case of a longer-term dispute, the technical team chair should bring it to the attention of the Chair of the Senior Hydro Team. In communicating the issue to the Chair of the Senior Hydro Team, the notification should include the RIOG Chair and the RIOG Coordinator.

The Chair of the Senior Hydro Team will convene the Team to further discuss the issue and prepare a RIOG Briefing paper according to the RIOG template (see attached), with the assistance of technical team members. Team members may be asked to supply additional information during the process.

At times, technical team and RIOG meetings may include a polling of sovereign views on a given issue. Sovereign views will be made by designated representatives (or their alternates) registering consent, objection, or abstention to a decision made at a noticed meeting or conference call.

Each member organization is responsible for having a representative or alternate present at these meetings (in person or by conference call) to register consent, objection, or abstention on a decision. Every effort will be made to ensure that those members who feel strongly about an issue can be present at the meeting at which the issue will be discussed. Each sovereign is encouraged to provide coordination and communication between technical team and RIOG members.

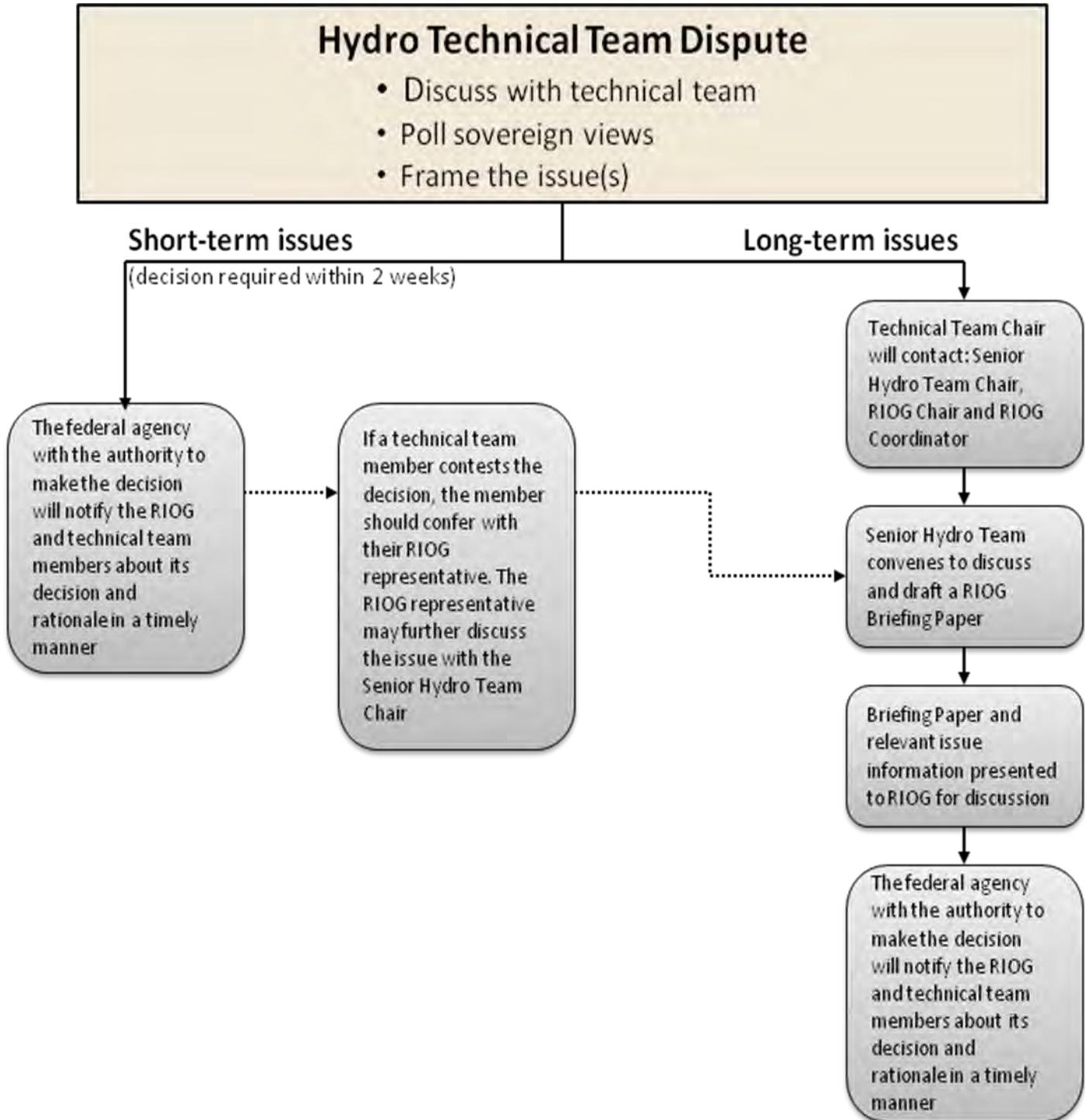
The RIOG may include an opportunity for public input into a policy issue or dispute. If so, timely notice and relevant materials will be made available to the public.

The federal agency with the authority to make the decision will notify the RIOG and technical team members about its decision and rationale in a timely manner. Agency decisions, RIOG comments and supporting materials will be posted on the RIOG website and maintained in the respective federal administrative records.

Based on recommendations or requests from the RIOG, policy issues and disputes may be further elevated to the Regional Executives, which include the federal administrative heads, Governors and Tribal Chairs.

2010 Hydro Dispute Resolution Procedures

February 2010



2010 Hydro Dispute Resolution Procedures

February 2010

2010 Key contacts

<i>Role</i>	<i>Name</i>	<i>Email</i>	<i>Phone</i>
RIOG Chair	Bruce Suzumoto	Bruce.Suzumoto@noaa.gov	503-230-5417
RIOG Coordinator	Katherine Cheney	Katherine.Cheney@noaa.gov	503-231-6730
Senior Hydro Technical team Chair	Ritchie Graves	Ritchie.Graves@noaa.gov	503-231-6891
SCT Chair	Bill Hevlin	Bill.Hevlin@noaa.gov	503-230-5415
TMT Chair	Steve Barton	Steven.B.Barton@usace.army.mil	503-808-3945

2010 Hydro Dispute Resolution Procedures Questions and Answers

February 2010

What is RIOG's regional decision-making role and how are those decisions made? How do/should the two decision-making processes intersect?

The Regional Implementation Oversight Group (RIOG) has been established to provide a high-level policy forum for discussion and coordination of the implementation of the 2008 FCRPS BiOp and related BiOps. The overall purpose of the group is to inform the federal, state and tribal agencies that are actively engaged in salmon recovery efforts regarding implementation issues from each sovereign's perspective.

The role of the hydro technical teams is to focus on achievement of hydro performance standards and metrics as described in the FCRPS BiOp.

The RIOG is a forum for interagency coordination and does not supplant existing federal, state or tribal decision making authorities. All decisions under the authority of the federal government will continue to be made by the appropriate federal agency with the statutory authority to make such decisions.

RIOG meetings may include a polling of sovereign views on a given issue. Sovereign views will be made by designated representatives (or their alternates) registering consent, objection, or abstention to a decision made at a noticed meeting or conference call.

The RIOG may include an opportunity for public input into a policy issue or dispute. If so, timely notice and relevant materials will be made available to the public.

The federal agency with the authority to make the decision will notify the RIOG and technical team members about its decision and rationale in a timely manner. Agency decisions, RIOG comments and supporting materials will be posted on the RIOG website and maintained in the respective federal administrative records.

Policy issues and disputes may be further elevated to the Regional Executives, which include the federal administrative heads, Governors and Tribal Chairs.

What is the expected role of the Senior Technical Hydro Team? What is the status/makeup of that group?

The expected role of the Senior Hydro Technical team (Senior Hydro team) involves long-term planning and adaptive management on overall 2008 FCRPS BiOp hydro operations. It operates at a broader scale and higher level than the hydro technical

2010 Hydro Dispute Resolution Procedures Questions and Answers

February 2010

teams such as TMT and SCT. Its primary focus is on achievement of hydro performance standards and metrics as described in the FCRPS BiOp. It will also cover predation management. If requested by the RIOG Senior Policy Team, the Senior Hydro Team may review technical issues from other hydro technical teams.

Examples of Senior Hydro Team activities include:

- Each fall, assess action agency implementation results in Progress Reports and discuss adaptive management issues going forward.
- Assignments from RIOG via assignment template
- Based on the cumulative Progress Reports, as requested, contributing to development of 2013 and 2016 diagnostics and adaptive management recommendations for the RIOG
- When policy guidance is needed or if there is a dispute within a Hydro Technical Team, on a trial basis for 2010, the Senior Hydro Team will convene the Team to further discuss the issue and prepare a Policy Briefing paper according to the RIOG template. See the 2010 Hydro Dispute Resolution Procedures and flowchart for specifics.

What is the membership structure of RIOG? How often does the RIOG meet? Will the RIOG meetings be open to the public at any point?

The RIOG is made up of sovereigns in the Columbia Basin. Each sovereign may assign one member and one alternative to the Senior Policy Team.

The RIOG may meet quarterly in person and have conference calls as issues are warranted.

RIOG meetings are not open to the public at this time.

If TMT is unable to resolve an issue that needs to be elevated for decision-making, where should that issue go? In which format should the topic be elevated?

When policy guidance is needed or if there is a dispute, the technical team will discuss the issue and identify or narrow the specific issue or question in dispute. If the team is unable to reach resolution, the Technical Team Chair may poll the sovereigns for their views and input.

2010 Hydro Dispute Resolution Procedures Questions and Answers

February 2010

In the case of a short-term dispute (e.g. where a decision is required within 2 weeks), the responsible federal agency will make a decision after considering the views and input of the technical team. The federal agency with the authority to make the decision will notify the technical team members about its decision and rationale in a timely manner. The federal agency will also share the information with the RIOG.

If a technical team member contests the federal decision, he/she should confer with their RIOG Senior Policy Team representative. The RIOG representative may then raise the issue to the Senior Hydro Team Chair for further consideration. If further discussion is warranted, the Senior Hydro Team Chair will convene the team to prepare a RIOG Policy Briefing Paper, with the assistance of technical team members.

In the case of a longer-term dispute, the technical team chair should bring it to the attention of the Chair of the Senior Hydro Team. In communicating the issue to the Chair of the Senior Hydro Team, the notification should include the RIOG Chair and the RIOG Coordinator.

The Chair of the Senior Hydro Team will convene the Team to further discuss the issue and prepare a RIOG Briefing paper according to the RIOG template (see attached), with the assistance of technical team members. Team members may be asked to supply additional information during the process.

Notifications may be provided by email and should include a draft of the issue in RIOG briefing paper form.

Key 2010 contacts:

RIOG Chair – Bruce Suzumoto

Senior Hydro Technical team Chair – Ritchie Graves

RIOG Coordinator – Katherine Cheney

Does RIOG envision a role for TMT in the adaptive management decision process? If so, what is that role?

For the most part TMT will continue to operate as it has in the past. (Changes would occur in how disputes are resolved once they are elevated from TMT.) TMT continues to provide valuable guidance for use of in-season flexibility that stays within the confines

2010 Hydro Dispute Resolution Procedures Questions and Answers

February 2010

of the 2008 FCRPS BiOp. This “in-season” guidance that occurs within existing BiOp operations flexibility is distinct from “adaptive management” as used in the BiOp¹.

Adaptive management discussions will take place on an annual basis, in the fall, following the Action Agencies Progress Reports. Technical team members are free to make constructive adaptive management observations to their respective Senior Hydro Team and RIOG representatives (based on however each entity decides to handle this process). It would then be the role of the RIOG member to decide which, or whether, this information is discussed with the Senior Policy Team.

The RIOG will play a significant role in the annual and comprehensive progress reviews of FCRPS BiOp implementation and in adaptive management based on those results. Annual progress reports will include suggestions for adaptive management for discussion amongst the RIOG Senior Technical Teams and Senior Policy Team in the fall. Adjustments to implementation actions will be captured in the subsequent implementation plans.

Should the Senior Hydro Team request technical information or analysis from the technical teams, they will make a request via the RIOG assignment template.

Would be good to have actual names and contact information for membership of RIOG and various components...or if specific membership is yet to be decided, etc.

See RIOG team spreadsheet for the latest membership information.

The Senior Hydro Team is just being formed.

¹ Please refer to Adaptive Management Implementation Plan for a clearer understanding of adaptive management.

**2010 Hydro Dispute Resolution Procedures
Questions and Answers**

February 2010

Need information on how meeting notices, background/support information, meeting minutes, decisions, etc. get disseminated. Direct email is good for reminders, etc., but a web site for access to this information is needed.

RIOG materials are posted on the RIOG website. Some of these materials are also available at technical team meetings or posted on salmonrecovery.gov. Please contact your RIOG representative or Katherine Cheney for more details.

RIOG Briefing Paper:

Technical TEAM NAME	
Statement of Issue: <i>in a Nutshell</i>	
Timeframe for Decision	
Species at Issue	
Status of Species	
Decision Options	
Relevant Scientific Information	
Other Considerations/ Impacts	
Views / Positions of Team Members & Brief Explanation	
Contacts	

RIOG Assignment to Technical Teams

Technical TEAM NAME	
Objectives: <i>Assignment in a Nutshell</i>	
Specific Deliverable	
Scope	
Primary Considerations	
Other Considerations	
Time Frame: <i>Deadline, Milestones, Resources</i>	
Contacts	

FCRPS Biological Opinion Implementation Points of Contact

Point of Contact	RIOG Policy Team	Habitat - Senior Tech Teams	Hydro - Senior Tech Teams	Hatchery - Senior Tech Teams	Predator Management	RME	TMT	SCT	Modeling	WQ
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**ANALYSES OF JUVENILE CHINOOK SALMON AND STEELHEAD
TRANSPORT FROM LOWER GRANITE AND LITTLE GOOSE DAMS,
1998-2008**

NOAA Fisheries
Northwest Fisheries Science Center
Fish Ecology Division

January 2010

Executive Summary

- The report provides analyses of patterns of smolt-to-adult return rates (SARs) relative to in-season migration timing of smolts. SARs of juvenile fish that were transported from either Lower Granite Dam (LGR) or Little Goose Dam (LGO) were compared to SARs of non-transport fish that migrated through the lower Snake and Columbia Rivers in the years 1998 – 2008.
- The measure used to assess the benefit of transport relative to downstream migration was the transport to migrant ratio (T:M), defined as the ratio of SAR for transported fish to that of non-transport migrants for corresponding groups. Statistical models produced estimated values for the SARs of the two groups and the T:M for each day was estimated from those estimates.
- To study seasonal SAR patterns required known dates of juvenile passage. Therefore, migrant groups were formed from PIT-tagged fish that were bypassed (i.e., detected) at the collector dams. The value of information from bypassed migrants has been discounted by some scientists in the region because bypassed fish generally have lower SARs than fish that pass the collector projects undetected via non-bypass routes (mostly over the spillway, with a small proportion through turbines). During periods of transport, migrants among the non-tagged run-at-large mostly pass via non-bypass routes (bypassed non-tagged fish are mostly transported), so extrapolation of results for bypassed migrants to the run at large could be biased (estimated T:M ratios greater than would have occurred for the run at large). The report addresses this potential bias by carefully considering standards for comparison of SARs and T:M (detailed below).
- Over the years, fish have been PIT tagged both upstream from LGR and at LGR. Tagging location was included as a potential factor in the models of SAR. In some cases where data were available from both tagging locations, SARs were not statistically different between tagging locations. In other cases, SARs differed significantly but relative SARs between transport and migrant fish (i.e., T:M ratio) were the same. In still others, both SARs and T:M differed depending on tagging location.
- The basic unit of data on which the analyses were based was the estimated SAR for a daily group of fish. Each LGR analysis included as many of the following four categories as were available: fish tagged upstream of LGR and transported from LGR; fish tagged upstream of LGR and detected and returned to river at LGR; fish tagged at LGR and transported from LGR; fish tagged at LGR and released in the tailrace of LGR. Each LGO analysis included only two groups, transported and in-river, as all fish were tagged upstream of LGO. Although analyses were based on SARs for daily groups, there was too much sampling variability in the daily points for effective visual display. Instead, our figures included estimated SARs for daily groups pooled into weekly

periods. Weekly points, with relatively less “noise,” effectively summarized the daily data and provided a clearer picture.

- A statistical regression method (Poisson log-linear regression) was used to fit a curve or a straight line to the daily SAR data points, and to assess the fit statistically. Potential factors to explain SARs were migration group (transported or in-river migrant), tagging location, and date of passage (day of year). Two- and three-way interactions among these factors were also considered. Information-theoretic (AIC-based) methods were used to identify a best-fitting model for each species and rearing-type combination in each year. As from any regression method, the resulting lines and curves represent a “smoothing” of the data points, in this case the estimated daily SARs, and the data points themselves were “scattered” around the smoothed line.
- Details of river environment (e.g., flow, spill, water temperature, number of fish migrating through dams, etc.) were not considered explicitly in this analysis (i.e., measures of these characteristics were not included as factors potentially affecting SAR or T:M).
- Daily T:M ratios estimated from the fitted SAR curves were assessed relative to two different “standards.” T:M greater than 1.0 indicated that among fish in the bypass system, those that were transported returned at a higher rate than those that were returned to the river. The second standard, designed for inference to the run at large, was based on a correction factor calculated to compensate for the bypass effect. These correction factors “raised the bar” to a standard higher than a T:M of 1.0. The estimated bypass effect varied by year and species, and the resulting alternative standards ranged from 1.02 – 1.04 for wild Chinook and 1.03 – 1.11 for wild steelhead at LGR and 1.08 – 1.22 for wild Chinook and 1.08 – 1.31 for wild steelhead at LGO. T:M greater than this alternative standard indicated that transported fish in the run at large returned at a higher rate than migrants in the run at large.
- Regression results for each species/rearing-type/year were illustrated with a set of figures: one small figure for each tagging location showing point estimates of SAR for weekly pooled groups, with standard errors, and the best-fit curves or lines from the regression for transport and migrant fish; and one large figure showing the curves for T:M through the season derived from best-fit SAR curves, along with 95% confidence “envelopes” around the curves. Appendix A includes 42 such sets of figures for transport from LGR. Appendix B includes 42 sets for transport from LGO.
- The best-fit curves for T:M ratios were summarized, relative to the 1.0 standard and the alternative standard, in a series of color-coded figures (Figures 2-5 for transport from LGR and Figures 6-9 for transport from LGO). Each horizontal line in the figures represents one migration season for a species/rearing-type/tagging location combination,

with a series of color-coded boxes representing days in the migration season. The color coding indicates on which days the estimated T:M was less than the standard, which days the estimated T:M was greater than the standard, and whether the difference between estimated T:M and standard was significant.

- In most cases, estimated T:M remained constant or increased throughout the migration season. For both species and both rearing types in all migration years before 2006, the estimated T:M ratio exceeded the alternative standard (i.e., exceeded the “higher bar” and so therefore also exceeded the 1.0 standard) for fish that arrived at LGR on May 1 or later, and the difference was usually statistically significant.
- In migration years 2006-2008 there have been some exceptions to the post-May 1 pattern: estimated T:M still usually increased through the season, but there were instances when the estimate did not exceed the standards until later in May, and for hatchery Chinook in 2006 the estimated T:M was less than 1.0 throughout the season. It is difficult to determine at this point whether altered spill operations and returning all bypassed smolts to the river during the early part of the migrations in 2006-2008 have resulted in changed T:M ratios compared to earlier years. Estimated T:M ratios for some groups at LGR were apparently lower, at least early in the season (e.g., hatchery steelhead and hatchery Chinook 2006, wild Chinook 2006, and hatchery Chinook in 2008). Adult returns are incomplete for some of these migration years, and final results cannot be evaluated for another year or two.
- The analyses presented in this report are intended to assist managers with the decision of when to transport during the spring migrant period. As noted by the Independent Scientific Advisory Board (ISAB 2008-5), besides T:M ratios for spring-summer Chinook and steelhead, managers should also consider other factors, including maintaining the ability to learn how populations respond to current dam configurations under a range of operations and conditions, the effect of transport on straying rates, and the response to transport of ESUs other than spring/summer Chinook and steelhead. Additional years of adult returns from ongoing and future studies are needed to fully elucidate these issues.

Analyses of Juvenile Chinook Salmon and Steelhead Transport From Lower Granite and Little Goose Dams 1998-2008

February 17, 2010
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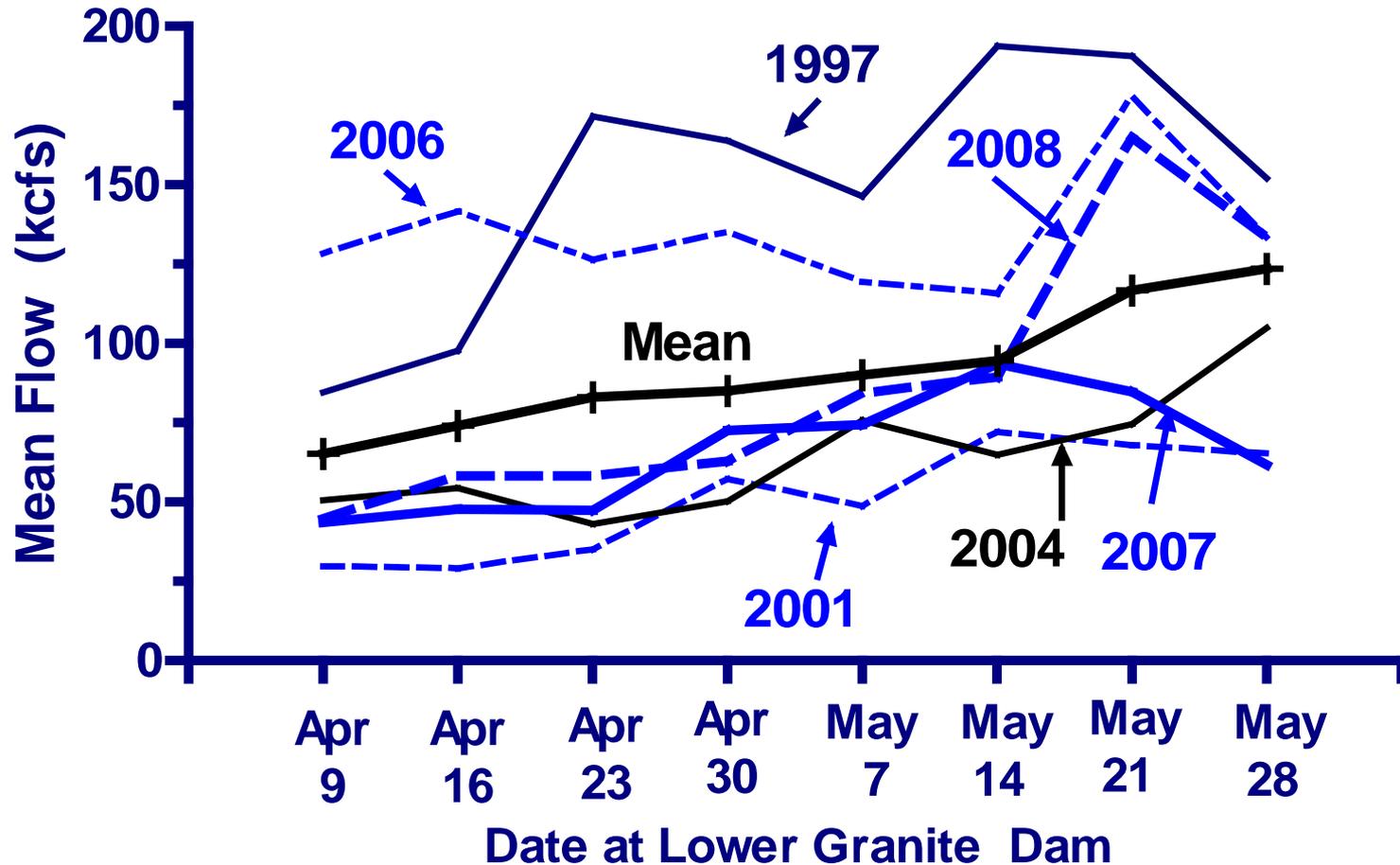
Outline

- Background
 - 2006-2009 operations differ from 1998-2005
 - Spill, transport, surface collectors, predation rate
 - Juvenile travel time and survival

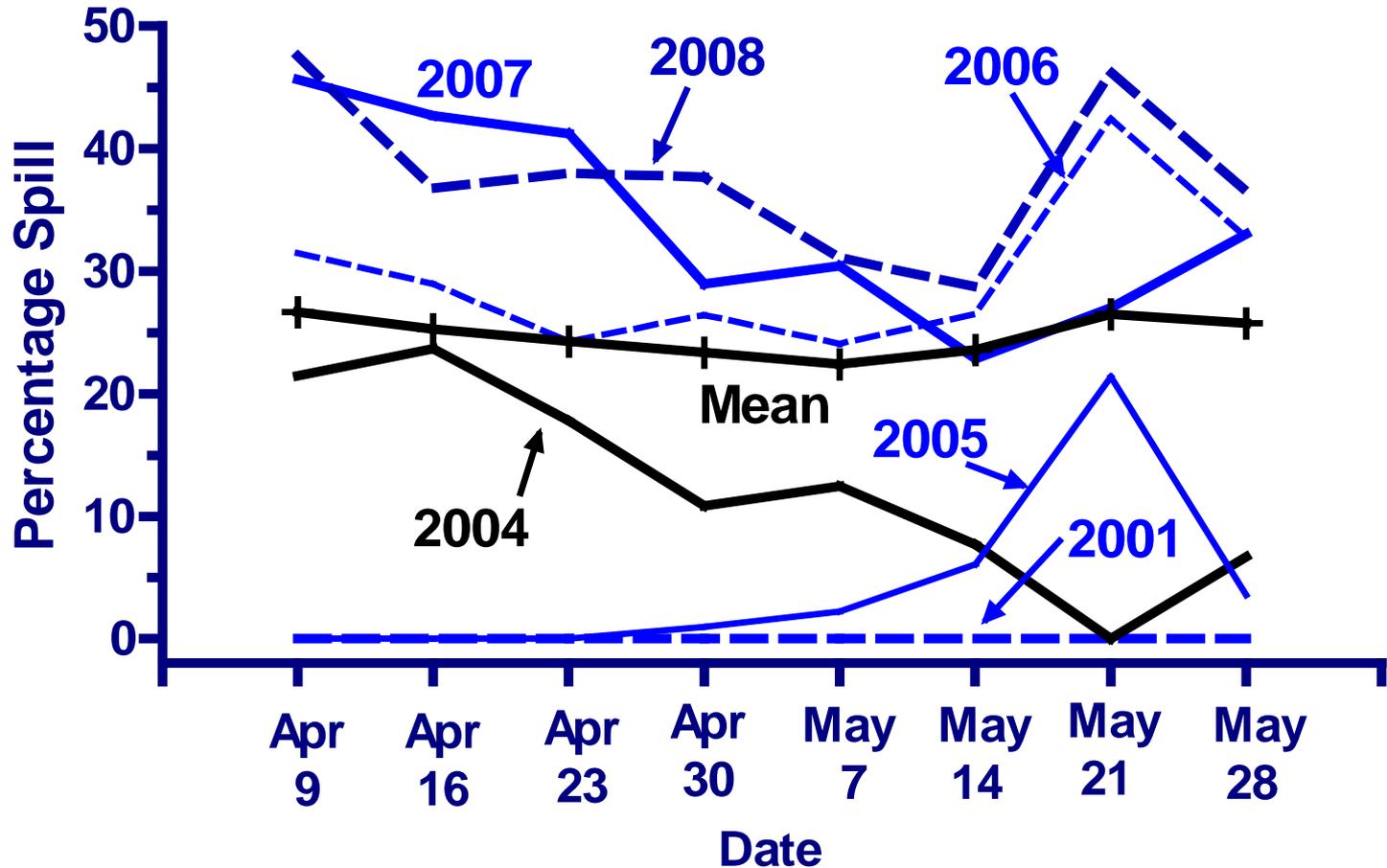
Outline

- Background
 - 2006-2009 operations differ from 1998-2005
 - Spill, transport, surface collectors, predation rate
 - Juvenile travel time and survival
- Analyses of Smolt-to-Adult Return Rates (SARs)
 - Do differences in operations, juvenile survival, travel time result in differences in SARs?
 - Absolute differences in SARs?
 - Relative differences in SARs for transported and in-river migrant fish?
 - Caveats for analyses to date

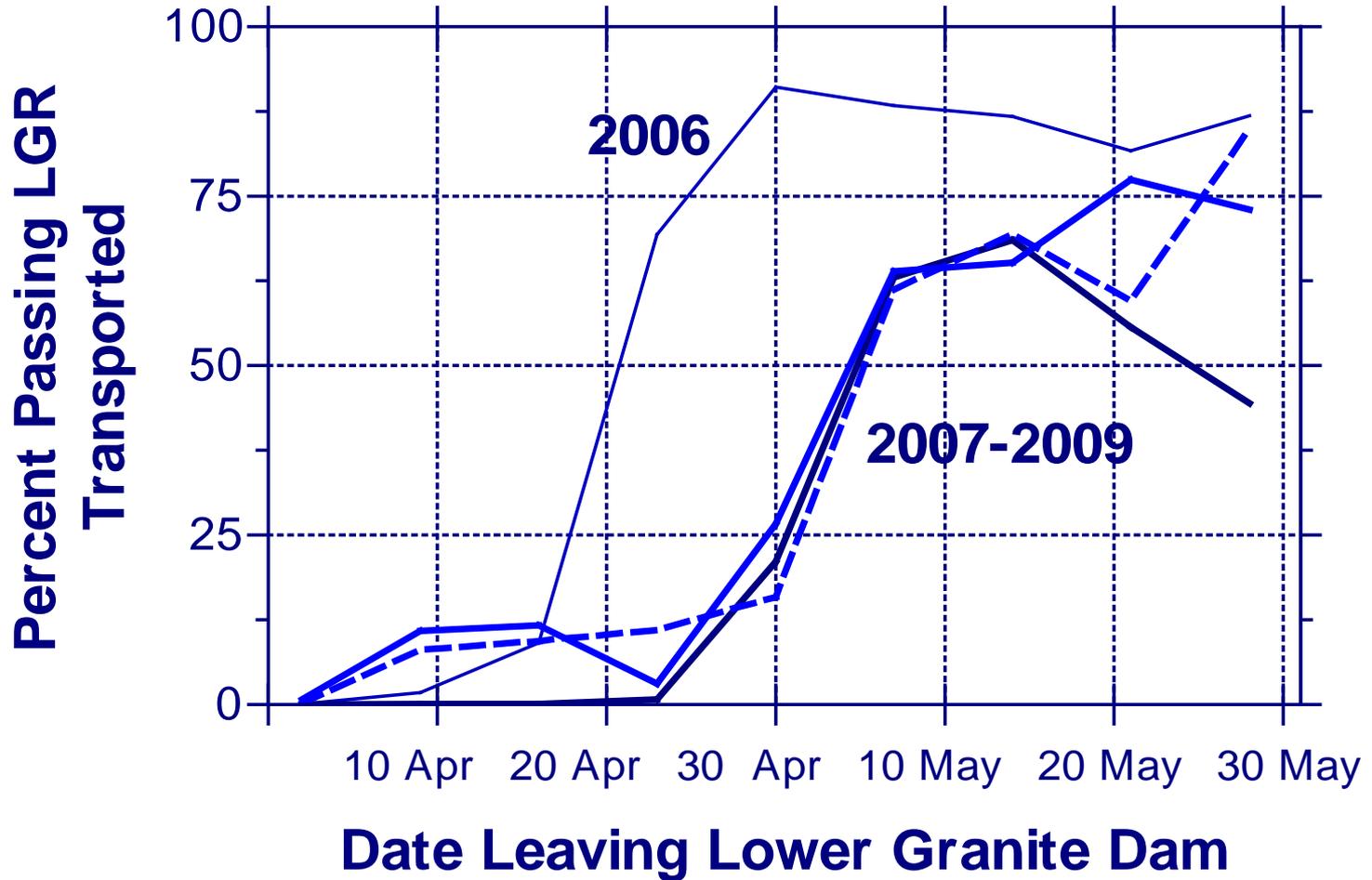
Weekly Mean Flow (kcfs) Lower Granite Dam 1997-2008



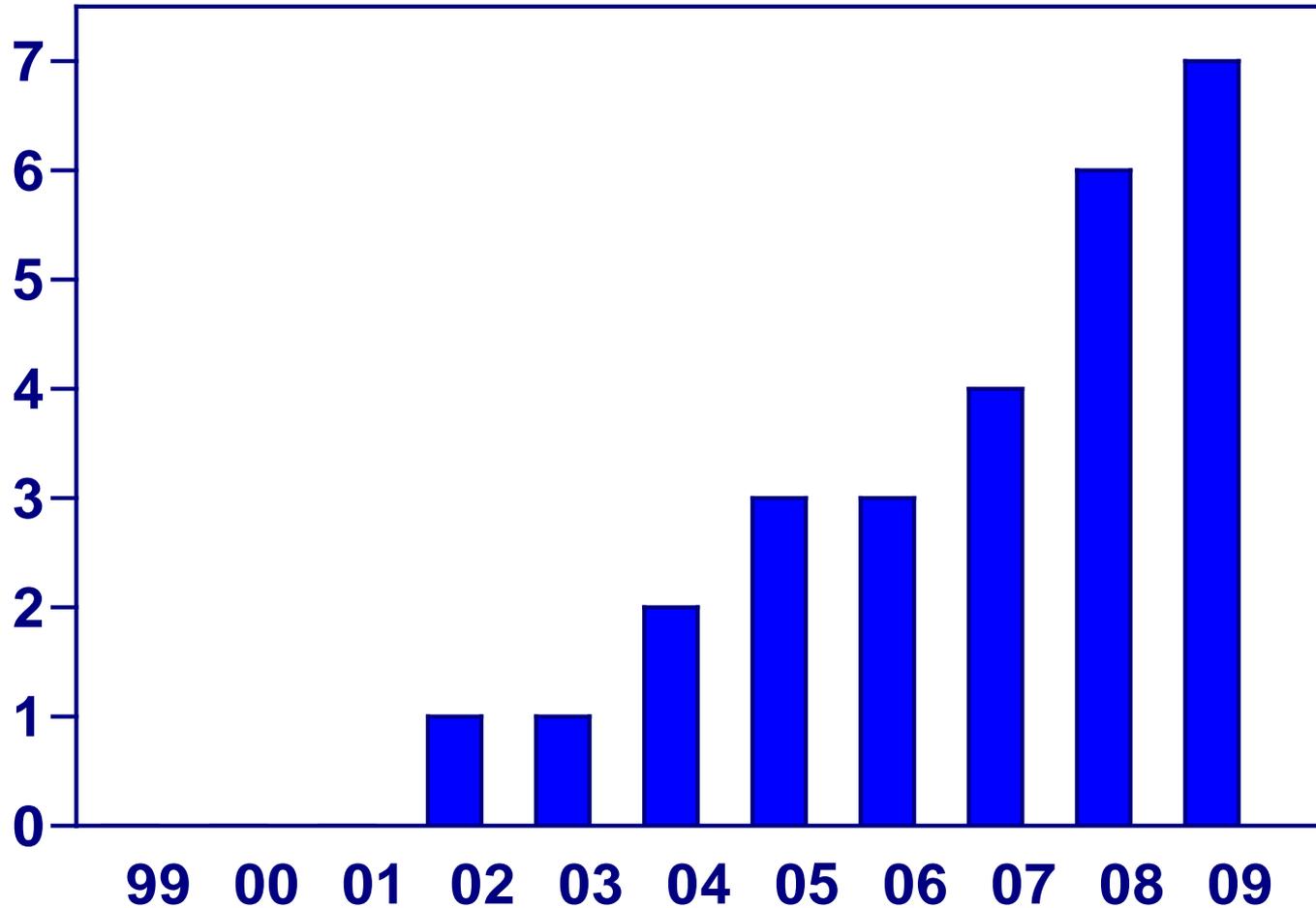
Weekly Mean %Spilled LGR, LGS, LMN 1997-2008



Weekly Percentage Passing LGR That Were Eventually Transported Wild Chinook

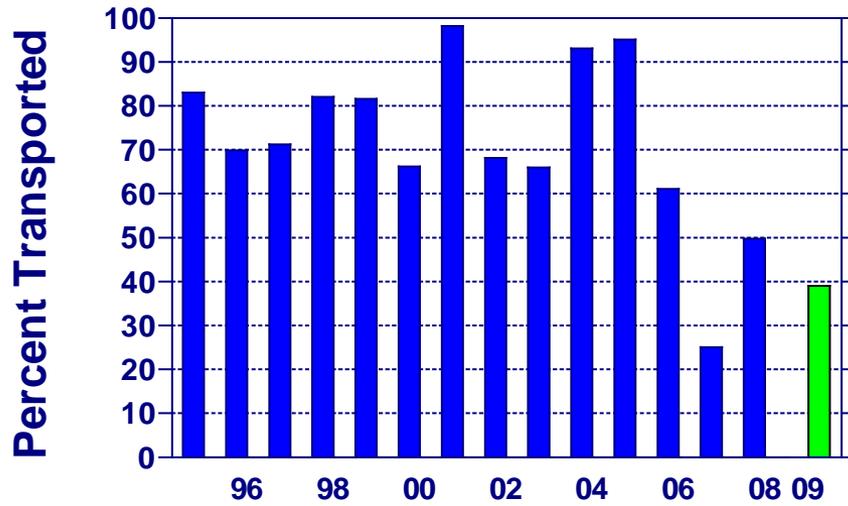


Number of Dams with Surface Bypass Collectors

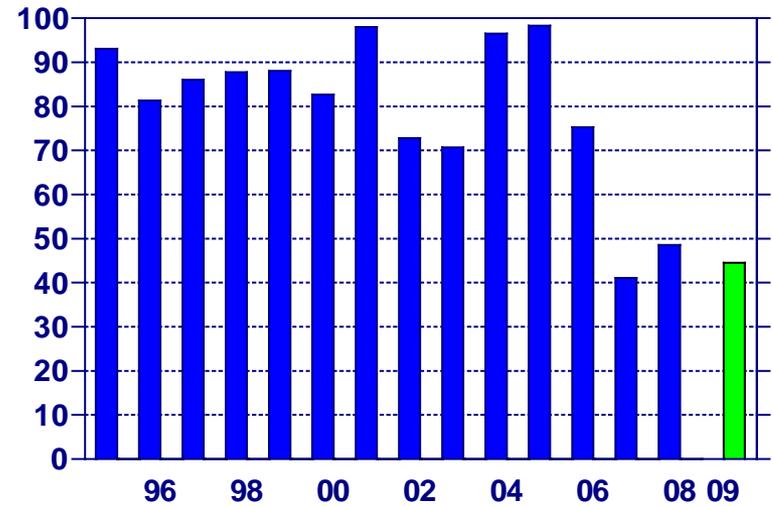


Percent Transported to Below Bonneville

Yearling Chinook



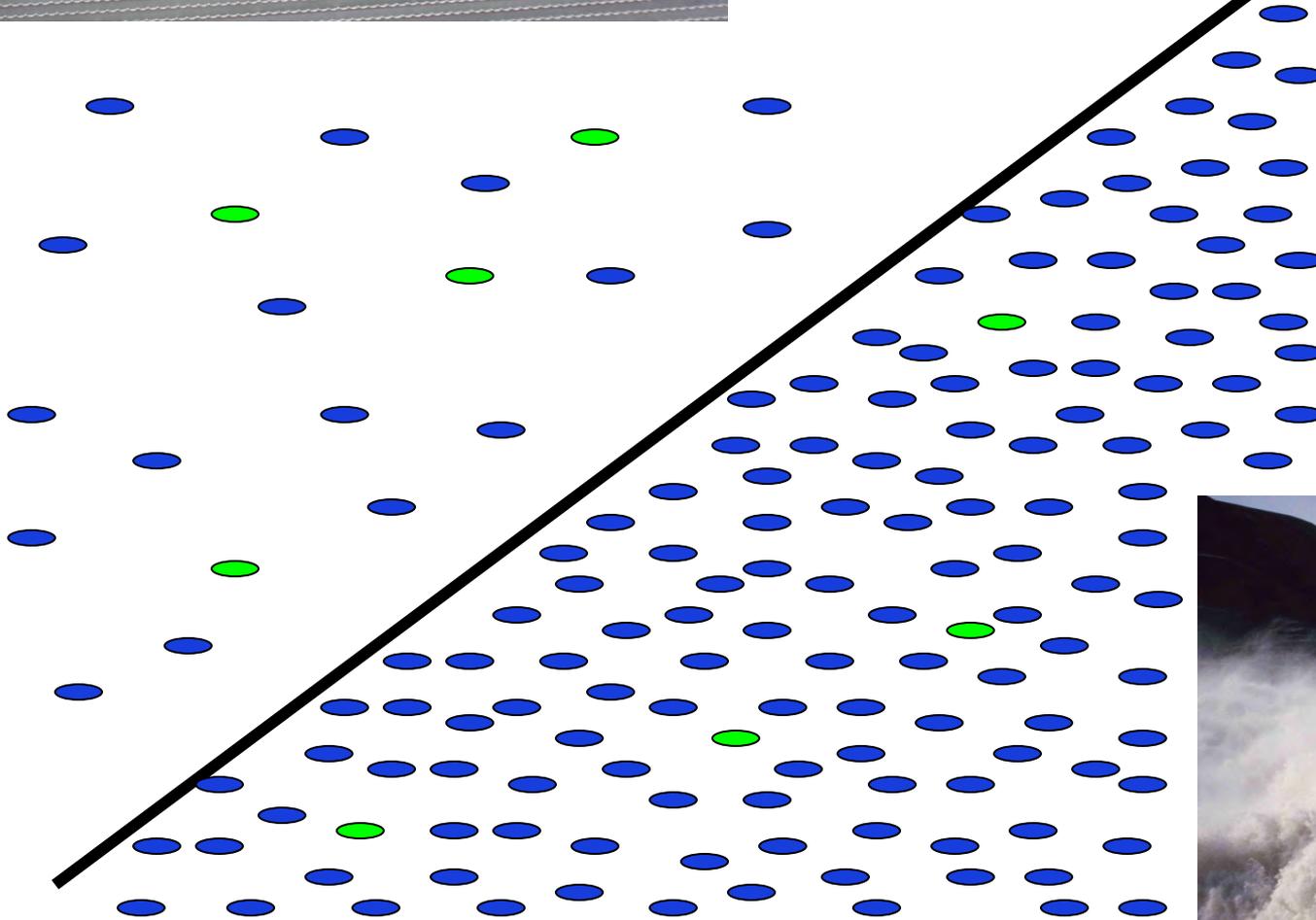
Steelhead



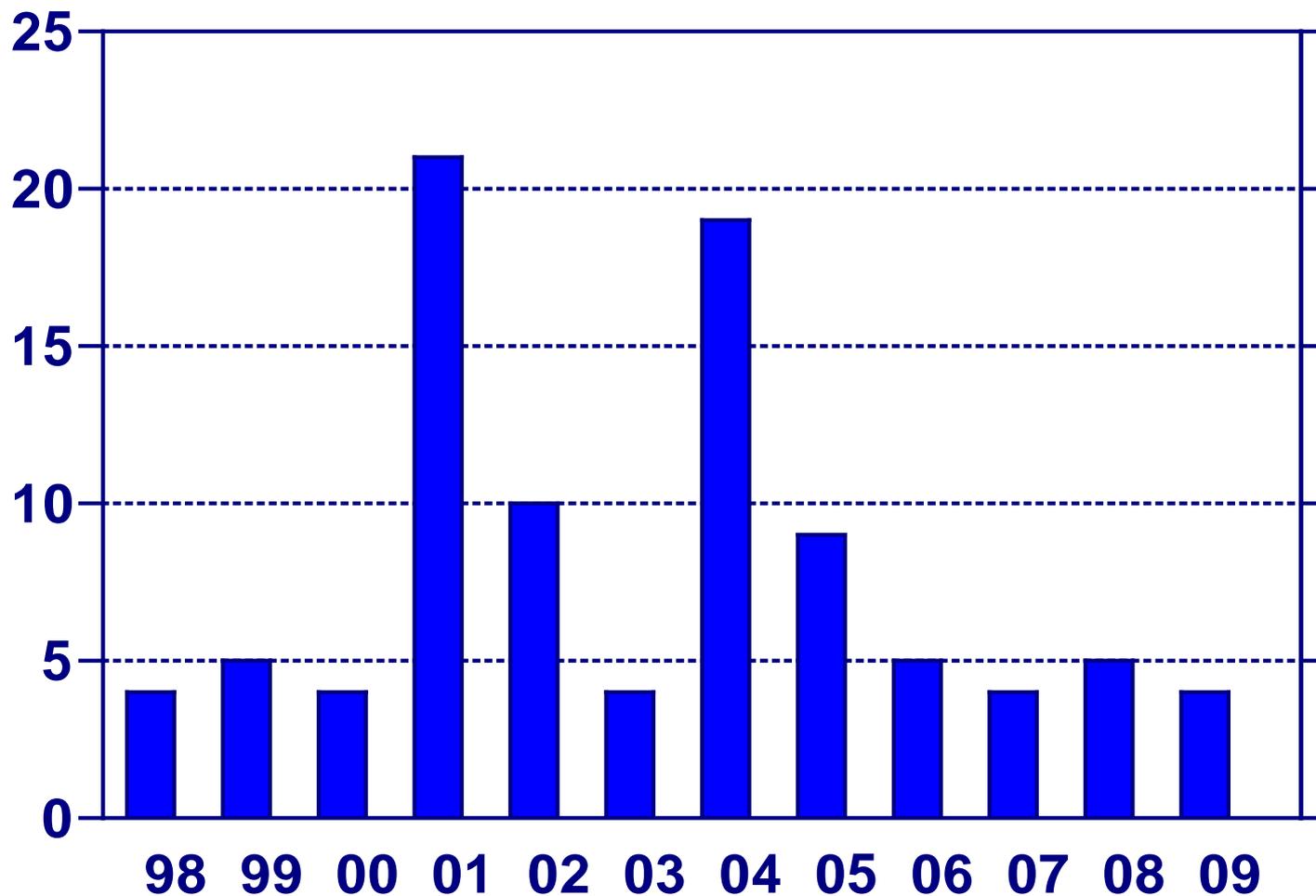


**Maximum
transport**

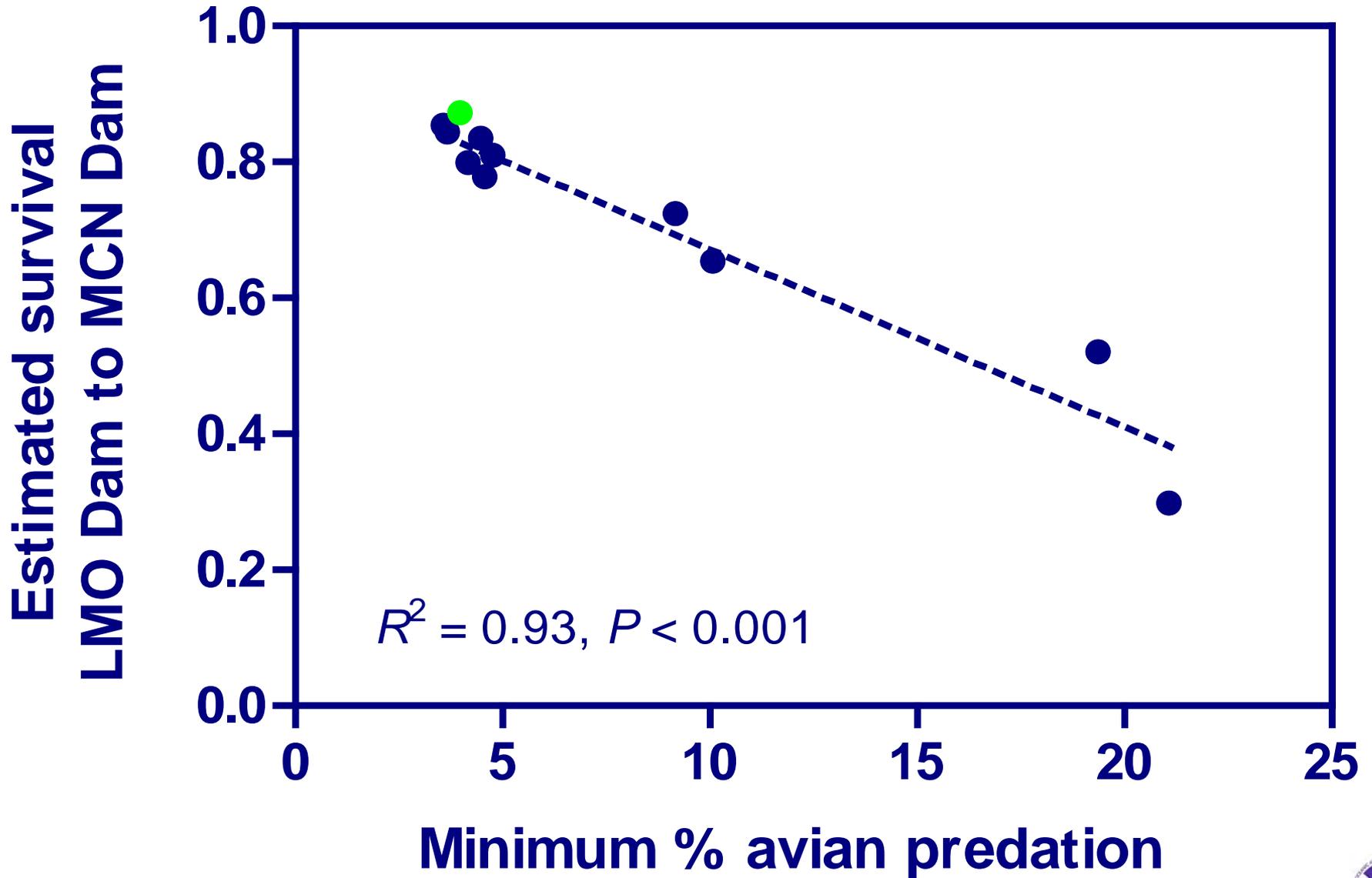
**Transport
with spill**



Percentage of steelhead detected at LMN recovered in bird colonies

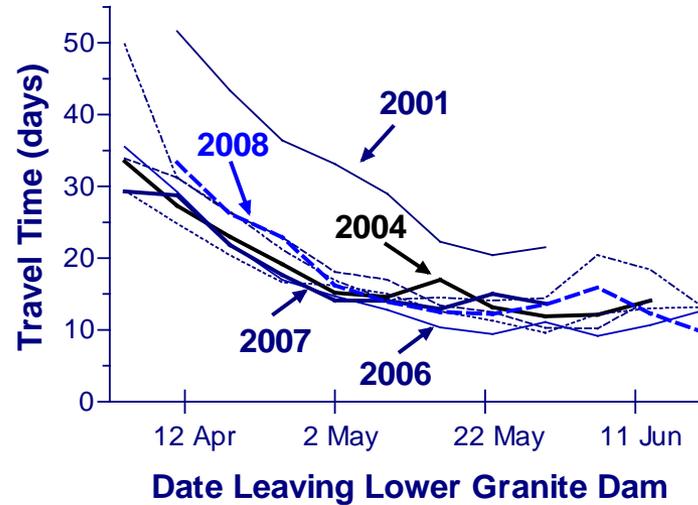


Steelhead

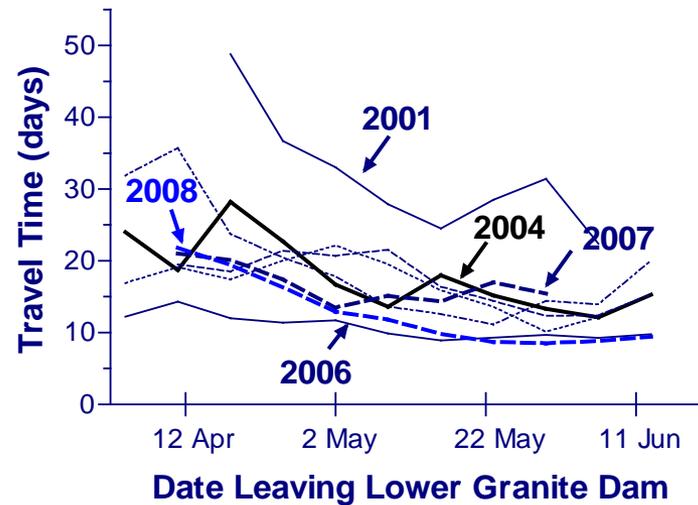


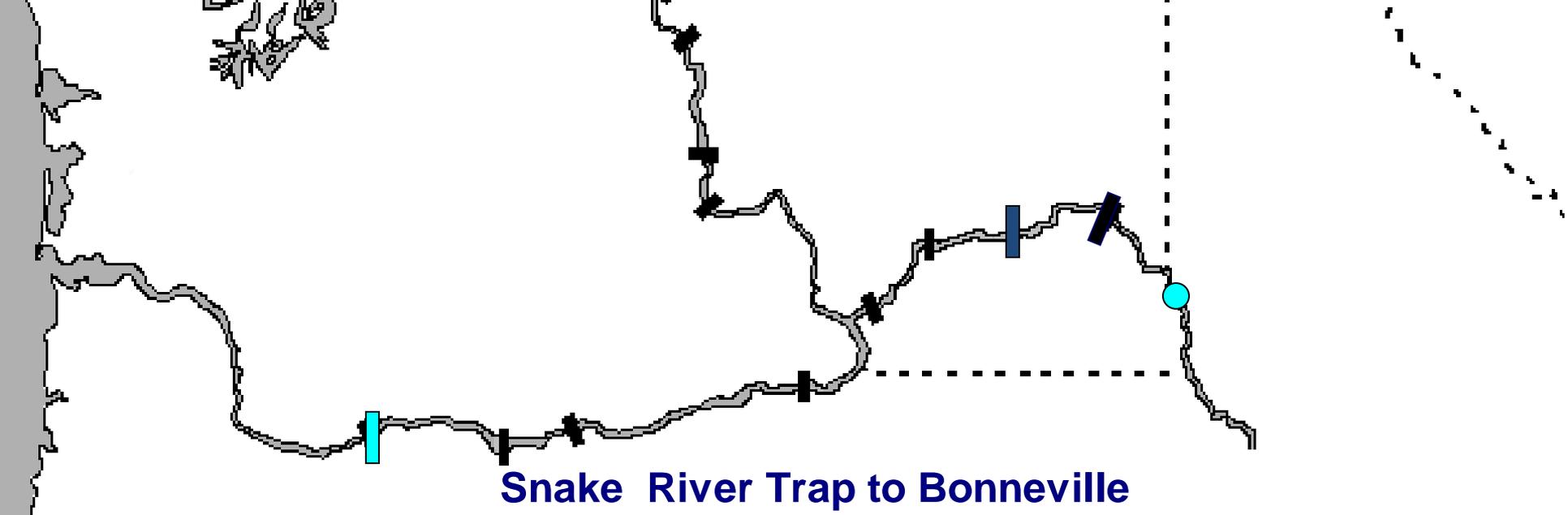
Weekly Median Travel Time 2001-2008 Lower Granite to Bonneville (461 km)

Yearling Chinook



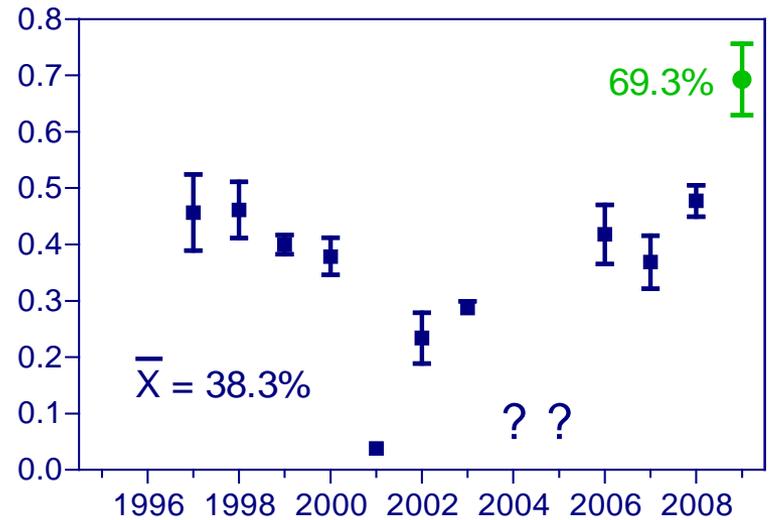
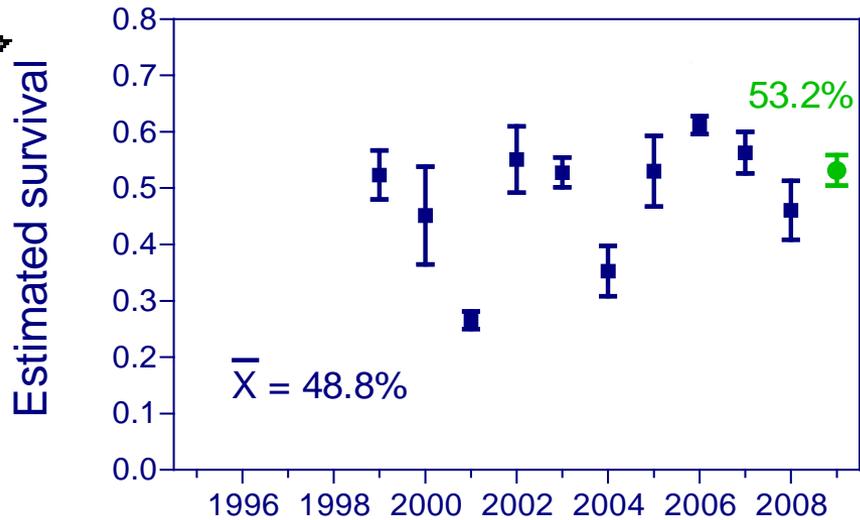
Steelhead





Stream-type Chinook

Steelhead



Analyses of Smolt-to-Adult Return Rates

Do differences in operations, travel time, juvenile survival, result in differences in SARs?

Caveats

- **Analyses are:**
 - **Mostly based on available (adventitious) data**

- **Analyses are not:**
 - **Based on planned, designed experiments**

Caveats

- **Analyses are:**
 - **Mostly based on available (adventitious) data**
 - **Restricted by dates of adventitious data**

- **Analyses are not:**
 - **Based on planned, designed experiments**
 - **Able to shed much light on transport early in the season, 2006-2008**

Caveats

- **Analyses are:**
 - **Mostly based on available (adventitious) data**
 - **Restricted by dates of adventitious data**
 - **Descriptive of patterns in SARs through time within seasons**

- **Analyses are not:**
 - **Based on planned, designed experiments**
 - **Able to shed much light on transport early in the season, 2006-2008**
 - **Prescriptive for transport on particular dates or under particular conditions**

Caveats

- **Analyses are:**
 - Mostly based on available (adventitious) data
 - Restricted by dates of adventitious data
 - Descriptive of patterns in SARs through time within seasons
 - Based on in-river migrants that were bypassed

- **Analyses are not:**
 - Based on planned, designed experiments
 - Able to shed much light on transport early in the season, 2006-2008
 - Prescriptive for transport on particular dates or under particular conditions
 - Based on non-bypassed in-river migrants fish, because we have to know dates of passage

Caveats

- **Analyses are:**
 - Mostly based on available (adventitious) data
 - Restricted by dates of adventitious data
 - Descriptive of patterns in SARs through time within seasons
 - Based on in-river migrants that were bypassed
 - Subject to confounding of mortality and straying

- **Analyses are not:**
 - Based on planned, designed experiments
 - Able to shed much light on transport early in the season, 2006-2008
 - Prescriptive for transport on particular dates or under particular conditions
 - Based on non-bypassed in-river migrants fish, because we have to know dates of passage
 - Able to determine effects of transport on straying

Caveats

- **Analyses are:**
 - Mostly based on available (adventitious) data
 - Restricted by dates of adventitious data
 - Descriptive of patterns in SARs through time within seasons
 - Based on in-river migrants that were bypassed
 - Subject to confounding of mortality and straying
 - Limited by small numbers of adult returns for some years
- **Analyses are not:**
 - Based on planned, designed experiments
 - Able to shed much light on transport early in the season, 2006-2008
 - Prescriptive for transport on particular dates or under particular conditions
 - Based on non-bypassed in-river migrants fish, because we have to know dates of passage
 - Able to determine effects of transport on straying

Caveats

- **Analyses are:**
 - Mostly based on available (adventitious) data
 - Restricted by dates of adventitious data
 - Descriptive of patterns in SARs through time within seasons
 - Based on in-river migrants that were bypassed
 - Subject to confounding of mortality and straying
 - Limited by small numbers of adult returns for some years
 - Based on incomplete adult return data for recent migration years
- **Analyses are not:**
 - Based on planned, designed experiments
 - Able to shed much light on transport early in the season, 2006-2008
 - Prescriptive for transport on particular dates or under particular conditions
 - Based on non-bypassed in-river migrants fish, because we have to know dates of passage
 - Able to determine effects of transport on straying

Data

- Daily estimates of smolt-to-adult return rates (SARs)
 - Four groups of smolts for each species/rear-type/migration season:
 - Smolts collected and transported from collector dam and smolts bypassed there and returned to the tailrace
 - Smolts tagged upstream from collector dam or at collector dam
 - Count numbers of PIT-tagged smolts at collector dam in each group each day
 - Count numbers of adults that return to LGR from each daily smolt group
 - Estimated SAR for day i :
$$\hat{SAR}_i = \frac{A_i}{J_i}$$

Statistical Analysis

- For each group from a species/rear-type/migration year:
 - Fit a statistical regression model (Poisson log-linear regression) such that SAR is (potentially) a function of
 - Migration group (transported or in-river migrant)
 - Tagging location (upstream of or at collector dam)
 - Date of passage (day of year)
 - Two-way and three-way interactions of above

Statistical Analysis

- For each group from a species/rear-type/migration year:
 - Fit a statistical regression model (Poisson log-linear regression) such that SAR is (potentially) a function of
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 - Calculate “T:M ratio” (Transport:Migrant) vs. day of year curve and corresponding 95% confidence envelope from best-fit SARs for transport and in-river migrants
 - Assess daily best-fit T:M ratio estimates relative to standards

T:M Standards

- Standard of 1.0
 - Estimated T:M greater than 1.0 indicates that among LGR detected fish, those transported returned at a higher rate than those bypassed

T:M Standards

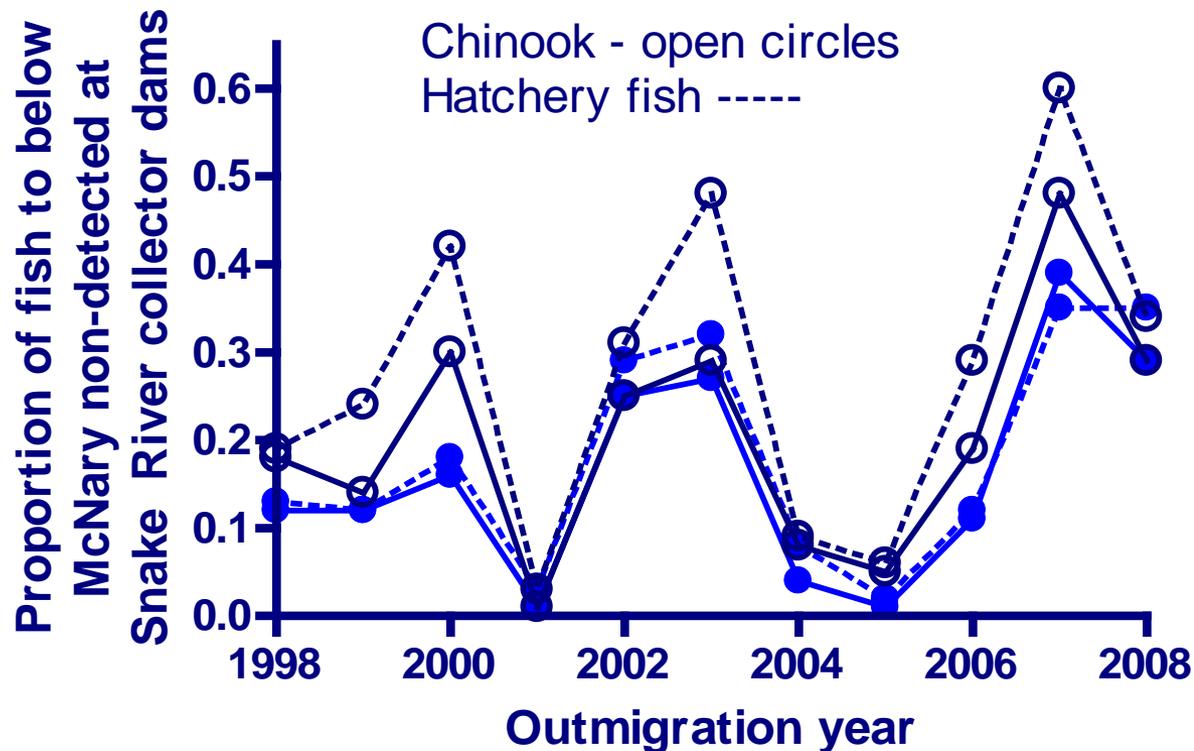
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- Alternative Standard
 - Greater than 1.0; accounts for difference between SARs for non-bypassed and bypassed in-river migrants
 - Estimated T:M greater than alternative standard indicates that transported fish in the run at large returned at a higher rate than in-river migrants in the run at large

T:M Standards

- **Standard of 1.0**
 - **Estimated T:M greater than 1.0 indicates that among LGR detected fish, those transported returned at a higher rate than those bypassed**
- **Alternative Standard**
 - **Greater than 1.0; accounts for difference between SARs for non-bypassed and bypassed in-river migrants**
 - **Estimated T:M from greater than alternative standard indicates that transported fish in the run at large returned at a higher rate than in-river migrants in the run at large**
- **Confidence envelope determines significance of difference**

Alternative T:M Standard

- Value depends on
 - Ratio of SARs for non-bypassed and bypassed in-river migrants
 - Proportion of smolts non-detected



Alternative T:M Standard

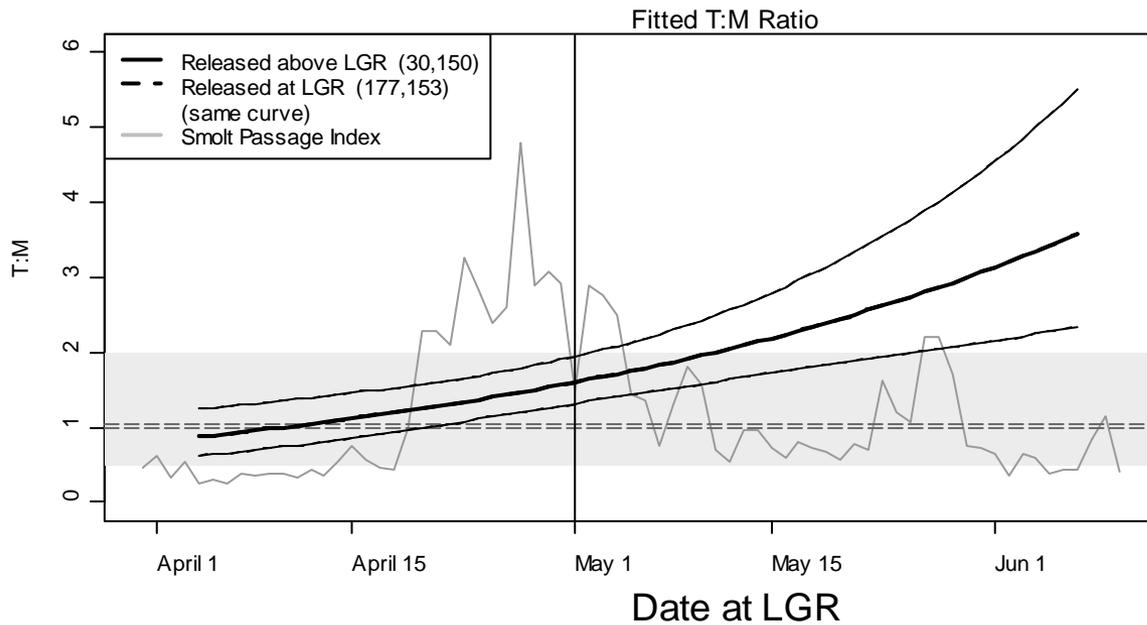
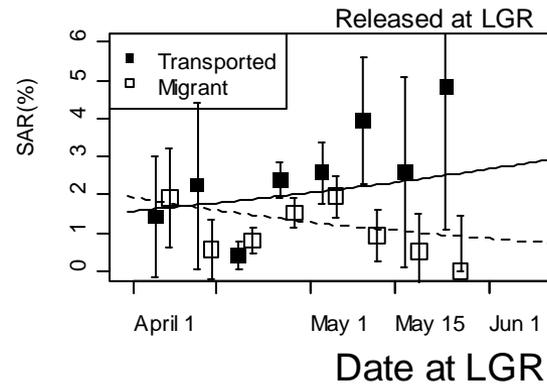
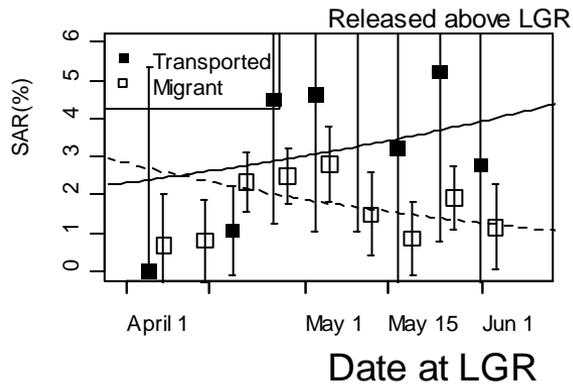
- Value depends on
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 - Proportion of smolts non-detected
 - $(SARCO/SARC1 \times \% ND + 1 \times \% C1)$
- For Transport from LGR compared to bypassed in-river migrants:

	WCH	HCH	WST	HST
1998-2005	1.03	1.11	1.07	1.22
2006	1.02	1.08	1.03	1.10
2007	1.04	1.16	1.11	1.28
2008	1.02	1.09	1.08	1.28

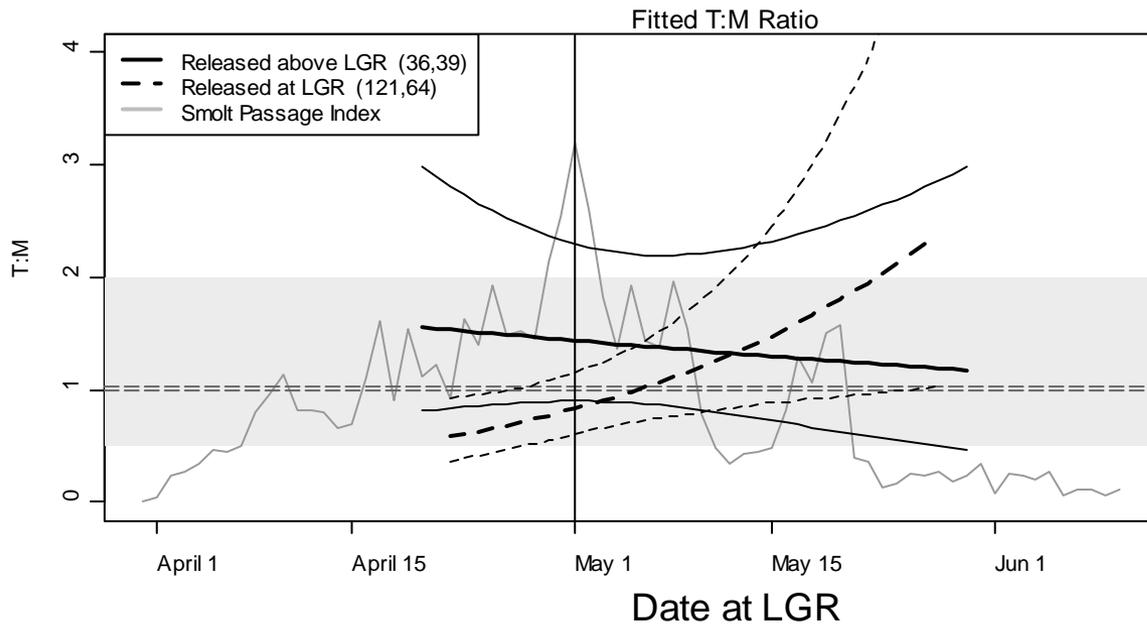
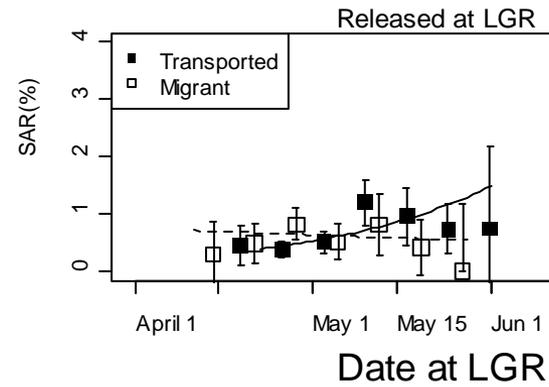
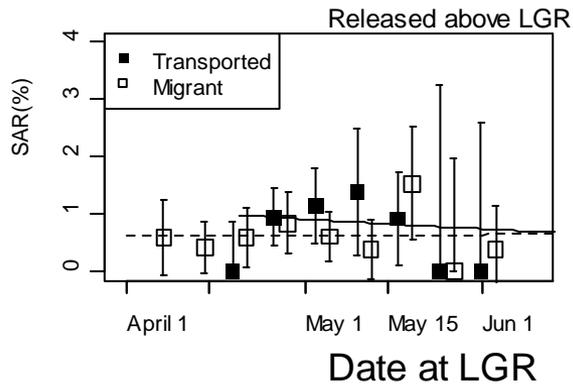
- For transport from LGO compared to bypassed in-river migrants:

	WCH	HCH	WST	HST
1998-2005	1.14	1.27	1.21	1.16
2006	1.08	1.19	1.08	1.07
2007	1.22	1.39	1.31	1.20
2008	1.13	1.22	1.23	1.20

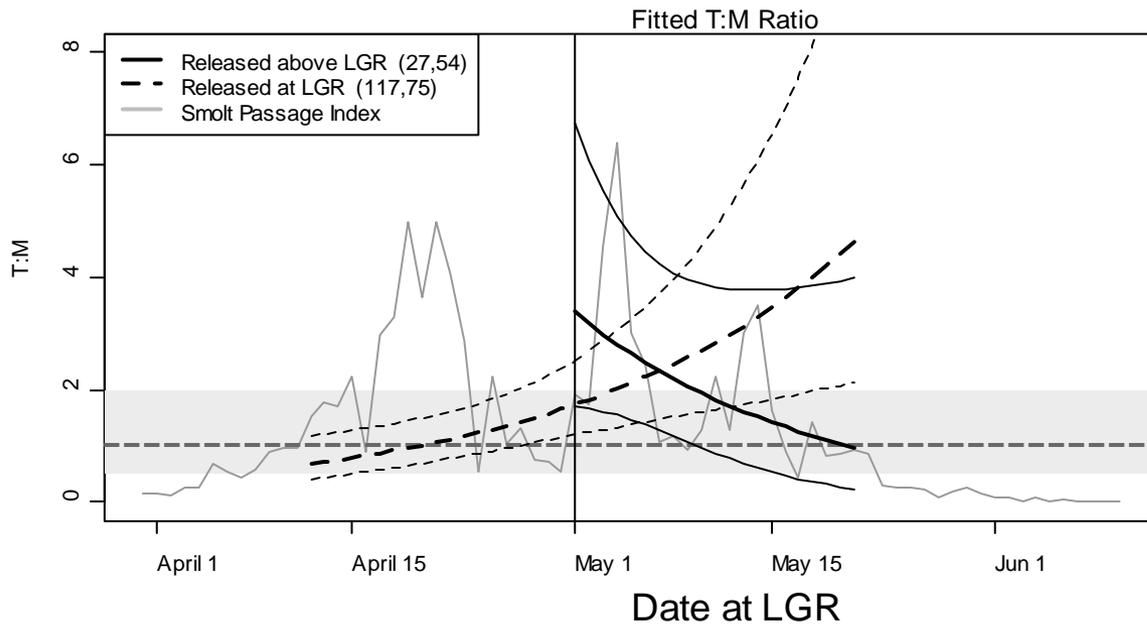
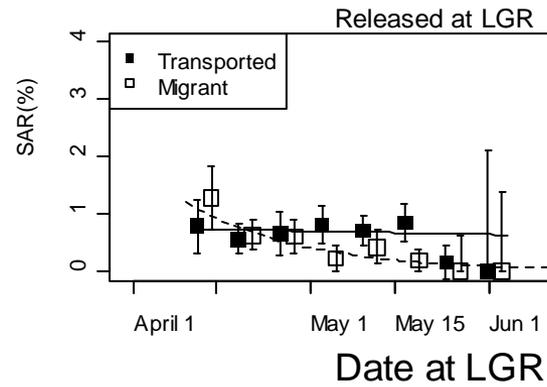
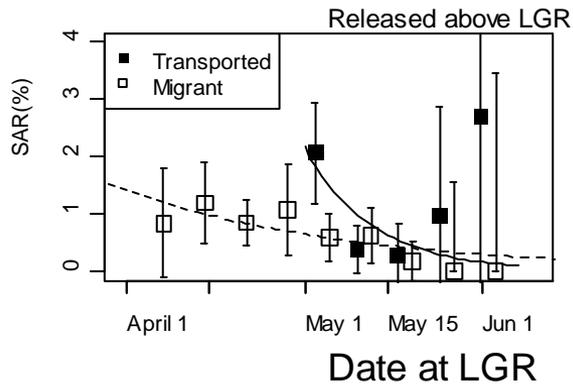
Wild Chinook 1999



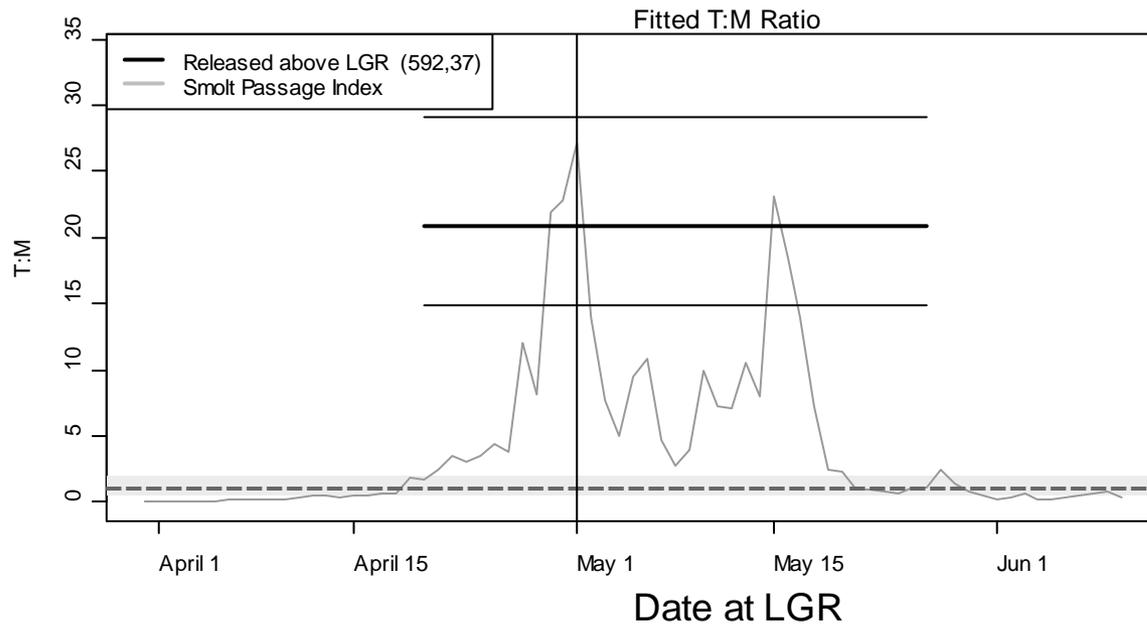
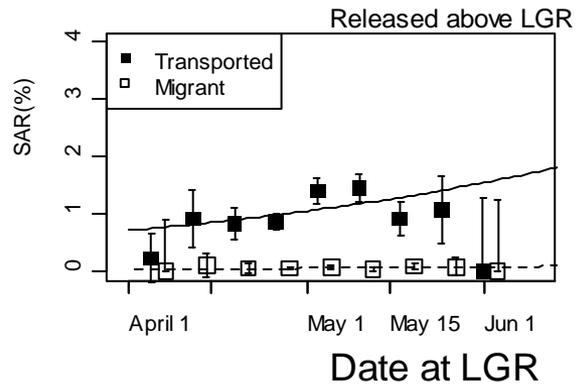
Wild Chinook 2006



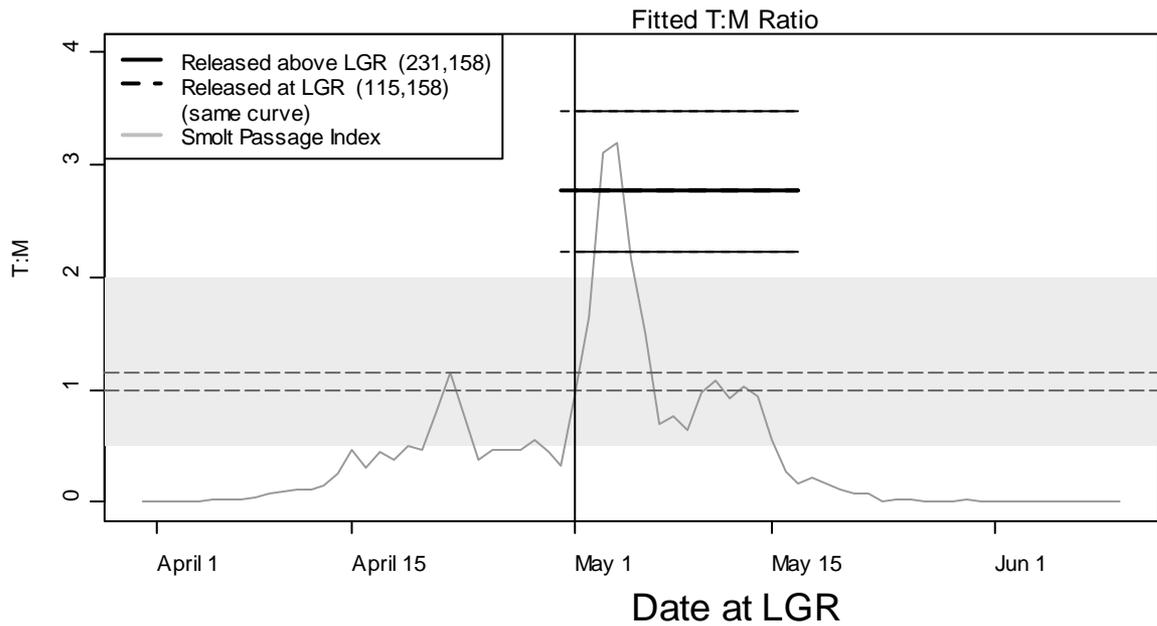
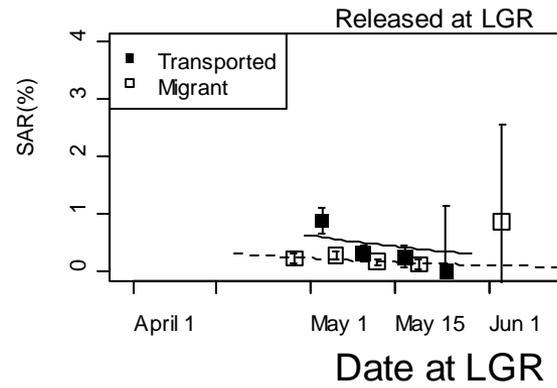
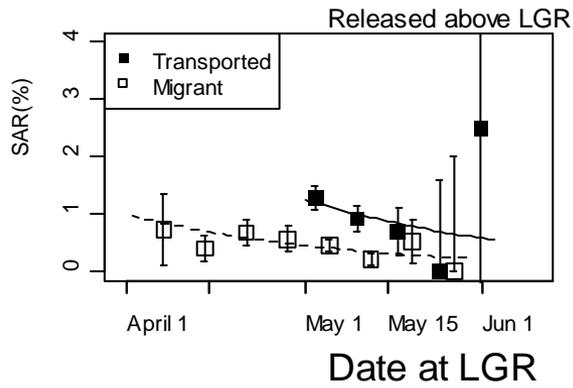
Wild Chinook 2007



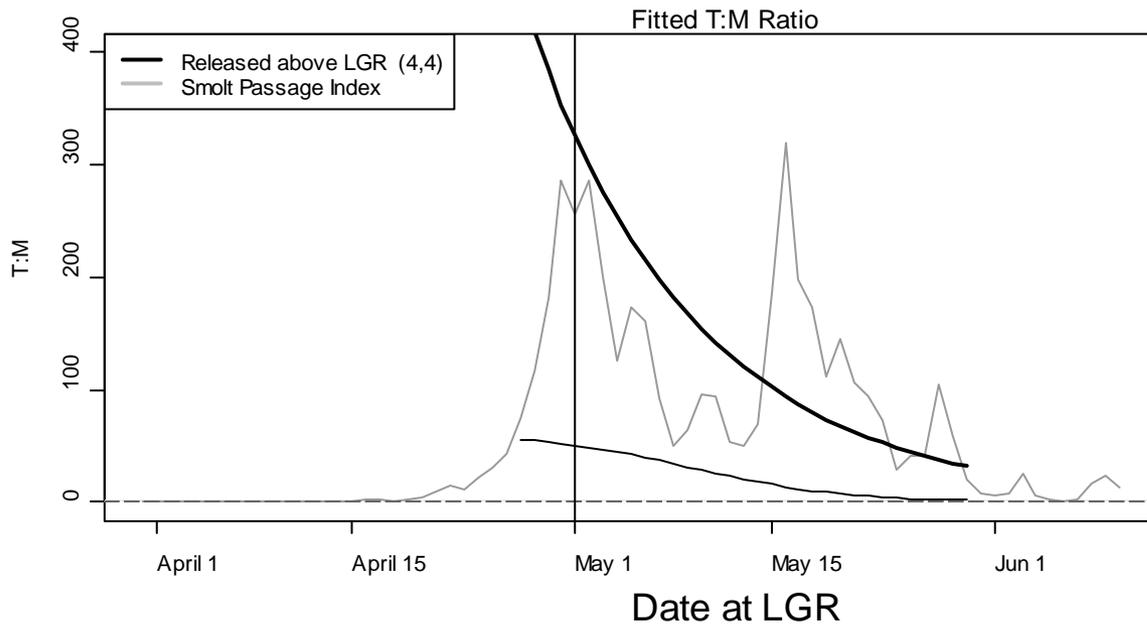
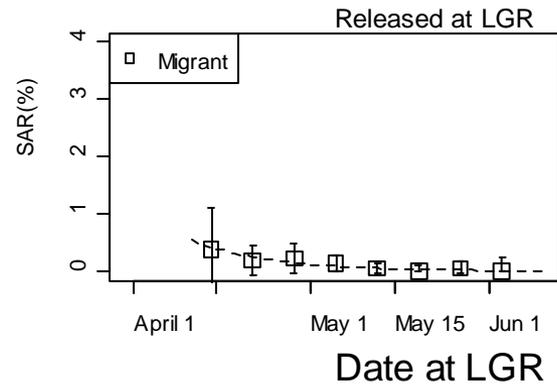
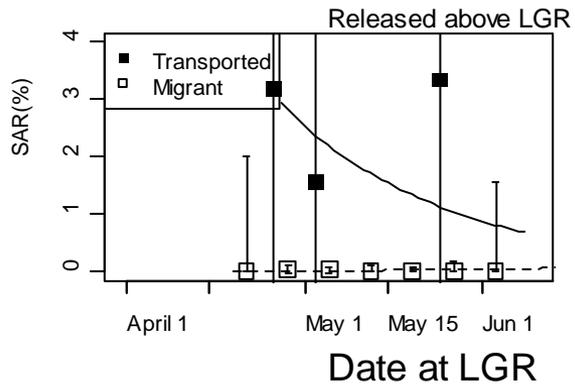
Hatchery Chinook 2001



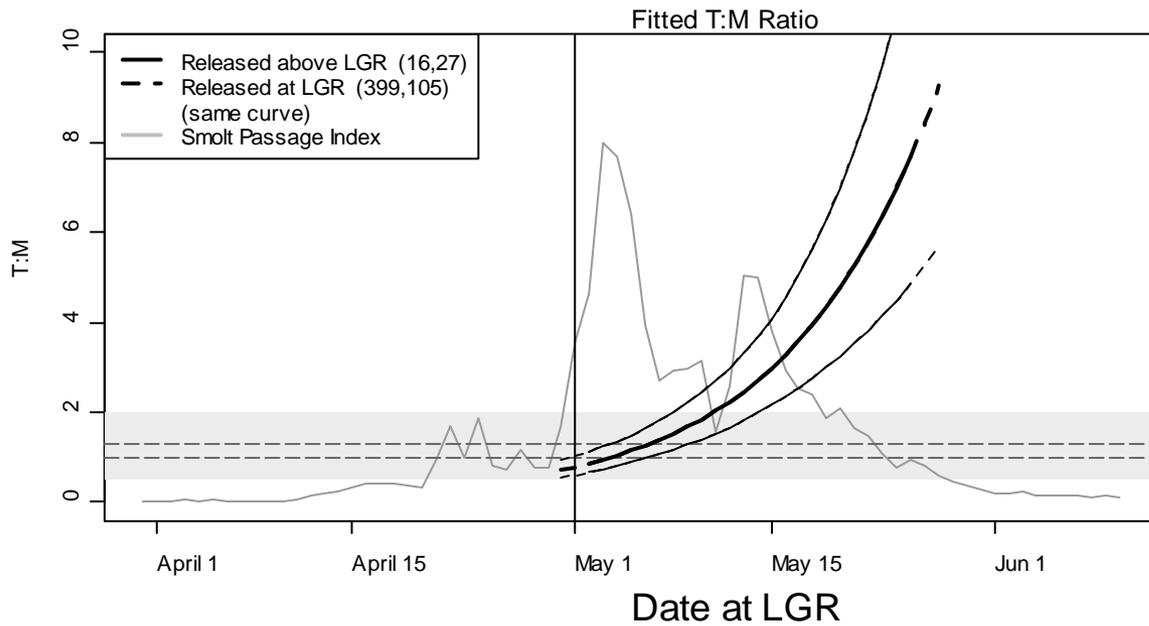
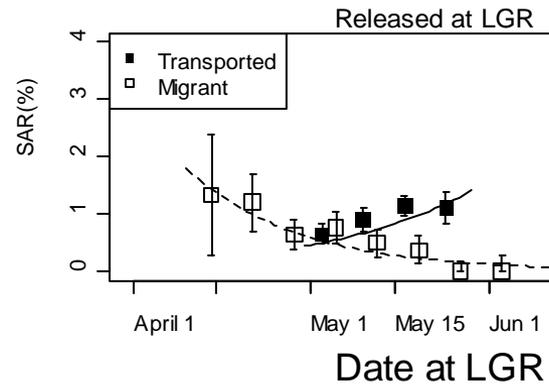
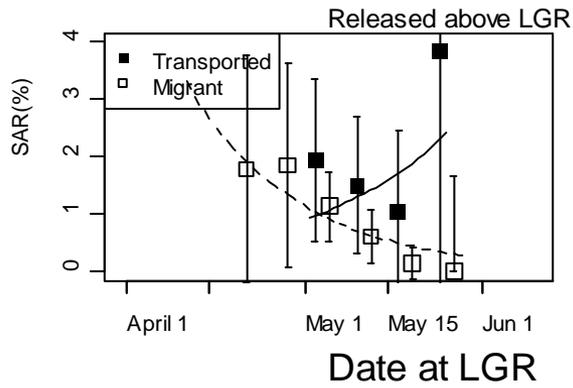
Hatchery Chinook 2007



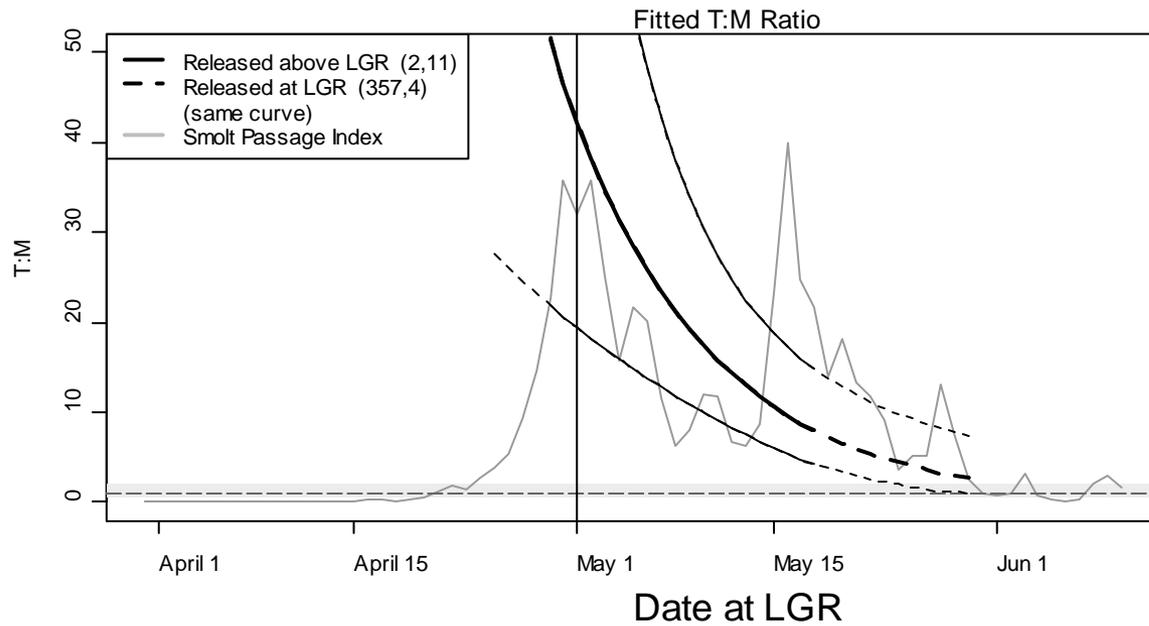
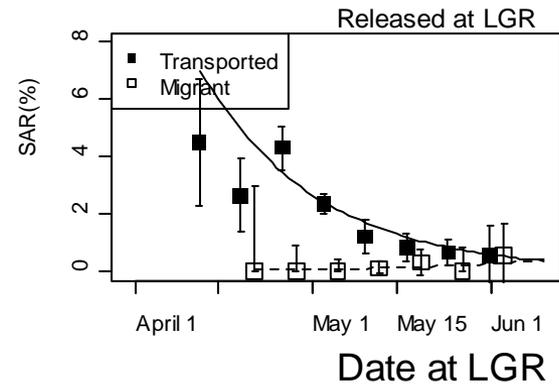
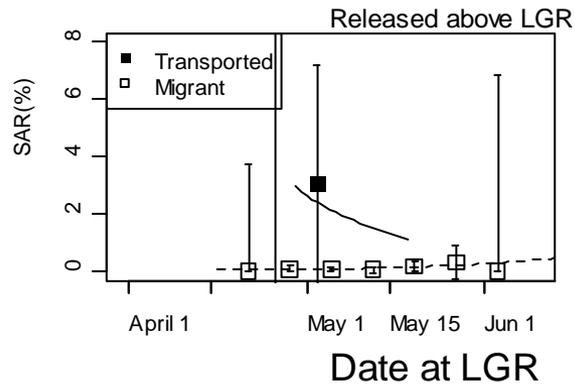
Hatchery Steelhead 2001



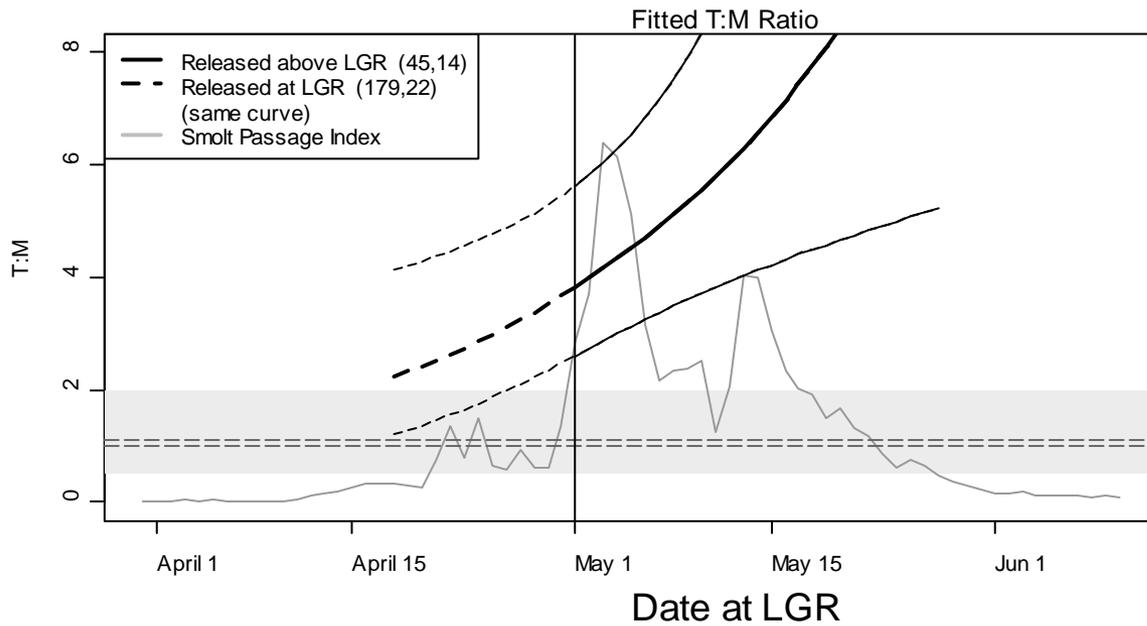
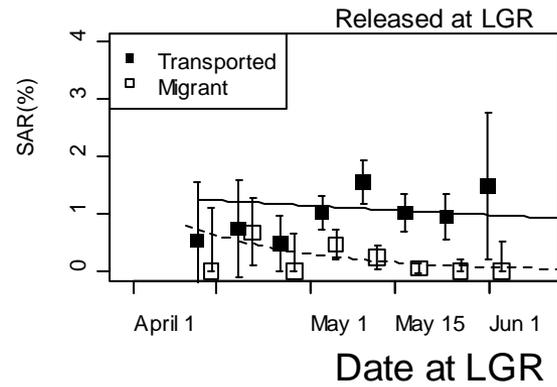
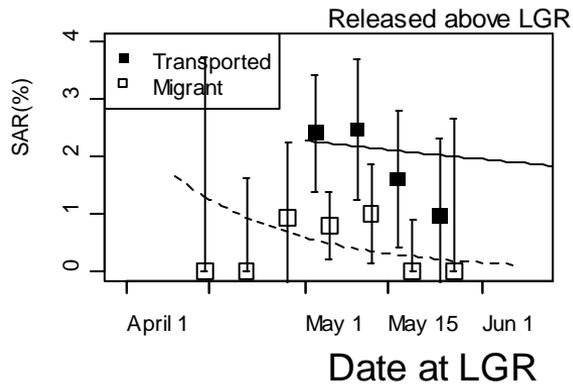
Hatchery Steelhead 2007



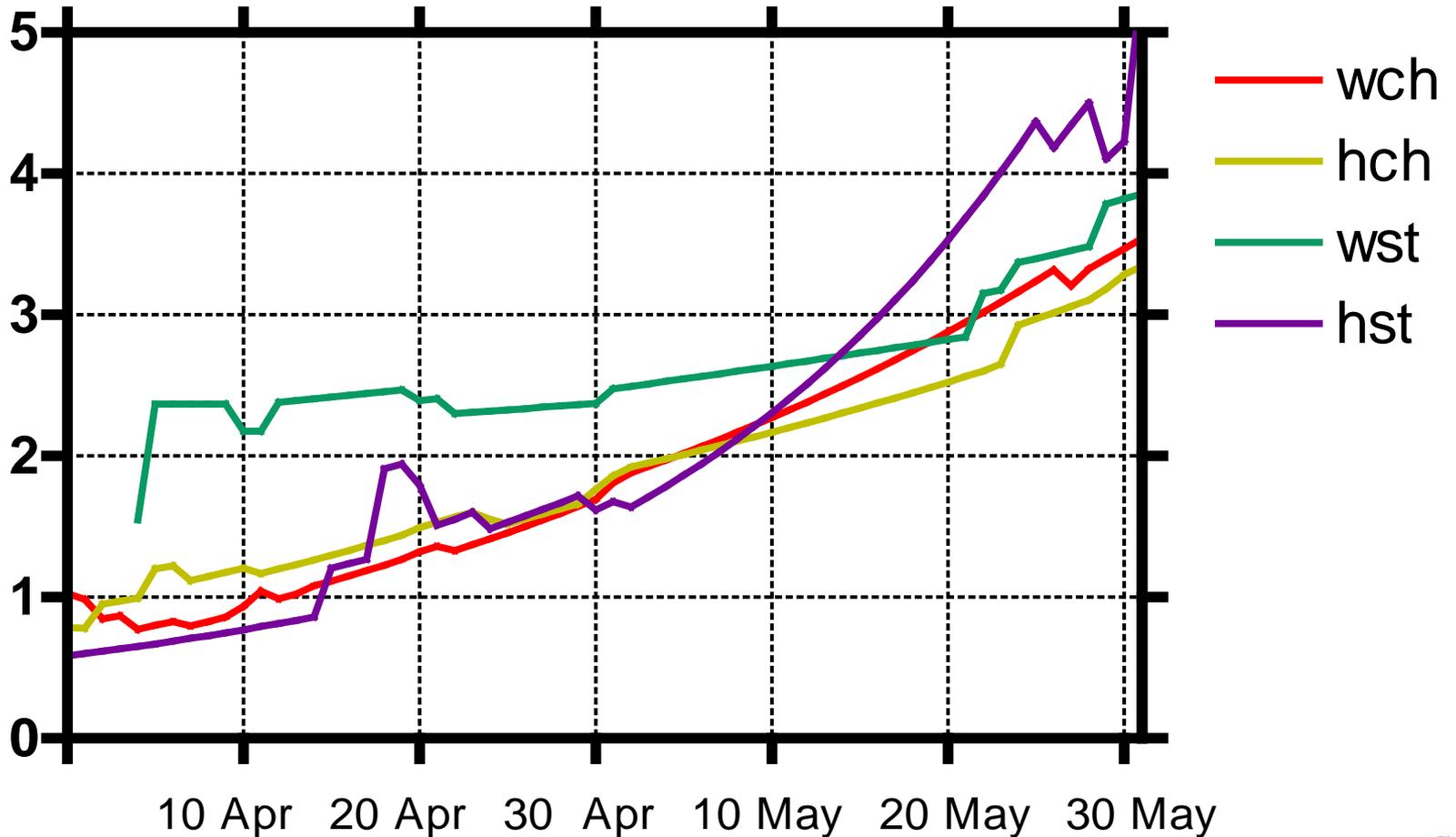
Wild Steelhead 2001



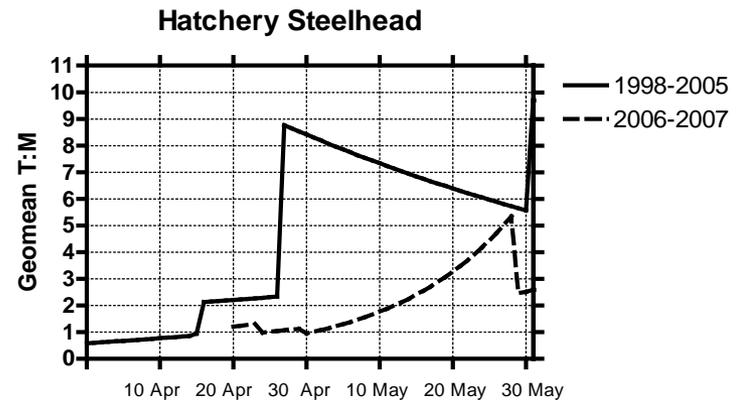
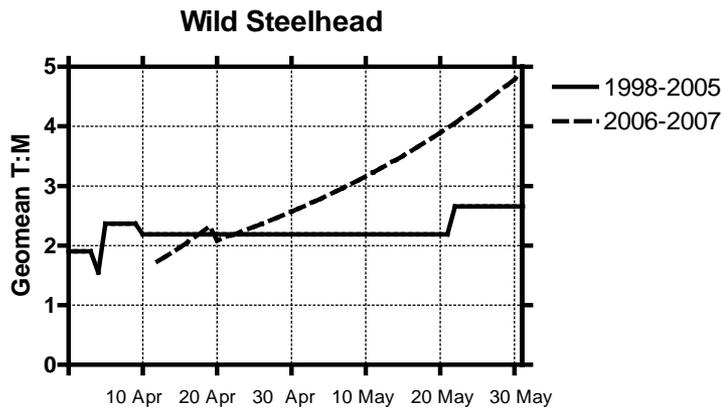
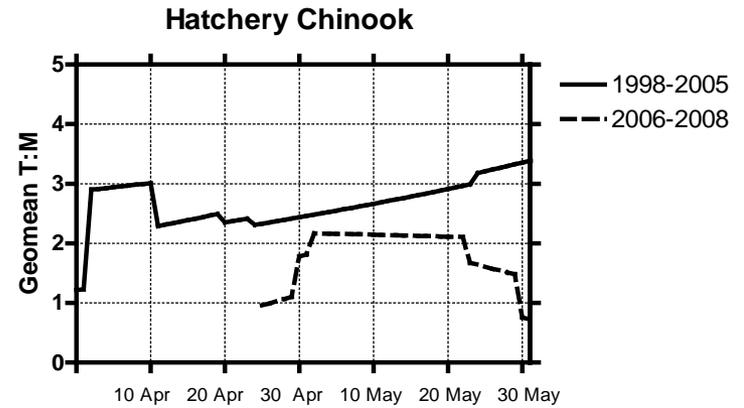
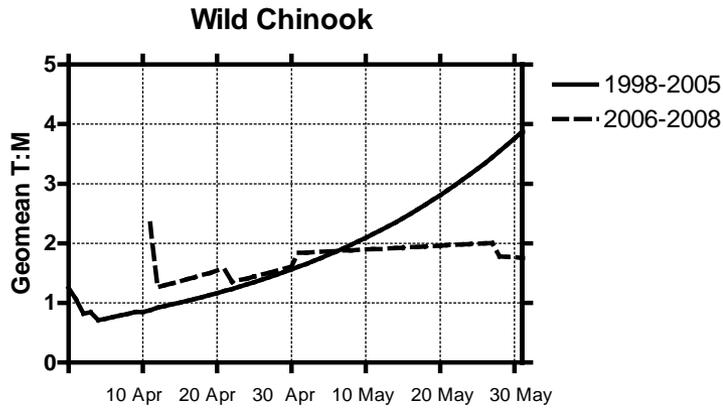
Wild Steelhead 2007



Geometric Mean Estimated T:M All Years

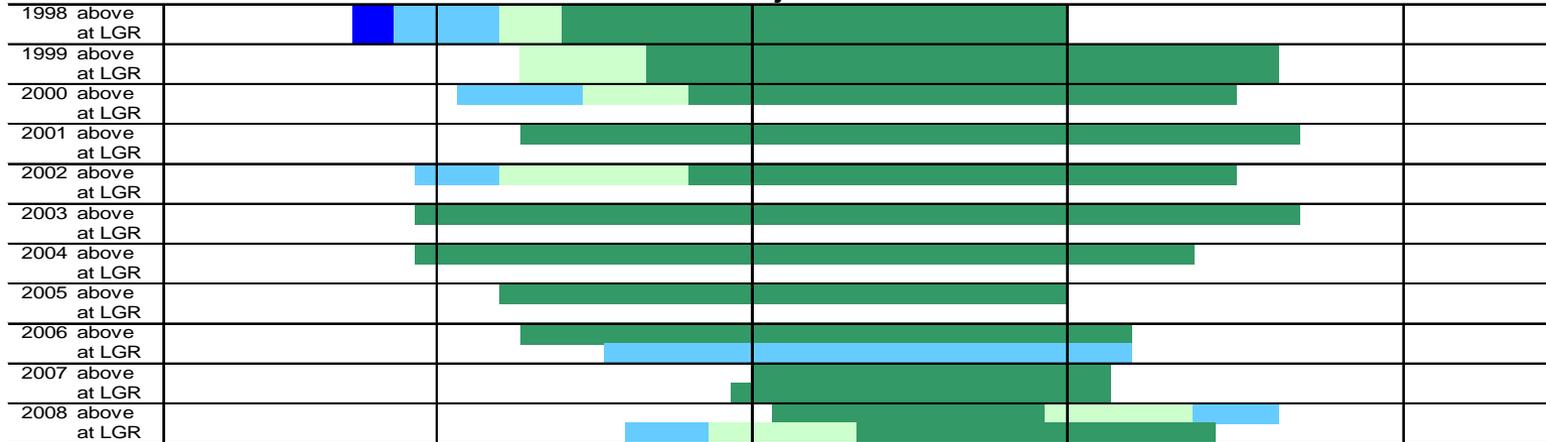


Geometric Means of Estimated T:M (Preliminary Analysis)

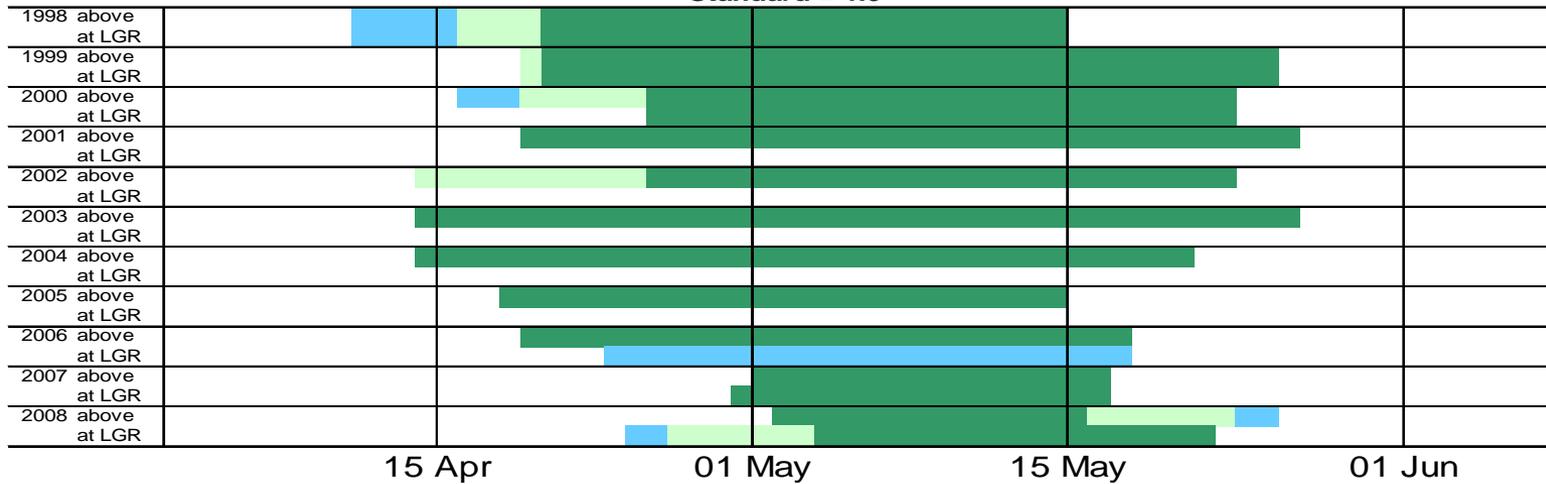


Hatchery Chinook Salmon - Transportation from Lower Granite Dam

Standard = Adjusted Baseline

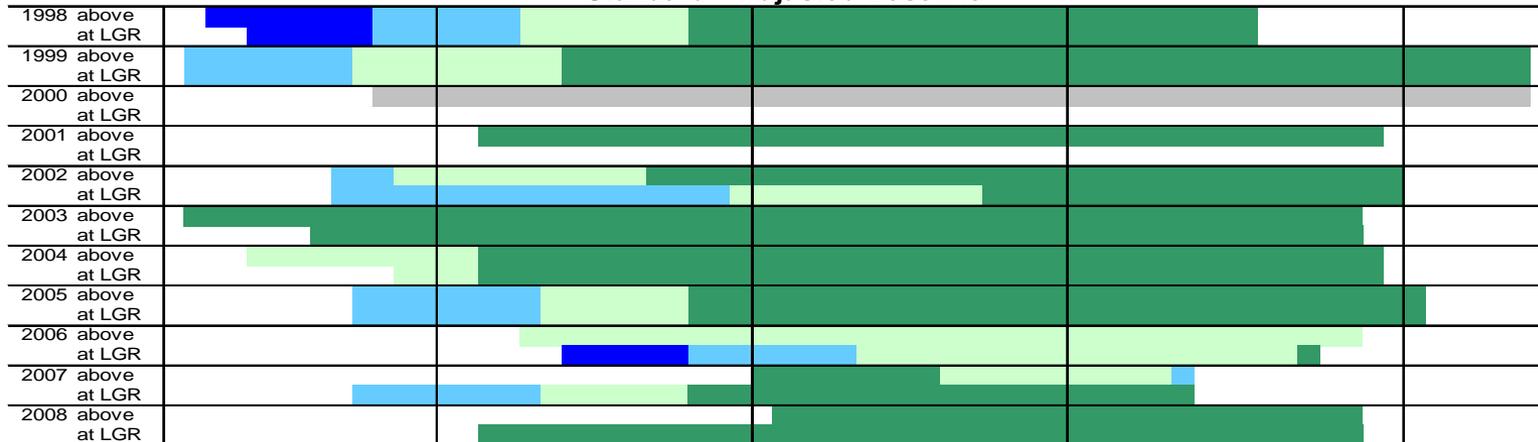


Standard = 1.0

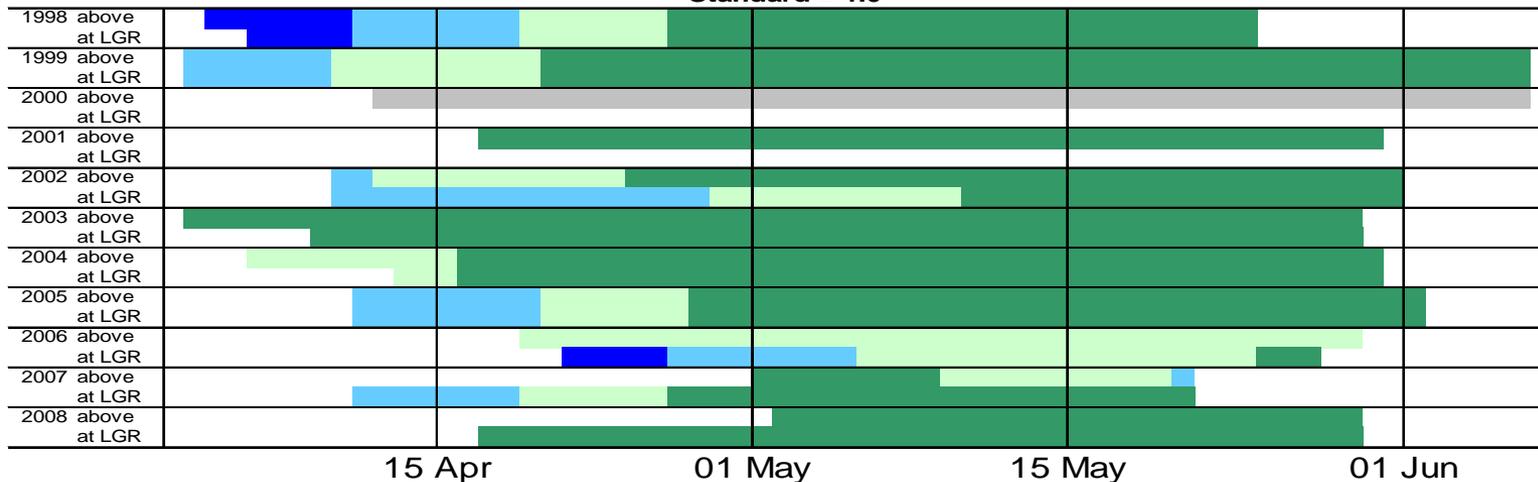


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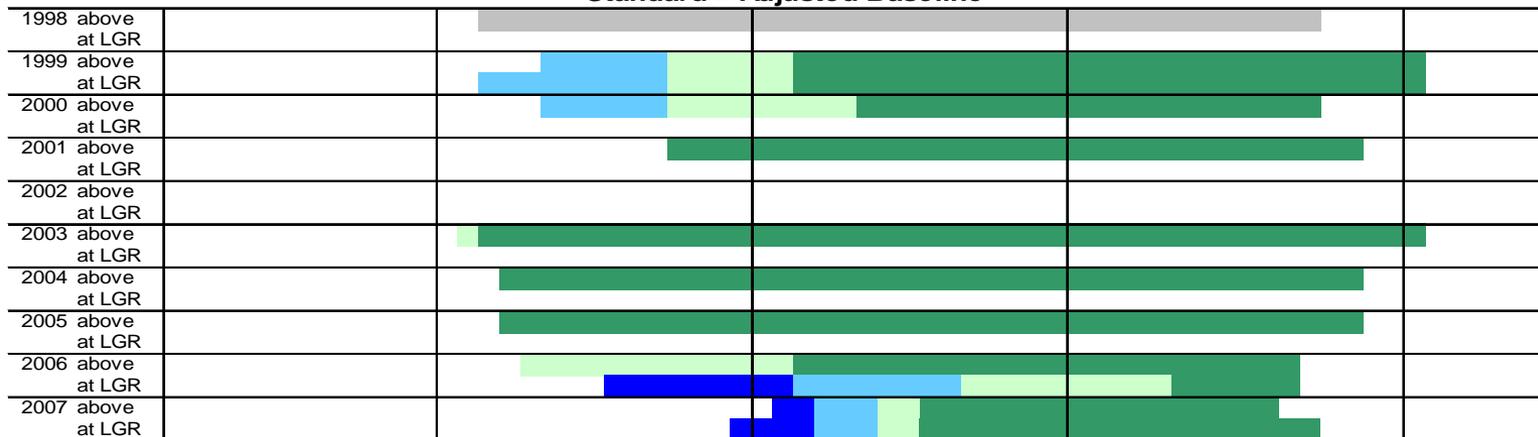


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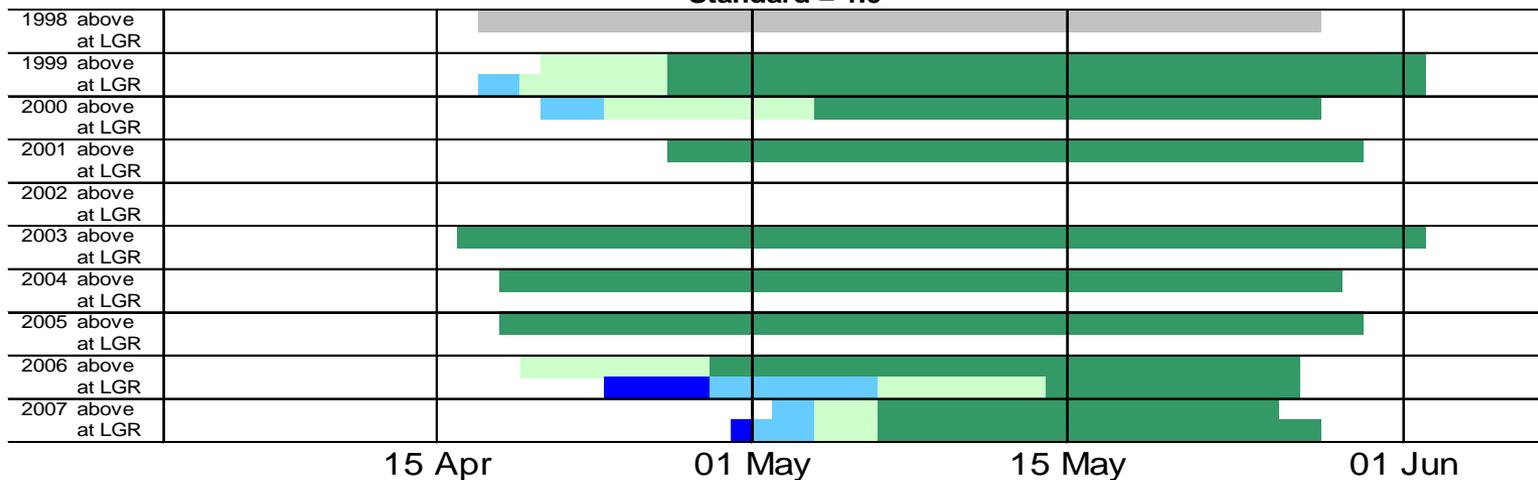


Hatchery Steelhead - Transportation from Lower Granite Dam

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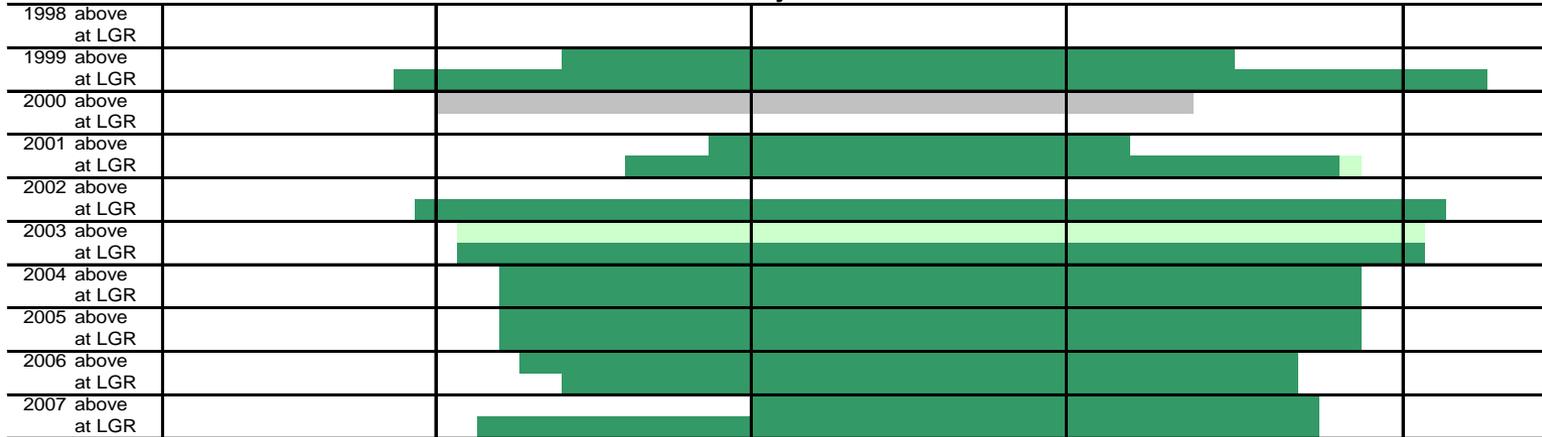


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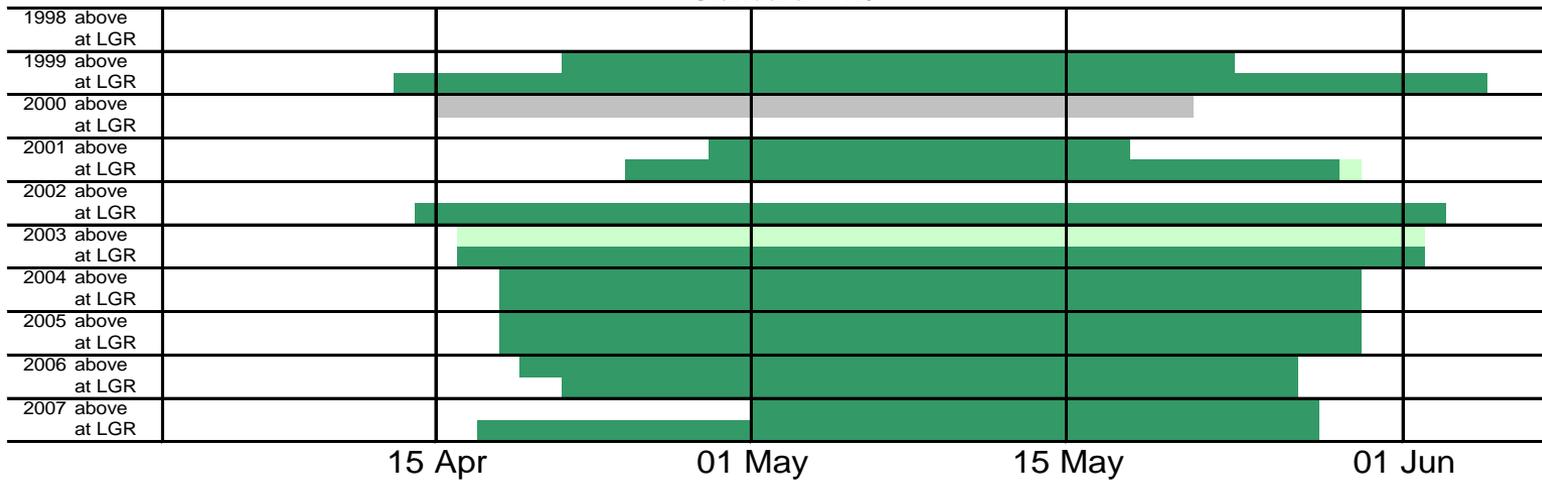


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- Wild steelhead: Transport SAR always significantly greater than in-river.

(one exception: data-poor 2000)



Bottom Line

Recent operations have improved performance of migrants and lessened differences in SARs between transports and migrants with a transport benefit occurring later in the season

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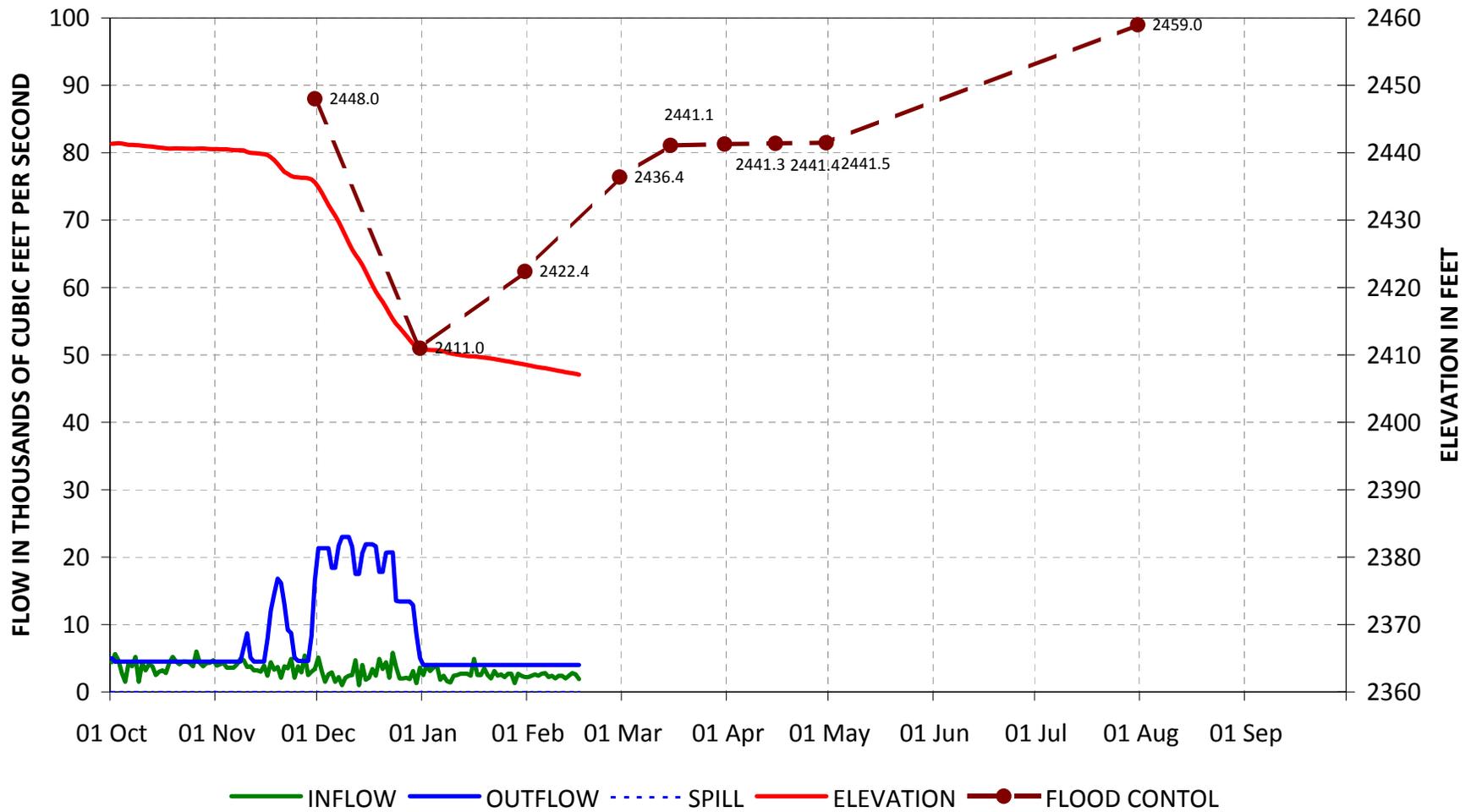
Recent operations have improved performance of migrants and lessened differences in SARs between transports and migrants with a transport benefit occurring later in the season

However, transport still returns more adults for most stocks, especially later in the migration season, so transporting fewer fish in recent years has resulted in substantially fewer adult fish returning

Questions

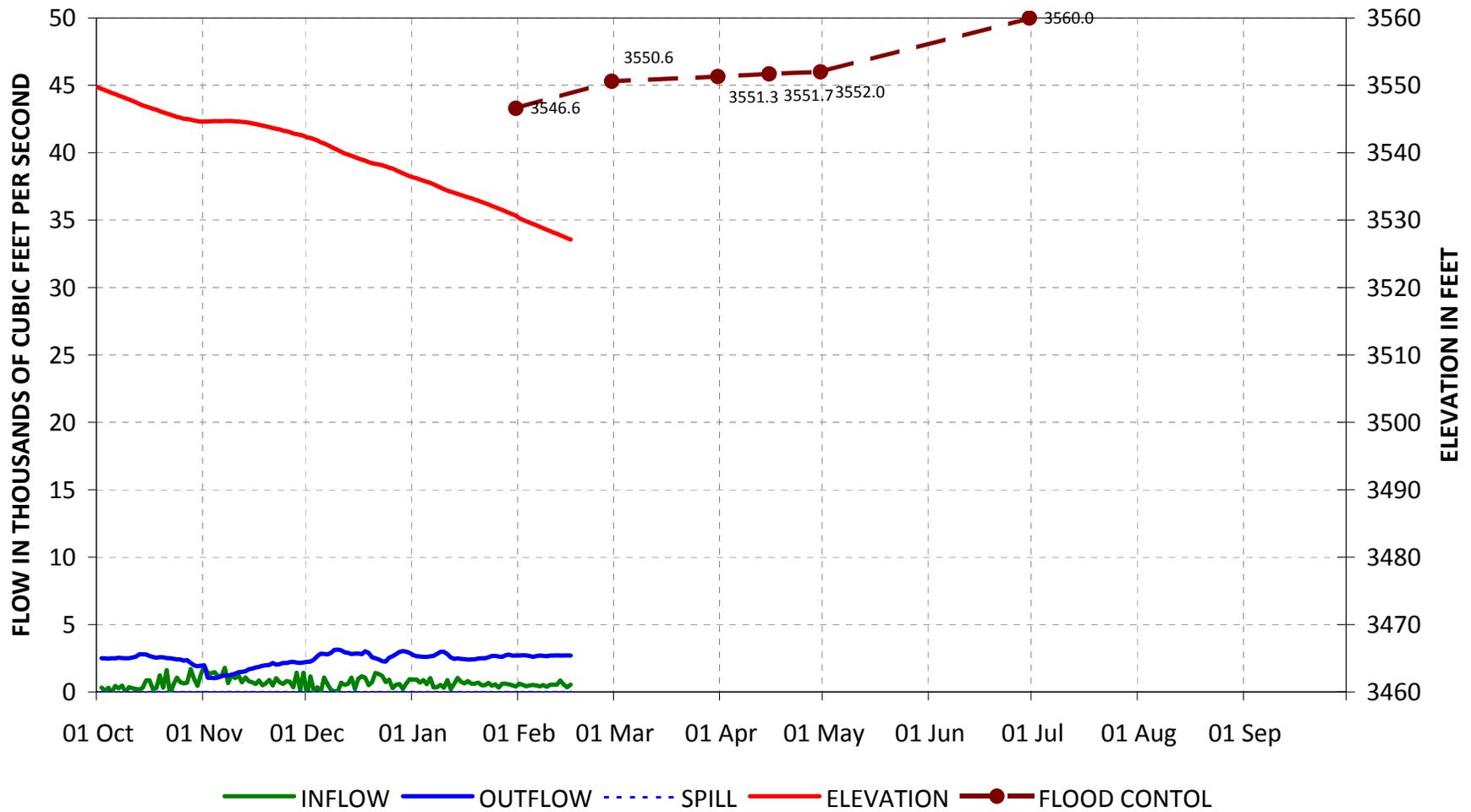
LIBBY DAM AND RESERVOIR

Water Year 2010



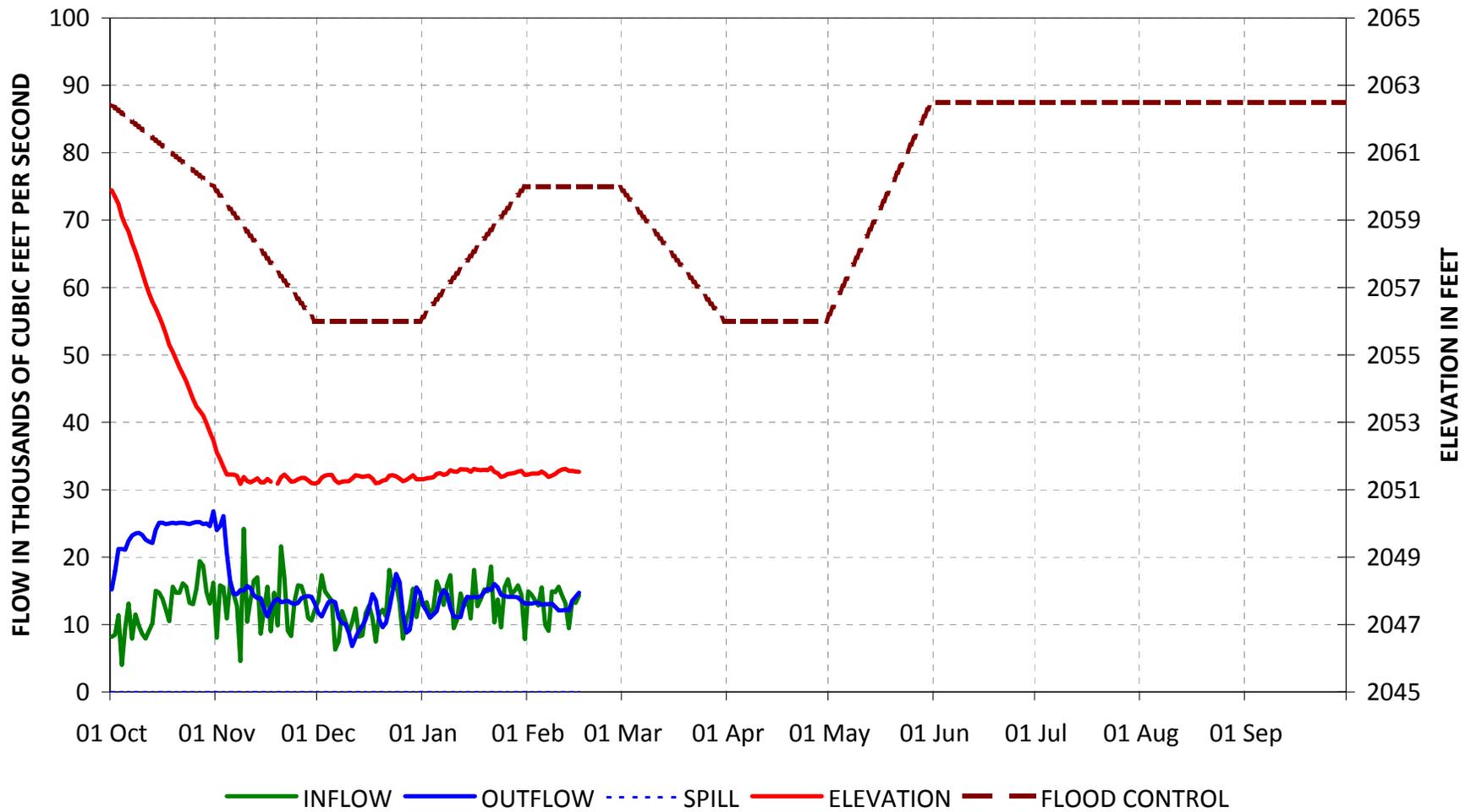
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



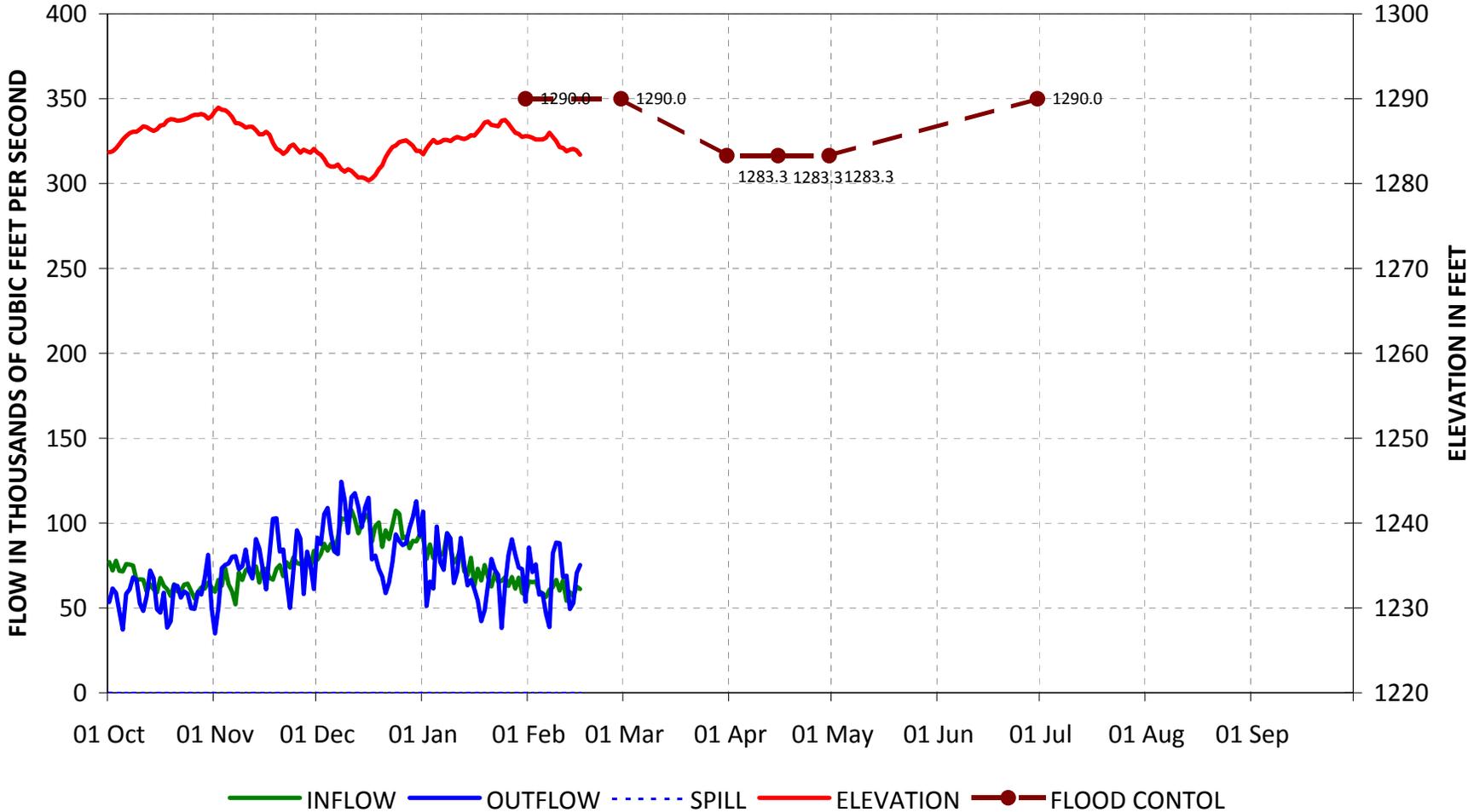
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



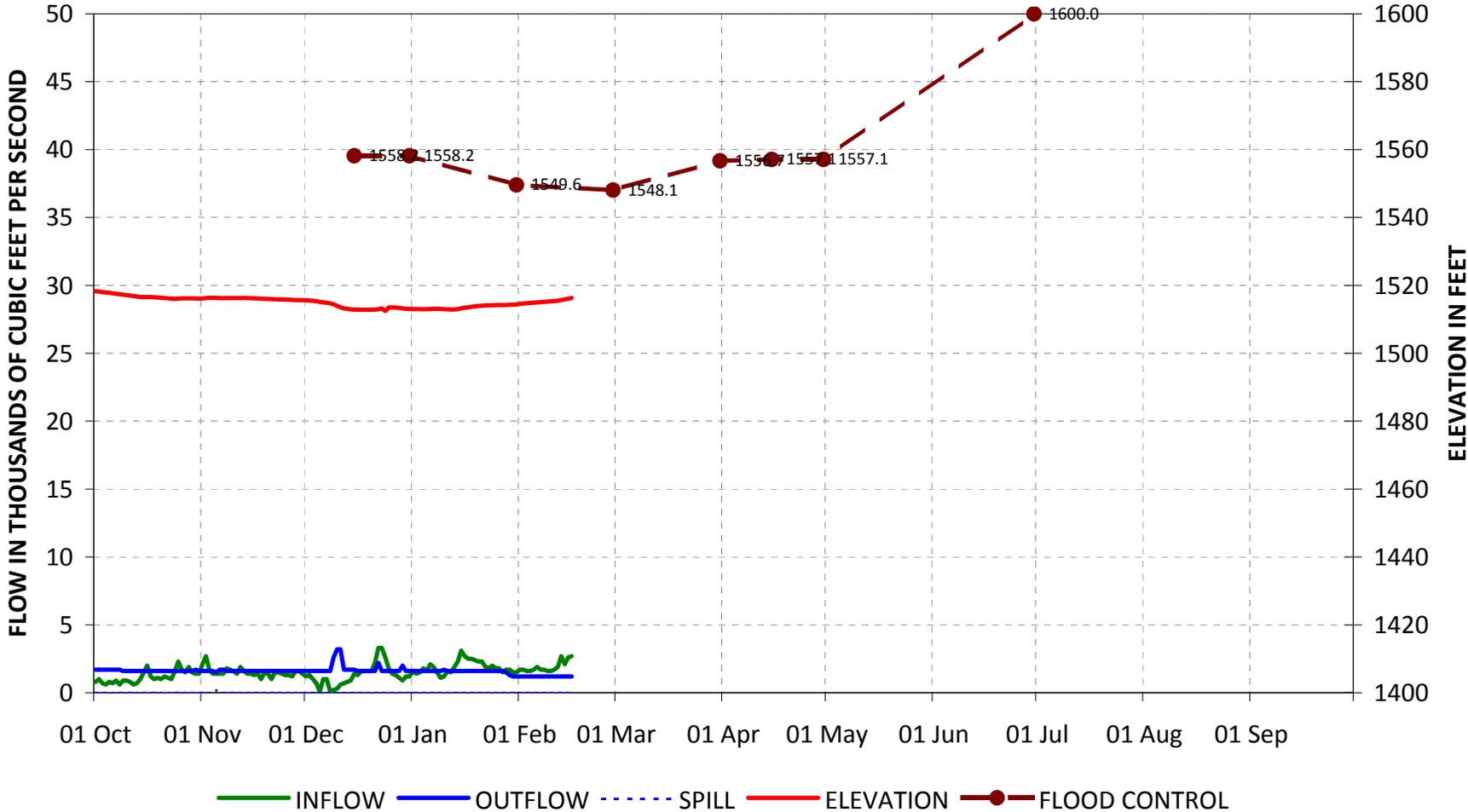
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



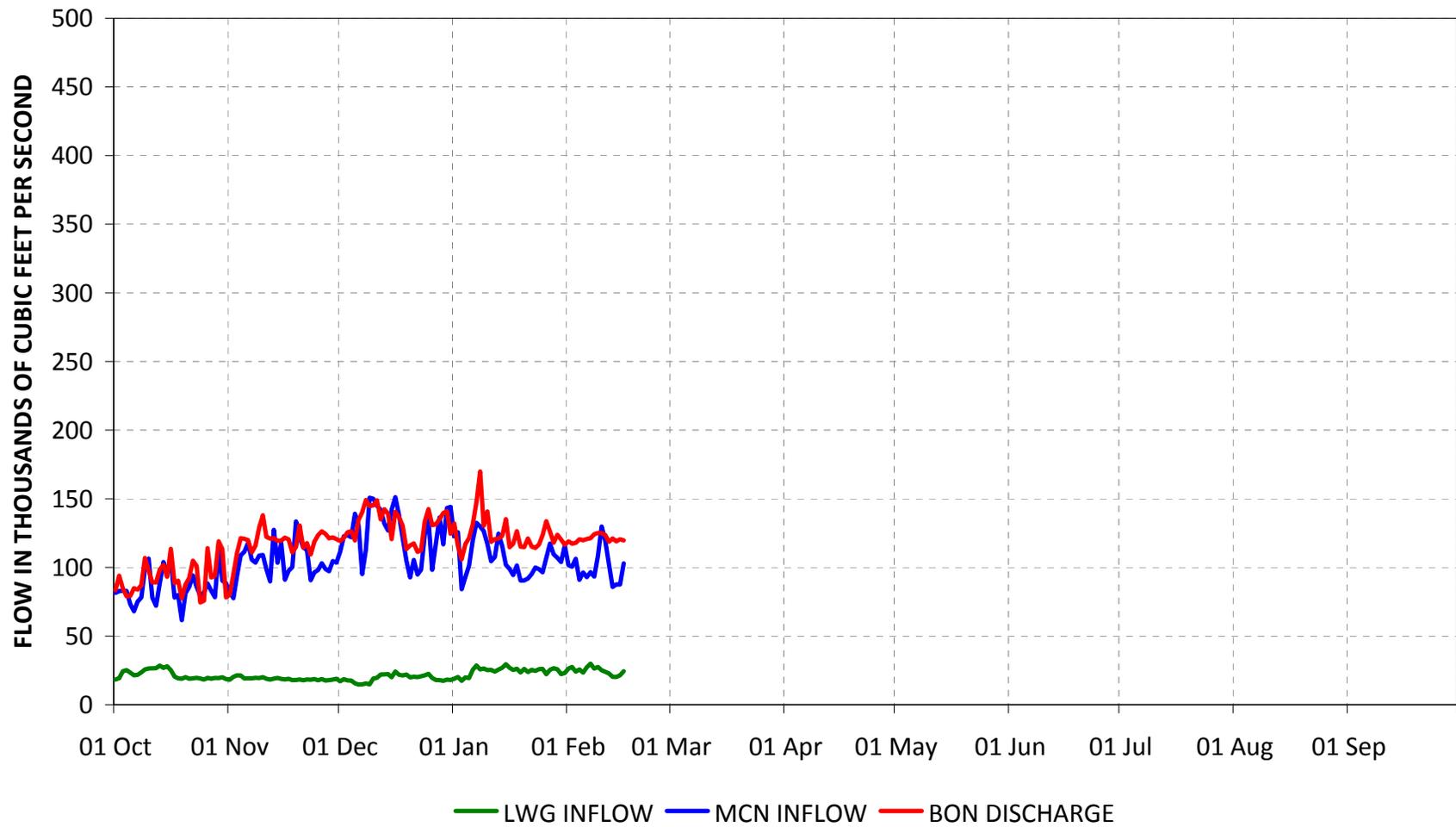
DWORSHAK DAM AND RESERVOIR

Water Year 2010



LOWER SNAKE AND LOWER COLUMBIA RIVER FLOWS

Water Year 2010



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

February 17, 2010 Meeting

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 for February 3, 2010

Kyle Dittmer, CRITFC, made a correction to page 5 of the official meeting minutes explaining that the agency he cited is known as the Australian Bureau of Meteorology, and was incorrectly recorded as the Australian Board of Meteorology. Corrections will be made and posted to the web site. There were no other comments or changes to either the facilitator's notes or the official meeting minutes and both sets are considered final.

The Dalles Spillwall Update

Steve Barton, COE, explained to TMT that section 14 of 15 of the Dalles spillwall is currently being set, and that the project is expected to be completed in mid-March, two weeks early. He also noted that TDG modeling will be ongoing.

2010 Operations/ Updated Weather and Flood Control Forecasts

Steve Barton, COE, directed TMT to data posted as a link to the agenda that detailed precipitation in the region. With the exception of areas in the Olympic Mountain range, the water supply is much below normal levels, specifically 60% of normal for February. The mid-month update is due out on Friday 2/19 and is projected to verify the data currently available.

Kyle Dittmer, CRITFC, discussed the current El Nino conditions and noted that they have strengthened since his last report. He referred to graphs (not posted to the agenda) tracking various temperatures. Data reported by NOAA currently shows near normal sea surface temperatures off the Oregon/Washington coast and predictions indicate that warming should peak in May. Given this, a fair amount of precipitation is still a possibility for the spring.

Discussing flood control, Barton directed meeting participants to the flood control link on the TMT site. He explained that Duncan is the only project at flood control target and that the rest of the projects are discharging project minimums, below flood control for the season. Barton noted that the historical Initial Control Flow (ICF) value is in the mid 300's and that the current ICF is 238.

Action/Next Steps: Updates on this issue will continue to be discussed at all TMT meetings in the near future.

Water Management Plan Spring/Summer Update

Steve Barton, COE, explained that a draft Spring/Summer update to the WMP is expected on 3/1 and that the final draft will be due 5/15. He committed to emailing TMT members when the draft is posted and ready for review and comments. Paul Wagner, NOAA, asked if the draft will be in the usual format. Barton answered yes, unless there are suggested changes. He further noted that the COE is open to all ideas to improve the document as they want it to be as useful a tool as possible.

Action/Next Steps: TMT will revisit this topic at the 3/3 TMT meeting.

FOP Update

Steve Barton explained that while changes to the Fish Operations Plan are still being made, the COE is working diligently to share a draft of the plan soon. He said he expects a draft to be available in mid-March and that he will bring it to TMT as soon as possible.

Operations Review

Reservoirs: Libby was at elevation 2407.09', with inflows of 1.9 kcfs (averaging 2.4 last week) and outflows of 4 kcfs. Albeni Falls was at elevation 2051.53', passing inflows of 14.7 kcfs. Dworshak was at elevation of 1516.31' with inflows of 1.7 kcfs and outflows of 1.1 kcfs. McNary average flows were 102.9 kcfs and Bonneville average flows were 120 kcfs (operating at chum minimum). Grand Coulee was at elevation 1283.4', operating to meet both the chum tail water below Bonneville Dam and the Vernita Bar protection flows, currently drafting about .5' per day. Hungry Horse was at 3527.13' with outflows of 2.7 kcfs (78% of normal water supply forecast for February).

Fish: Paul Wagner, NOAA, noted that the chum temperatures are following historic trends and that the salmon managers are hoping for early emergence. Timing will continue to be tracked and technical data will be shared with TMT at the next meeting.

Cindy LeFleur, WA, shared that, as of yet, no large fish have been observed in the system although some spring chinook have been caught in the Kalama and Woodland River fisheries.

Rick Kruger, OR, shared some findings regarding recent sturgeon kills at Bonneville. The fish appear to have sustained injury due to contact with the turbines and as a result, coordination has been done with operators to make adjustments to the B2 turbine. He explained that a protocol has been submitted for inclusion in the Fish Passage Plan, which would initiate a 'slow roll' operation when turbines are down for any length of time. Discussions will be ongoing between Oregon, Washington and BPA on how to address this issue.

Power System: Tony Norris, BPA, had nothing to report on the power system, however, he did mention that the current El Nino conditions are negatively impacting wind generation.

Water Quality: Laura Hamilton, COE, had no water quality issues to report.

Other: Steve Barton, COE, advised TMT members and attendees that the COE security clearance list has expired and is being rebuilt. The list is being pared down to the current group participants. They can expect to be contacted by security to confirm their on-going participation. This exercise will be repeated annually.

RIOG Briefing

TMT was briefed by four members of the Regional Implementation Oversight Group (RIOG): Kate Puckett, Bureau of Reclamation; Holly Hardwood, BPA; Rock Peters, COE; and Ritchie Graves, NOAA. Rock shared a historical review of how RIOG came to be, as an outgrowth of the court-mandated Policy Work Group, and clarified that the group was convened to support and ensure implementation of the 2008 BiOp and its associated performance standards. The purpose of today's presentation was to share RIOG guidance on dispute resolution procedures for the technical teams, and how the teams intersect with RIOG. Rock clarified that RIOG's intent is not to change the important role TMT plays in day-to-day operations management, nor to usurp any decision-making authority held by a single agency. Several supporting documents were posted as links to the TMT agenda, outlining procedures for the groups' interactions and conflict resolution and included a Point of Contact spreadsheet.

Holly Hardwood referred TMT to page 3 of the '2010 Hydro Dispute Resolution Procedures' document posted as 8(a) to the TMT agenda. It detailed a flow chart showing two pathways through the decision making process designed to resolve long and short-term issues.

Suggestion: A TMT member suggested that when polled on an issue, the choices for technical team members should include the option of 'no objection' as has been the protocol for TMT in the past. This would allow all parties more flexibility in providing input on any given issue.

Question: Are non-listed salmonid species addressed by the RIOG? **RIOG:** RIOG members need to understand the interactions of all species with salmonids and this should play a role in decision-making. So yes, RIOG does discuss non-listed salmonid species.

Question: How are disputes under other BiOps, e.g. the 2000 and 2006 USFWS FCRPS BiOps, addressed within the RIOG process? **RIOG:** As they interface with NOAA's FCRPS BiOp, they should be addressed within the RIOG process.

Kate Puckett shared that "adaptive management" as it relates to the 2008 NOAA BiOp is a formal framework described in the Adaptive Management Implementation Plan and the BiOp for how to fold new information into decision making around changes to the RPAs in the BiOp. This would happen through annual progress reports as well as the 2013 and 2016 check ins. Adaptive management, she said, is distinct from 'in-season flexibility' that TMT is concerned with.

Question: What is the process for raising adaptive management issues? **RIOG:** These issues should be raised through RIOG members and the Senior Hydro Team. Changes to the BiOp ultimately would need to be sanctioned by NOAA.

Ritchie Graves, NOAA, will convene the Senior Hydro Team in March, and will serve as Chair for that group. It was clarified that, unlike IT, the senior technical teams will not serve a dispute resolution function, but will help identify and frame issues and will play an integral role in long range planning. Ritchie encouraged the technical teams to resolve issues at their own levels and stressed the importance of having close relationships with and open lines of “vertical” communication between themselves and RIOG members.

The RIOG members were thanked for providing feedback to TMT on the RIOG process, and they thanked TMT for the valuable work they do to support the overall regional effort of implementing the BiOp.

Action: Katherine Cheney, RIOG coordinator, will send Steve Barton updates to the RIOG Point of Contact list as they are available.

NOAA Transport Studies

Bill Muir of the NOAA Science Center walked TMT through several graphs summarizing the Science Center’s analyses of juvenile chinook salmon and steelhead transport from Lower Granite and Little Goose dams from 1998-2008. The presentation focused on background information; data including weekly mean flow and spill for the 10 most recent years; addressed dams with surface bypass, percent of fish survival given transportation, predation and travel time; and impacts of the use of PIT tagged fish and sample size. He noted that 2009 was one of the best years for travel time on the Snake River. He answered questions from TMT members regarding the gathering, calculating and plotting of study information. He concluded by saying that while recent operations have decreased the difference in SARs between in-river migrants and transported fish, transportation for most fish produces a higher SAR, especially later in the season. See Bill’s summary and report for details on the analyses; both are posted as links to the agenda.

TMT Schedule – NOTE: TMT will meet weekly during the month of March. The next TMT meeting will be: **face-to-face on 3/3 at 9:00 am at the Division COE conference room.**

Agenda items will include:

- Notes Review
- The Dalles Spillwall Update
- 2010 Operations- Updated weather and flood control forecasts
- Water Management Plan Spring/ Summer Update
- FOP Update
- Chum emergence timing
- Emergency Actions
- Operations Review

**Columbia River Regional Forum
Technical Management Team Meeting
February 17, 2010**

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting) with representatives of Montana, Washington, Oregon, Idaho, USFWS, COE, BOR, BPA, NOAA, CRITFC and others participating. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at the meeting. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for February 3, 2010

Kyle Dittmer (CRITFC) pointed out that "Australian Board of Meteorology" should be "Australian Bureau of Meteorology" in section 4 of the official notes. There were no other comments on meeting notes today.

3. The Dalles Spill Wall Update

Little has changed since the last progress report to TMT, Barton said. Spill wall construction is still ahead of schedule, with completion expected in mid-March if all goes well. The contractor is working now on section 14 of 15.

4. 2010 Operations – Updated Weather and Flood Control Forecasts

a. Weather. Barton showed TMT a map, linked to today's agenda, that depicts snow pack across the Columbia basin. All areas are significantly drier and warmer than normal, with the exception of the Olympic range of northern Washington and western Montana along the continental divide. Canadian sites that were previously showing normal snow levels have dropped to below normal, with the exception of one site in the far north of Canada.

The February mid-month forecast just released validates the February final forecast, which was 74% of normal for The Dalles Dam; 65% of normal in the Snake basin; and 81% of normal at Grand Coulee Dam. Water supply predictions are now 67% of normal for The Dalles; 67% of normal above Ice Harbor Dam; and 59% of normal at Grand Coulee Dam.

Dittmer then gave an update on ocean conditions, which are also indicative of a low water supply. According to the multi-variable ENSO chart, the El Nino warming trend has gotten stronger at a time of year when it should be dying off. The ENSO index tracks SOI, seas surface temperatures, sub-ocean temperatures and sky conditions. The last time El Nino strengthened like this was 1957-58. However, there's some good news on the horizon. There are pockets of

colder water and rain off the coast and no indication of temperature patterns associated with El Nino. Conditions for spring migration could still be favorable.

b. Flood Control. Barton showed TMT the latest flood control elevation targets for each project, based on February final water supply forecasts for Libby and Dworshak dams. (These calculations are posted on the TMT web page as item 3 under water control data.) The only project currently above its end of February flood control elevation is Duncan Dam in Canada, which is also the only project above its April flood control elevation. The Initial (flood) Control Flow (ICF) this year is 238.1 kcfs, which is very low. A typical ICF is in the mid-300s.

Dittmer asked whether it would be possible to trigger refill before April 30, given these low flow conditions. That's uncertain at present, Barton replied. Tony Norris (BPA) emphasized there's zero flood control draft available at Grand Coulee from March 30-April 30. TMT will be tracking the region's water supply forecasts and flood control targets closely at upcoming meetings.

5. Water Management Plan – Spring/Summer 2010 Update

The COE is working on a draft, due to be posted to the TMT website by March 1, with the final WMP spring/summer update due May 15, Barton said. The plan for 2010 spring/summer operations is very susceptible to change based on updated weather and water forecasts. The COE will notify TMT members when the draft WMP spring/summer update is available for review. Meanwhile, TMT can discuss how best to structure the review process. Norris noted that updates are generally considered living documents, open to change throughout the season. TMT will revisit this issue at its next meeting March 3.

6. Fish Operations Plan Update

The FOP should be available for review by mid-March, Barton said. On the TMT page, a link under Reservoirs gives passage numbers for all projects.

7. Operations Review

a. Reservoirs. Grand Coulee is at 1283.4 feet which is pretty close to near the April 10 flood control elevation – drafting about half a foot per day to meet the minimum chum tailwater elevation of 11.5 feet. Bonneville tailwater has been kept within half a foot of the target elevation almost every hour, Norris noted, and it is forcing draft from Grand Coulee to meet that requirement. Passing only inflows at this time would dewater the chum redds. The current situation is an example of how the chum requirement drives the entire river operation. Inflows at Grand Coulee have been averaging 60 kcfs for the past 15 days, which is about what's needed to provide flows at Vernita Bar. At this point there is little remedy to save water for other fish requirements in April, May and June without dewatering chum. Furthermore, if Brownlee Dam is required to fill to its flood control elevation at some point, that water would result in lower Snake and Columbia River flows.

Based on the latest STP projections, Grand Coulee reservoir will barely hit 1,283 feet while providing water for chum and Vernita Bar, John Roache (BOR) said. Water temperatures at Bonneville have been tracking close to the historical temperatures for chum incubation, which means emergence at the end of March, or half a foot of water per day from Grand Coulee for the next 45 days, Paul Wagner (NOAA) said. The system is well below the threshold where TMT needs to consider tradeoffs in Grand Coulee operations, Norris said. TMT will address this at its next meeting March 3.

Hungry Horse is at elevation 3,527.13 feet, with discharges of 2.7 kcfs to meet the Columbia Falls minimum flow of 3,411 cfs based on the final February forecast. If the March forecast drops, the Columbia Falls minimum flow will drop even further, with the lowest possible flow at 3,200 cfs. Libby is at elevation 2,407.09 feet with average inflows of 2.4 kcfs, discharging minimum flows of 4.0 kcfs as it has all year. Albeni Falls is at elevation 2,051.53 feet, passing inflows of 14.7 kcfs. Dworshak is at elevation 1,516.31 feet, with inflows of 2.7 kcfs, mainly from precipitation, and discharges of 1.2 kcfs.

Seven-day average inflows are 24.4 kcfs at Lower Granite; 102.9 kcfs at McNary; and 120 kcfs at Bonneville to maintain the 11.5-foot tailwater for chum.

b. Fish. Chum temperature accrual is following historic trends, Wagner said, although early emergence is still possible. Battelle placed temperature arrays in the chum spawning area and has been following this closely. Wagner offered to provide the Battelle reports at the next TMT meeting to aid in discussion of the tradeoffs involved in maintaining the chum operation.

The Washington sturgeon fishery ended yesterday, and a few early spring Chinook have been caught, Cindy LeFleur reported. Rick Kruger (Oregon) showed TMT photos of sturgeon found dead in the boating restricted zone at Bonneville Dam. This week 12 fish were killed, with injuries characteristic of turbine blades. Two weeks ago, FPOM discussed the recurrent phenomenon, and project staff offered to modify turbine start-up protocols. As of February 16, any turbine down for 12 hours or more will be started up gradually in a procedure called a “slow roll.” Apparently, sturgeon have been getting inside the turbines and resting on the blades. Project staff also instituted protocols to close the wicket gates so fish can’t enter turbines from upstream. The COE has made this change permanent by adding it to the Fish Passage Plan, but it won’t stop sturgeon from entering a turbine from downstream. Fish agencies and FPOM plan to collaborate on other measures to block downstream access. Kruger said the situation is being handled well and the COE has been very responsive. He asked TMT members to tell their field crews to notify project staff of any sturgeon kills as soon as possible so they can be investigated.

c. Power System. The El Nino effect has caused a drop in wind generation, Norris reported.

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

8. RIOG Briefing

Rock Peters (COE), Holly Harwood (BPA), Kate Puckett (BOR), and Ritchie Graves (NOAA) gave TMT a presentation on RIOG's role and the dispute resolution process RIOG is developing. The process is open to input from the technical teams, and the best way to communicate with RIOG is via a RIOG representative. RIOG meets next on March 11.

a. RIOG's role in the region. Peters began with a description of how RIOG was formed. The Regional Oversight Implementation Group is an outgrowth of the Policy Work Group (PWG) that dealt with issues over a 3-year period during the 2008 BiOp remand process. PWG members wanted to continue working together on BiOp issues in collaboration with sovereign parties as the region moves toward full BiOp implementation. RIOG's main function is to implement the 2008 BiOp while addressing issues and concerns raised by the sovereign parties.

A top priority is meeting BiOp performance standards for hydro and habitat. To accomplish that, RIOG's process is linked to that of other groups such as the Council, but RIOG's role is not to disseminate information. The central role of RIOG is BiOp implementation.

The role of the senior technical teams – such as the Senior Hydro Team chaired by Ritchie Graves (NOAA) – is to respond to RIOG's requests for information and prepare briefing materials for RIOG. Senior technical teams for hydro, habitat, hatcheries and harvest are forming now. RIOG intends to maintain TMT and SCT, as well as the other technical teams and committees such as AFEP, FFDRWG and SRWG, as integral to BiOp implementation. There's also a continued need for O&M committees to ensure that the federal projects are operated as intended for fish.

RIOG will serve as an advisory policy forum for the region, not a decision-making body. All final decisions rest with the agency that has statutory authority. RIOG's procedures and guidelines – including the dispute resolution process outlined in the 5 attachments linked to today's agenda – are open to refinement.

To monitor progress toward full BiOp implementation, federal action agencies will develop annual progress reports on actions taken in the previous year. These reports will highlight actions that worked well or didn't work, and the applied to the adaptive management process. With its focus on resolution of long-term issues, RIOG isn't oriented toward the type of short-term, in-season management decisions TMT makes. RIOG anticipates the technical teams will participate in development of new processes and procedures to improve system performance. RIOG also anticipates that the technical teams will be actively involved in the comprehensive checklists of 2013 and 2016 to measure how well the various ESU's are doing. Questions and answers on RIOG's role followed:

- *How is RIOG pronounced?* REE-og.
- *Will the public have access to RIOG meeting information via a website?* There are no plans for a public forum at this time. The best access to RIOG is through a RIOG member. The Senior Hydro Team and other H-teams will have public websites and TMT's site will continue to be public.

b. Dispute Resolution Process. Holly Harwood (BPA) described the procedures for dealing with short- and long-term disputes (shown in the chart on page 3 of the dispute resolution procedures attached to today's agenda). In general, RIOG expects the hydro technical teams such as TMT and SCT to try to resolve issues at the working level. To resolve a dispute, the chair polls the sovereigns to get their views and clarify areas of disagreement. If the technical team is not able to resolve an issue, there are two potential ways to elevate it:

(1) Short term issues – These issues require a decision within 2 weeks. The federal agency with statutory authority will make the decision based on input from the technical team and notify the team and RIOG of the decision and its rationale in a timely manner. If a technical team member disagrees with the decision, they should confer with their RIOG representative. If the two agree there's a problem, they should ask the Senior Hydro Team to address it.

Questions and answers on short-term issues followed:

- *When TMT representatives are polled on an issue, one option has routinely been to vote "no objection" instead of simply abstaining. Will this continue to be a choice? That's useful feedback, and RIOG will consider it (as of now, the choices are "yes," "no" and "abstain"). Future questions like this can be referred to RIOG via a RIOG representative.*
- *Do the RIOG dispute resolution procedures pertain strictly to listed salmonid species? The first step is to ensure that one's RIOG representative understands the interactions between species. Is it within the purview of the dispute resolution process to consider issues that affect both listed and nonlisted species? Yes, it's appropriate to raise operational issues that affect multiple species.*
- *In the past, TMT worked as a group to frame the terms of a dispute as part of the resolution process. Now that's up to the individual TMT member, right? Yes, if it's a short-term issue. A TMT member who is dissatisfied with an agency decision can go to their RIOG representative, who will refer the issue to the Senior Hydro Team Chair if also unsatisfied, Harwood said. There is no defined role for RIOG or the Senior Hydro Team in short-term decisions, but the process is flexible enough to allow discussion at the senior technical team level if necessary, Graves added.*

- *Will RIOG and the technical teams working on BiOp implementation follow the 2006 USFWS BiOp and other BiOps, or just the 2008 FCRPS BiOp?* RIOG will review all operations and the BiOps that pertain to them together. For the most part, the FCRPS BiOp recognizes other BiOps and incorporates key ingredients of the other BiOps. All the BiOps are intended to be implemented together, Harwood said.
- *Will these dispute resolution procedures apply to disputes over other BiOps, and will other BiOps be subject to this implementation process?* There's no requirement to use a different methodology for other BiOps. However, if there's an interaction between the FCRPS BiOp and another BiOp, it's good business to notify the Senior Hydro Team, Graves said.

(2) Long-term issues – These issues are more typical of SCT's role in planning system configuration improvements years in advance. If the technical team (i.e. SCT) can't resolve a long-term issue, the chair will simultaneously refer it to the Senior Hydro Team chair, the RIOG chair and the RIOG coordinator for review. The senior technical team will discuss the issue and prepare a briefing paper for RIOG. Before referring an issue to a senior technical team, the technical team working on the issue should define it in writing. A template for preparing RIOG briefing materials is attached to this agenda item.

Harwood pointed out that the Senior Hydro Team is not intended to be a dispute resolution forum, as IT was. Its primary role is refinement of issues for RIOG to consider in making a recommendation to the agency with statutory responsibility. There were no questions today on the procedures for resolving long-term issues.

c. Adaptive Management. Kate Puckett (BOR) discussed the meaning of adaptive management. The term is being used in a number of ways, but in relation to the FCRPS 2008 BiOp it has a specific definition. Adaptive management allows for formal changes to a Reasonable and Prudent Alternative, a rigid structure that isn't open to change by any individual team or agency. Literally, adaptive management means the process by which an RPA may be altered if it becomes reasonable to do so. Such alterations would arise from the annual agency progress reports and be referred to RIOG. If RIOG and NOAA agree the new information warrants changing an RPA, the change will be formally clarified.

By contrast, in-season management operates within the RPA structure. In-season flexibility is based on annual variations in runoff, weather and fish runs, which is not the same as adaptive management. Questions and answers on adaptive management followed:

- *Who takes on the task of resolving adaptive management issues, the technical team as a whole or an individual member? Will adaptive management issues be referred to RIOG? Adaptive management issues will come from many different sources, notably annual progress reports. Some of this information will reach RIOG. If a technical team identifies a desired operational change to an RPA, they can work through their RIOG representatives to get the request on RIOG's agenda. Any substantive changes to RPAs must be sanctioned by both RIOG and NOAA.*
- *Does the FCRPS point of contact list attached to today's agenda contain up-to-date information? It's up to date but not complete, as some sovereigns haven't designated their representatives yet. The updated contacts list will be posted to the TMT web page.*
- *What will be the timing of RPA-based changes in the hydro management cycle? Will agency progress reports recommend changes to be implemented the following year? Production of agency progress reports is frequently delayed for inclusion of the latest scientific findings. Often the COE must wait until September to gather all pertinent information for its annual report. There's no clear answer to this dilemma beyond a conscious effort to keep reporting cycles as current as possible.*

When the sovereigns have all identified their Senior Hydro Team members, Graves will convene a kickoff meeting, probably in March 2010. Graves encouraged TMT to keep up its good work in service to the region, to do its best to resolve disputes at the TMT level, and to write up any unresolved issues for the Senior Hydro Team to consider. Good communication between technical team members and their RIOG representatives is essential.

9. NOAA Transport Studies

Bill Muir (NOAA Science Center) gave a presentation on conditions for transported vs. in-river fish in recent years. The analysis, attached to today's agenda and posted on the NOAA web site, is 100 pages of mostly graphs. The transport studies looked at how operational changes have affected juvenile survival and travel time in terms of smolt to adult return rates, and how those rates compare with SARs for juveniles bypassed and returned to the river.

The studies don't identify an optimal date for the start of transportation. ISRP's recommendations on this issue are to continue current operations until adults have returned and data are available, which is beginning to happen.

Study Variables: Flow conditions for migration have varied widely in recent years. The year 2008 was one of high flows, and in 2007 low flows resembled 2001, the lowest year on record in the region's water supply. Spill levels were high in 2006, a year of average flows, and in 2007 and 2008. The opposite was true in 2001 (zero spill) and 2005 (no spill until the end of the season). Another variable has been the staggered start of transport in recent years, based on

temporal information from the ongoing transport studies. Seven of 8 projects now have surface collectors, which affect travel time and possibly survival rates. The combination of spill conditions and delaying the start of transport meant a smaller percentage of fish were transported in recent years.

Graphs of survival rates from Lower Monumental to McNary dams and of travel times from Lower Granite to Bonneville dams show big differences in travel times between 2007, a low-flow year, and 2001, when spill was turned off completely. As a result of the staggered start of transportation, juvenile Chinook salmon survival is over 50%, the highest rate seen in recent years. The same is true for steelhead, particularly in 2009 when steelhead survival rates were around 70%. Steelhead have fared well in recent years, with improved travel times in 2007 compared to the low-flow years of 2001 and 2004.

Lower Granite Dam Study: For the past 4 years, the Science Center has been focusing its efforts on the effects of transport at Lower Granite Dam. Once a week before passage season begins, researchers PIT tag all the wild steelhead and wild Chinook they can collect on a barge, then return them to the river. Although sample sizes were often small, the study provides useful information on fish tagged above the dam. The study didn't include never-detected fish because researchers won't be able to track them adequately until more projects have detectors installed in the spill bays. Nor did the study include effects of increased straying rates that may result from transport. Bypassed fish that were detected and returned to the river are the core of this analysis. In some years, findings were based on small numbers of adult returns. Adult returns for 2007-08 are not complete, and there's no data yet for 2009.

The study provided daily estimates of SARs for four groups of smolts, including fish tagged above Lower Granite and at the dam itself. Counts of PIT-tagged smolts in each group in relation to the number of adults that came back yielded the SARs estimates. The study used a regression model for each species in each migration year to identify daily SAR rates for transported and non-transported fish. (Weekly SARs are presented in the charts for the sake of clarity.) From the SARs ratio came a TM ratio that compares survival rates of transported vs. in-river fish. Estimates with a ratio greater than TM1 indicate that transported fish returned as adults at a higher rate. Estimates with a ratio less than TM1 indicate that in-river migrants had higher adult return rates than transported fish.

Dave Statler (Nez Perce) asked if the reason non-detected fish weren't included was so researchers could focus on daily returns; Muir said yes. To account for that variable, researchers devised an alternative standard that measures differences in SARs for detected fish vs. those put back in the river. If a TM ratio exceeds the alternative standard, the findings apply to the run at large, not just in-river migrants. The study also includes confidence intervals.

A graph comparing historic findings showed that, in most cases, the TM ratio has been brought down by improving survival rates and travel time for in-

river migrants. Graphs of SARS for hatchery Chinook, wild Chinook, hatchery steelhead (no data available for early season migrants), and wild steelhead are combined on one page for each species.

Study Findings and Conclusions: The transport analysis section of the NOAA report presents findings for each ESU for each year for fish transported vs. those tagged and released above Lower Granite Dam. Quite often the SARs were lower for fish released at Lower Granite than transported fish, but in some years they are similar. Conclusions of the transport analysis were:

- Transported fish generally didn't do as well as in-river fish early in the season, but their survival rates improved as the season went on.
- Conditions were poor for fish left in the river in 2001, a very low flow year with a high TM ratio. Conditions in 2007 were better, with spill provided at surface collectors. Improvements in survival rates over 2001 were observed for hatchery Chinook and wild and hatchery steelhead.
- Sample sizes for the wild tagged fish were small.
- The analysis was intended to describe patterns in available data, not identify a date for the start of transport.
- For all the years studied, TM ratios either remained constant or increased through the season.
- Pre-2006 SARs were greater for fish transported after May 1.
- For 2006-08, TM survival rates first exceeded the alternative standard in late May, a reflection of better in-river travel times.
- The average TM ratio was lower in 2006-08 than in 1998-2005, but SARs for transported fish were still higher than for in-river fish in most cases.
- SARs for transported wild steelhead were significantly higher than SARs for in-river wild steelhead.
- Recent operations have improved the performance of in-river migrants and lessened the disparities in SARs, with the benefits of transport occurring later in the season. However, transport still returns more adults for most stocks, especially late in the migration. Transporting fewer smolts in recent years has led to substantially fewer adults returning.

Comments and Discussion: Russ Kiefer (Idaho) preferred the term "transport/bypass ratio" to "in-river migrants" to avoid confusing these fish with migrants that pass through turbines and surface weirs. In 2001, when there was no spill and maximum transport, there were virtually no undetected fish going through the system, Muir said. By contrast, in 2007 when spill aided passage despite low flows, an estimated 60% undetected fish passed the collector dams (excluding Lower Granite, Little Goose or Lower Monumental). The adjusted standard for wild Chinook passage at Lower Granite showed a 2-3% difference in transported vs. non-transported spring Chinook, but up to a 30% difference for transported vs. non-transported steelhead.

Kiefer asked why the modeling indicates a 95% confidence that transported fish did better in late April, yet the data don't show transported fish

did better until May. Others made that observation, so the study author is using a different model now, Muir replied.

Tables showing SARs for individual years would be helpful, Jim Litchfield (Montana) commented. They would make it easier to estimate adult returns under different scenarios. There are other tradeoffs the study didn't consider, such as increased steelhead survival, potential effects on lamprey, effects in the John Day and Deschutes rivers, and a lack of data for sockeye, Muir said.

A total annual summary would be informative in future years when sample sizes get bigger, Cindy LeFleur (Washington) commented. Also, it would help to have separate graphs for April and May. LeFleur found the weekly data informative, but the sample sizes were too small.

Litchfield asked whether the study accounts for tagging bias. Muir said no, but tagging bias is assumed to be equal for the transported and bypassed fish.

Dave Statler (Nez Perce) asked whether it would be possible to compare SARs for bypassed and in-river migrants. Annual SARs are misleading for comparing the two groups, Muir replied. Statler wants to see a direct comparison of survival ratios for non-bypassed in-river fish and transported fish.

Wagner wondered how the study findings could be applied to adaptive management. How will the findings influence recommendations for change? When the improvements we've made in river operations raise the in-river survival rates, the relative benefits of transportation will decline by comparison, Kiefer said. According to IDFG research, predators consume a smaller proportion of in-river migrations, and these are more likely to be injured or sick fish that won't return as adults. When more fish are transported, those left in-river are more vulnerable to predation, and predators are more likely to consume fish that could have returned as adults.

TMT wrestles most with the question of whether to put bypassed fish back in the river, rather than whether to transport all fish, Litchfield observed. Another question TMT wrestles with is whether to do the best thing for steelhead or gather more information on sockeye, Kiefer observed. Sockeye migration occurs when transport most benefits steelhead.

9. Next Meeting

The next regularly scheduled TMT meeting will be on March 3. The agenda will probably resemble today's, with an update on The Dalles spill wall construction; planning for spring 2010 operations; a WMP spring/summer update; a status report on the Fish Operations Plan spring/summer update; chum emergence; Grand Coulee operations; and the emergency actions list. This summary prepared by technical writer Pat Vivian.

Name

Affiliation

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Jim Litchfield	Montana
Cindy LeFleur	Washington
Dave Wills	USFWS
Rick Kruger	Oregon
Doug Baus	COE
John Roache	BOR
Tony Norris	BPA
Paul Wagner	NOAA
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Russ George	WMC
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Tim Heizenrader	Centaurus
Steve Hall	COE Walla Walla
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WDFW : Cindy LeFleur **MT** : Jim Litchfield / Brian Marotz
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday March 3, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

To check into the building, take the elevator to the 5th floor and the guard will issue you an ID badge if you need one and will take you down to the meeting room on the 4th floor. If you have NOT attended a TMT meeting in the past contact Steve Barton (503) 808-3945 so you can be added to the TMT Visitor List and issued an ID badge. This badge may be used indefinitely. If you have attended TMT in the past you may re-use your ID badge indefinitely. If you are a federal employee you will also need to have an ID badge issued to you which can be used indefinitely.

**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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for February 17, 2010 [\[Meeting Minutes\]](#)
3. The Dalles Spillwall Update - Steve Barton, COE-RCC
 - a. [Photo 1](#)
 - b. [Photo 2](#)
 - c. [Photo 3](#)
4. 2010 Operations/Updated Weather and Flood Control Forecasts - Steve Barton, COE-RCC
 - a. [Westwide SNOTEL](#)
5. Water Management Plan Spring/Summer Update - Steve Barton, COE-RCC
6. Chum Emergence Update - Paul Wagner, NOAA Fisheries
 - a. [Ives Data](#)
 - b. [Ives Map and Totals 2009](#)
7. 2010 Operations - Steve Barton, COE-RCC

8. Transport Update - *Paul Wagner, NOAA Fisheries*
 - a. [ISAB Review](#)
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 10, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

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

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

NOAA's "Low Flow" Transport Operations Proposal

Request for ISAB Review by NOAA Fisheries

February 25, 2010

Background

The Independent Scientific Advisory Board (ISAB) recommended, in their Snake River Spill-Transport Review (ISAB 2008-5), that "whenever river conditions allow during the late April-May period, a strategy allowing for concurrent transportation and spill is prudent."

Consistent with that recommendation, the federal Action Agencies (U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and Bonneville Power Administration) have operated the Snake River collector projects (Lower Granite, Little Goose, and Lower Monumental dams) during 2006-2009 in accordance with court-ordered spring spill/transport operations. This operation has resulted in considerably fewer fish being transported during the spring migration period than has occurred in past years with similar seasonal flows. 2007 was a low flow year in which seasonal spring flows averaged about 61 kcfs (see Figure 1). Adult returns from juveniles out-migrating in 2007 (which are incomplete as not all 2-salt steelhead and no 3-salt steelhead or 3 or 4-salt spring summer Chinook salmon have returned to Lower Granite Dam) indicate that while the Transport to Inriver Migrant (T:M) ratio were less than in previous years with similar flows, they were, nonetheless, still positive and substantial (NWFSC 2010; FPC 2010) – especially so in May for wild Chinook and steelhead (NWFSC 2010 - Appendix A, Figures A10 and A32; Appendix B, Figures B10 and B32).

In addition to the available SAR information we have considered potential negative impacts to other species and the potential benefits of recently installed fish passage structures to the survival of future in-river migrants. We have considered potential impacts of slightly increased (3-5%) wandering/straying rates of transported SR steelhead into Mid-Columbia steelhead habitat. We have considered concerns regarding the effects of transport on SR sockeye salmon and Pacific lamprey, but are unaware of any credible scientific data currently available that can be used to evaluate whether or not transport is detrimental to these species, or that would indicate the magnitude of impact. We have also considered whether or not ESUs/populations are covered by "safety-net" hatcheries and the relative strengths and listing status of the various species.

Based on our consideration of the available information, we conclude that continuing the court ordered spill/transport operations in low-flow years like 2007 would result in substantial losses (in terms of adult returns) of wild SR steelhead and spring/summer Chinook salmon relative to maximum transport operations under these environmental conditions. The likely impacts to wild Snake River steelhead and spring/summer Chinook populations from continuing court-ordered spill/transport operations in a low flow year exceed the likely or potential impacts of maximum transport operations to the other species considered above.

NOAA Fisheries acknowledges it would be desirable to obtain additional information on the performance of recently installed passage structures in a low flow year, but believes that the risk is not justified if flows will be similar to those of 2007. NOAA Fisheries believes that it would be prudent to forego the spread-the-risk spill transport operations when expected river flows are forecasted to be ≤ 65 kcfs at Lower Granite Dam¹ and instead maximize transport (provide no voluntary spill) at the Snake River collector projects (beginning no later than May 1 at LGR, May 5 at LGS, and May 8 at LMN and ending when fall Chinook salmon outnumber spring migrants for three consecutive days²). Spill operations at the other mainstem projects would be unaffected by the spill/transport operations for the Snake River collector projects.

Question for the ISAB

Taking into account the ISAB's 2008 recommendation "*whenever river conditions allow during the late April-May period, a strategy allowing for concurrent transportation and spill is prudent,*" NOAA Fisheries looked at the data from the 2007 low-flow year and determined that if flow conditions in 2010 were similar to 2007 (i.e., ≤ 65 kcfs), it would not be "prudent" to continue spilling water in May at the three collector projects as in 2007.

Question: Has NOAA Fisheries correctly interpreted the ISAB's recommendation? If not, please further explain your reasoning in the 2008 recommendation.

Summary of 2007 Operations, River Flows, and Transport Rates

In 2007, Snake River flows at Lower Granite Dam averaged 61 kcfs during the spring migration season, 24 kcfs lower than the 85 kcfs spring flow objectives (Figure 1). Spill operations at the three Snake River collector projects in 2007 were targeted at 20 kcfs – 24 hours per day (LGR), 30% of daily flows – 24 hours per day (LGS), and "gas cap" resulting in spill volumes between 15 and 30 kcfs – 24 hours per day (LMN). These spill operations in a low flow year resulted in relatively high spill levels compared to other recent years. For example, the Fish Passage Center estimated that the average seasonal spill levels were nearly 38% in the LGR to McNary Dam Reach in 2007 (estimated using FPC 2010, table 7). As a consequence, far fewer fish (17-47%) were collected and transported (Table 1) and more fish migrated in-river than in previous years – especially compared to those characterized as low flow years.

¹ Expected seasonal flows are initially based on the April final forecast (available in early April), but will be updated in-season using either the May early-bird forecast (available in late April) or the May final forecast (available in early May).

² The actual start of summer spill will be initiated when subyearling Chinook exceed 50% of the collection for a 3-day period for each Snake River project after June 1.

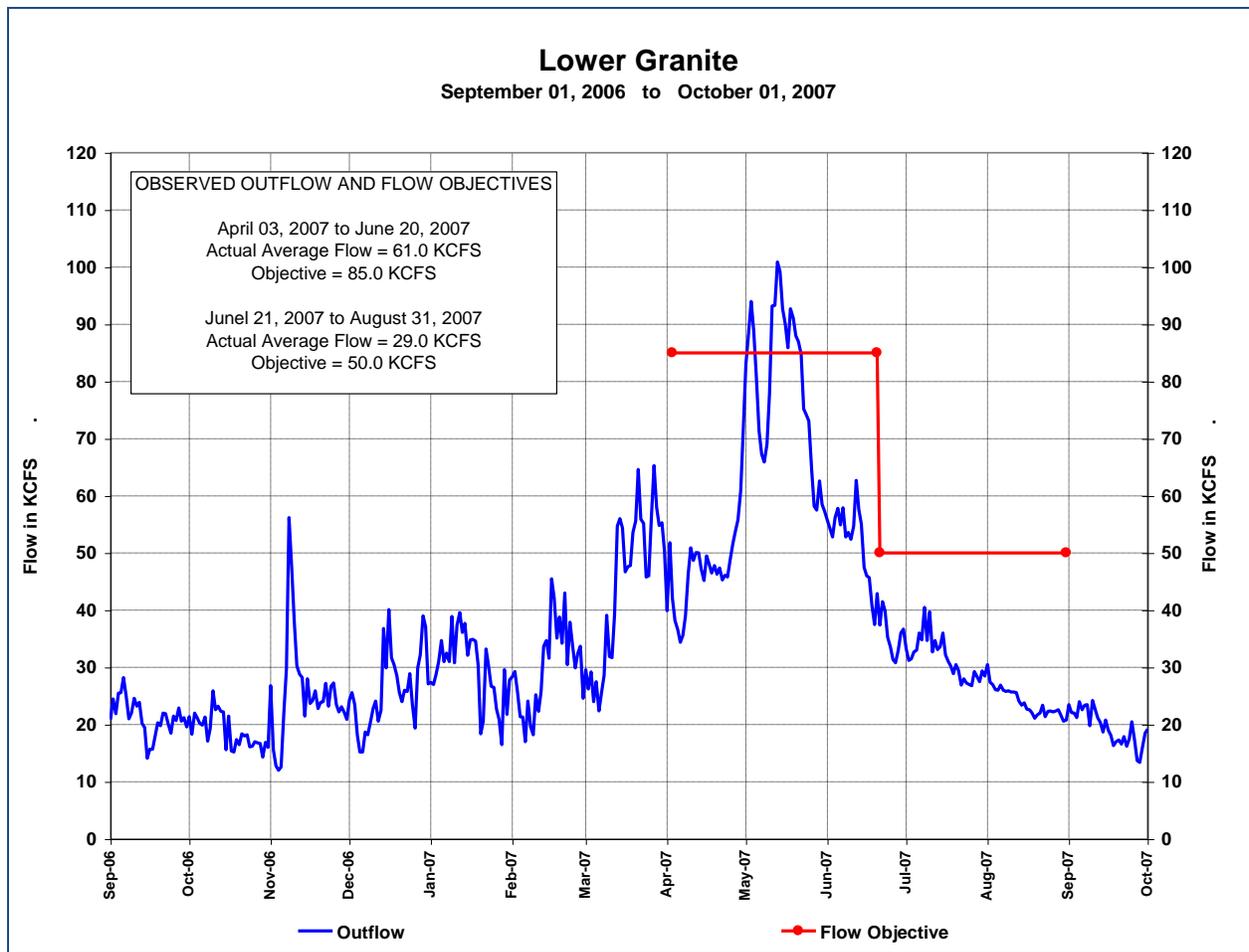


Figure 1. Observed outflows and flow objectives at Lower Granite Dam (2007 Water Year). Source: Presentation by Cathy Hlebechuk (COE) to Technical Management Team 2007 Year End Review – Nov. 28, 2007).

Table 1. Estimated percentage of juvenile Snake River steelhead and spring/summer Chinook salmon (wild and hatchery) transported in 2007.

Species	NWFSC Estimate (NWFSC 2010 – Table 1)	FPC Estimate (FPC 2010 – Table 4)
Wild SR Steelhead	41.1%	43.7%
Hatchery SR Steelhead	41.1%	47.0%
Wild SR spr/sum Chinook	24.8%	16.8%
Hatchery SR spr/sum Chinook	25.4%	24.2%

Summary of Smolt to Adult Return Information from 2007 Juvenile Migration

Northwest Fisheries Science Center Paper

The NWFSC report (2010) analyzed patterns of SARs relative to in-season migration timing of smolts.³ SARs of juvenile fish transported at either LGR or LGS were compared to SARs of non-transport fish⁴ that migrated through the lower Snake and Columbia Rivers. In 2007, T:M ratios at LGR significantly exceeded 1.0 (and the adjusted standard⁵) for wild Chinook salmon starting in late April (for fish released at LGR) or early May (for fish released above LGR). Significant transport benefits continued throughout May for fish released at LGR, but were not statistically significant for fish released above LGR after about May 8 (NWFSC 2010, Figure 2). The T:M ratios of wild steelhead released both above and at LGR significantly exceeded both 1.0 (and the adjusted standard) throughout the entire migration season. Similar, though somewhat delayed, patterns of T:M ratios were observed for fish released at LGS (NWFSC 2010, Figures 6 and 8).

Close inspection of the weekly SAR estimates for wild spring/summer Chinook (NWFSC 2010 - Appendix A, Figure A10 and Appendix B, Figure B10) indicates that inriver SARs declined across the month of May for fish released above LGR, at LGR, or at LMN. Transport benefits (T:M ratios < 1.0 or the adjusted standard) consequently became substantial in early May at LGR, and as soon as transport began (second week of May) at LGS. For wild steelhead, SARs of inriver migrants released above LGR peaked from late April to mid-May; but were generally exceeded by transport SARs throughout the month of May. SARs of migrants released at LGR or LGS declined throughout May, and were also substantially exceeded by the SARs of transported fish throughout May (NWFSC 2010 - Appendix A, Figure A32 and Appendix B, Figure B32).

Fish Passage Center Memorandum

The Fish Passage Center Memorandum (2010) focuses primarily on critiquing the NWFSC's methodologies and makes a case that improving in-river conditions has led to improvement of in-river survival. It does not focus on the specific low flow conditions that are expected in 2010. It also presents annual estimates of T:M SAR ratios⁶ (adult returns from fish that were transported compared to inriver migrants released upstream of LGR that were not detected at the three Snake River collector projects) for 2007 consistent with the methodologies used in the

³ Adult returns of steelhead and spring/summer Chinook salmon from the 2007 outmigration are not yet complete.

⁴ Within season analysis of SAR information requires that fish detected passing the collector projects be used to define the in-river migrant (M) group. Thus, these results are not directly comparable to seasonal averages using undetected fish (FPC 2010 analysis) because detected fish often have lower SARs than undetected fish. The NWFSC (2010) report attempted to correct for this difference by calculating an alternative "standard" for comparing SARs of transported and in-river migrating groups.

⁵ The 1.0 standard was adjusted upward to account for the higher SAR rates typically observed for undetected fish compared to those detected in the juvenile bypass systems at the Snake River collector projects.

⁶ Comparative Survival Study uses TIR (Transport vs Inriver Migrant) as its nomenclature.

Comparative Survival Studies. The annual T:M SAR ratio in 2007 was 1.15 for wild Chinook and 2.86 for wild steelhead.⁷

Management Conclusions from SAR Information

Based on the historic and 2007 SAR information presented by NWFSC and FPC, NOAA Fisheries believes that several conclusions can be drawn that are important for future spill / transport operations in low flow years. It is apparent that both Transport and In-river Migrant SARs (and the resultant T:M SAR ratios) vary across the migration season. Thus, average seasonal estimates of T:M SAR ratios do not provide sufficient information for designing flexible spill/transport operations aimed at balancing risks to, and increasing adult returns of, wild Chinook and steelhead. Also, it is clear that in low flow conditions such as 2007, SARs of wild transported fish, especially in May, are significantly and substantially higher than SARs of wild inriver migrants (either undetected fish, those released upstream of LGR, or those released at LGR or LGS).

NOAA Fisheries believes that improvements made to the FCRPS mainstem projects since 2007 (see section below) are not sufficient to improve in-river survival under low flow conditions to the extent necessary to substantially offset the observed pattern in T:M SAR ratios. Repeating the 2007 spill/transport operation in future low flow year places too great a risk on the wild SR steelhead and spring/summer Chinook populations as they would likely result in substantially fewer adults returning to the Snake River basin in subsequent years.

Other Considerations:

Other Species: MCR Steelhead, SR Sockeye Salmon, Pacific Lamprey

The ISAB rightly noted in their Snake River Spill/transport Review that other species may be, or are likely to be, affected by these operations. Transported SR steelhead typically wander/stray 3-5% more than adults that migrated in-river as juveniles (NOAA Fisheries 2008a and FPC 2010). These fish are often found in areas inhabited by Mid-Columbia River steelhead where they could interbreed and potentially affect the genetic integrity of some MCR steelhead populations. It has been hypothesized that transport negatively affects SR sockeye salmon. There is also some analysis which indicates that transportation rate has little influence of adult returns. However, as noted by the ISAB (2008), the data is presently insufficient to directly test T:M SAR relationships for SR sockeye salmon.⁸ Pacific lamprey – which are unlisted, though an important species of concern – could be negatively affected by spill/transport operations either directly (mortalities of transported lamprey or increased mortalities passing dams without spill) or indirectly (removing migrating salmon and steelhead through transport could increase mortalities from avian or fish predators). However, the likely magnitude of these impacts is unknown.

⁷ Adult returns of steelhead and spring/summer Chinook salmon from the 2007 outmigration are not yet complete.

⁸ A transport study for SR sockeye salmon has been planned for 2010 and will likely be supported again in 2011.

These considerations, along with information regarding the relative strengths of these ESUs / populations, whether or not they are covered by “safety-net” hatchery programs, and their ESA-listing status, are all important factors that NOAA Fisheries has considered in weighing risks and likely trade-offs between ESUs.

Configuration Changes: Surface Passage Structures Installed at LGS (2009), LMN (2008), and John Day Dam (2008) and Spill Wall at The Dalles (2010)

It is also true that the federal Action Agencies have made several fish passage improvements since 2007 which are expected to increase juvenile dam passage survival and could also slightly decrease delayed mortality of in-river migrants by reducing travel times through the mainstem migration corridor by many hours. These include the Adjustable Spillway Weir at Little Goose Dam, the Removable Spillway Weir at Lower Monumental Dam, two Temporary Spillway Weirs at John Day Dam, and the Spillway Wall in the tailrace of The Dalles Dam. NOAA agreed (NOAA Fisheries 2008b) with the federal Action Agencies (2007, Appendix B, Section B.2.1.2.2) that the likely survival improvement for juvenile yearling Chinook salmon and steelhead and from these structures would be about 1%, 2 to 4%, 1-4%, and 4%, respectively. It is unreasonable to think that these structures would fundamentally alter the T:M SAR ratios observed for outmigrants in 2007.

NOAA Fisheries' Conclusions

Based on the T:M SAR ratios from the 2007 outmigration, NOAA Fisheries concludes maximum transport operations are warranted in low flow years to protect wild SR steelhead and spring/summer Chinook salmon from likely, and substantial decreases in overall adult returns, even though other species - populations of MCR steelhead, SR sockeye, and Pacific lamprey may be negatively impacted to some unknown, degree. NOAA Fisheries further concludes that maximum transport operations should be confined to May, when the SARs of transported juveniles consistently return at higher rates than inriver migrants released at or above Lower Granite Dam.

NOAA Fisheries' Proposed Low Flow (≤ 65 kcfs at LGR) Operation

NOAA Fisheries proposes that an alternative spill/transport operation to the court-ordered operations for the Snake River collector projects in low flow years (≤ 65 kcfs at Lower Granite Dam).⁹ Normal spill operations would begin in early April consistent with the court-ordered operations at the three Snake River collector projects. Maximum transport operations (no spill and transportation of all smolts collected) would begin no later than May 1 at Lower Granite Dam, May 5 at Little Goose Dam, and May 8 at Lower Monumental Dam and continue for the duration of the spring migration period (until sub-yearling Chinook outnumber spring migrants

⁹ Expected seasonal flows are initially based on the April final forecast (available in early April), but will be updated in-season using either the May early-bird forecast (available in late April) or the May final forecast (available in early May).

for three consecutive days¹⁰ - which typically occurs in early June). After this time, court-ordered summer spill operations would begin for migrating juvenile SR fall Chinook salmon. TMT could recommend that maximum transport operations begin earlier than May 1 (or May 5 at LGS, or May 8 at LMN) based on in-season environmental and fish passage information.

Citations

Fish Passage Center (FPC). 2010. "Review of the NOAA Transportation analyses and potential effects of reducing spill for fish passage in May and beginning the transportation program earlier in the spring and supporting analyses." February 9, 2010 Memorandum.

Independent Scientific Advisory Board (ISAB). 2008. Snake River Spill-Transport Review: A scientific review of seasonal variation in the benefit of transportation of smolts from four Snake River Evolutionary Significant Units (spring/summer Chinook, steelhead, sockeye, and fall Chinook). September 16, 2008. ISAB 2008-5.

NOAA Fisheries – Northwest Regional Office (NOAA Fisheries). 2008a. Supplemental Comprehensive Analysis. May 5, 2008.

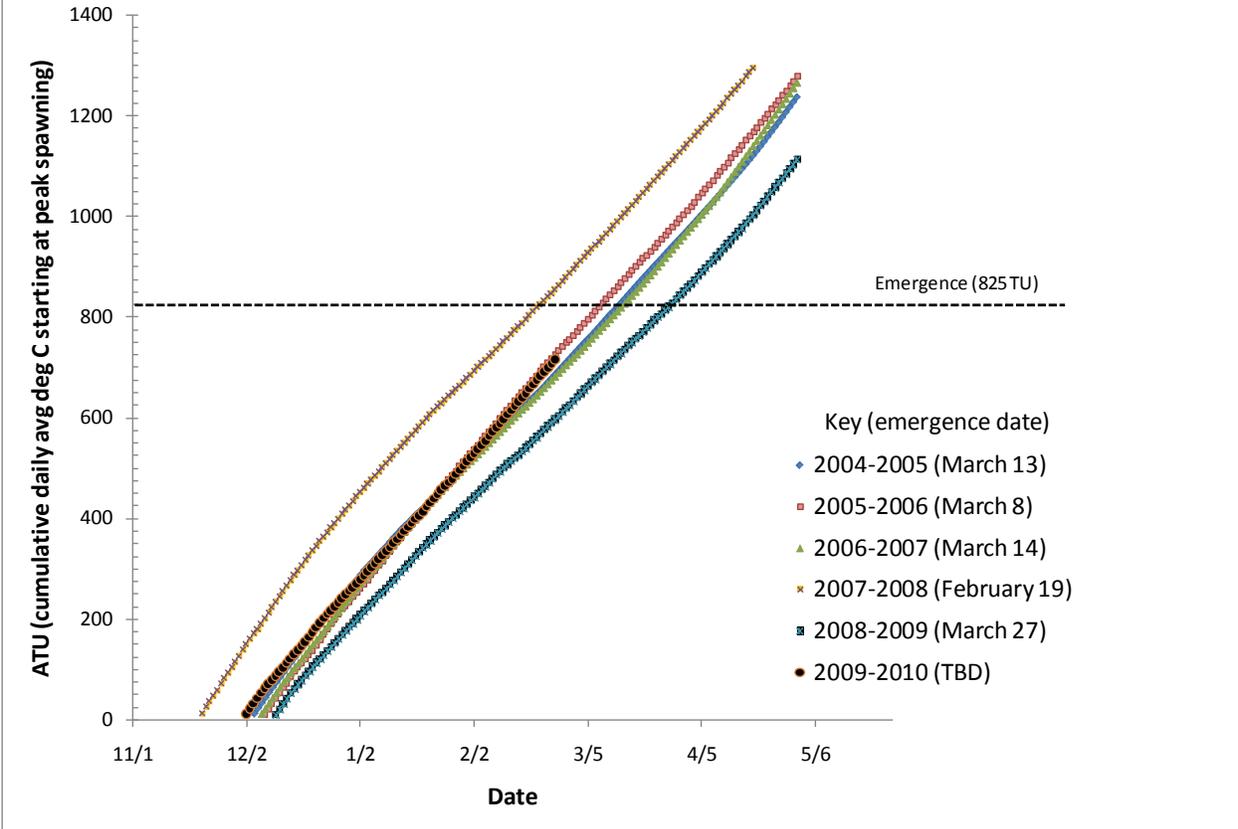
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NOAA-Northwest Fisheries Science Center (NWFS). 2010. Analyses of Juvenile Chinook Salmon and Steelhead Transport from Lower Granite and Little Goose Dams, 1998-2008. January 2010.

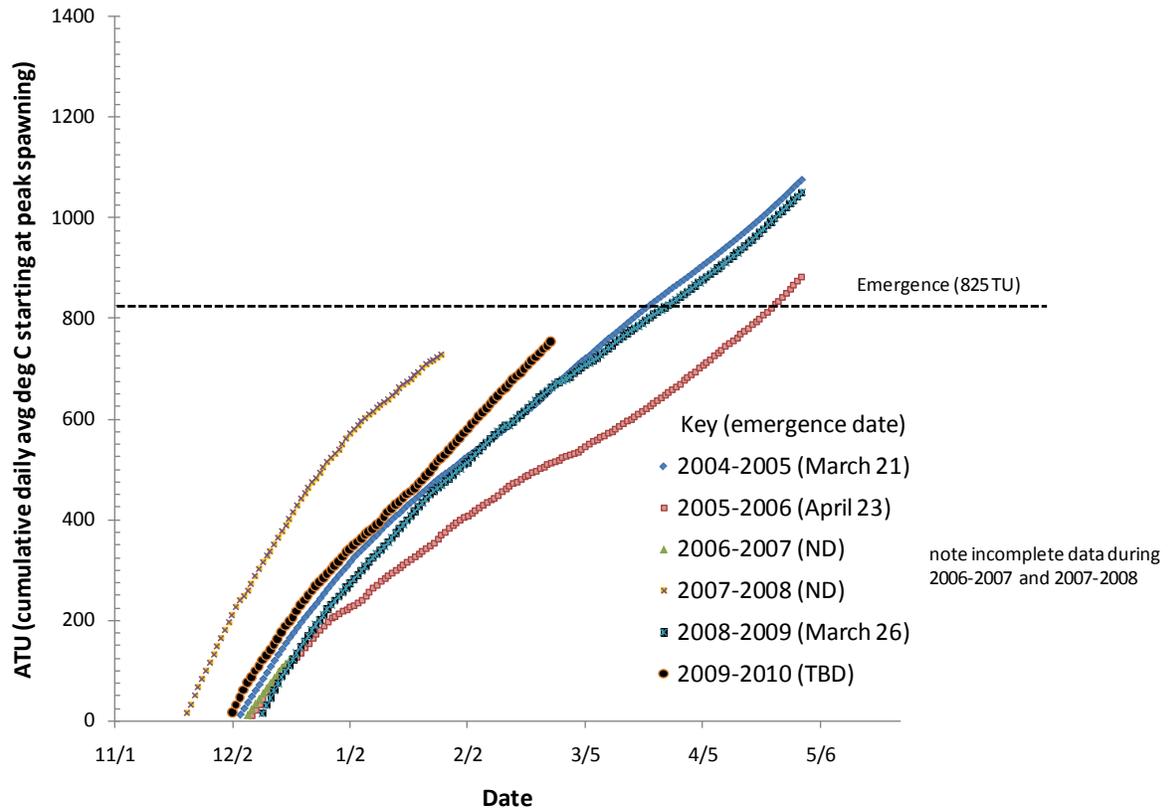
U.S. Army Corps of Engineers, Bonneville Power Administration, and U.S. Bureau of Reclamation (federal Action Agencies). 2007. Biological Assessment for Effects of Federal Columbia River Power System and Mainstem Effects of Other Tributary Actions on Anadromous Salmonid Species Listed Under the Endangered Species Act. August 2007.

¹⁰ The actual start of summer spill will be initiated when subyearling Chinook exceed 50% of the collection for a 3-day period for each Snake River project after June 1.

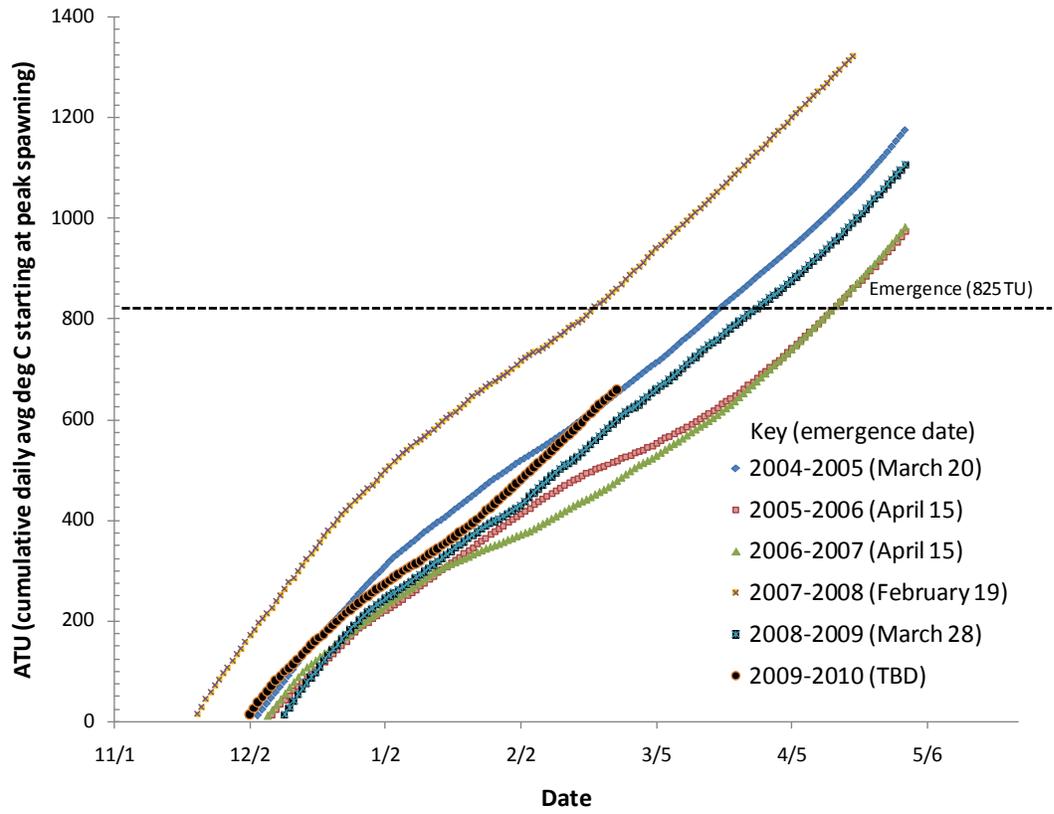
Ives 1 (2004-2010)



Ives 2 (2004-2010)

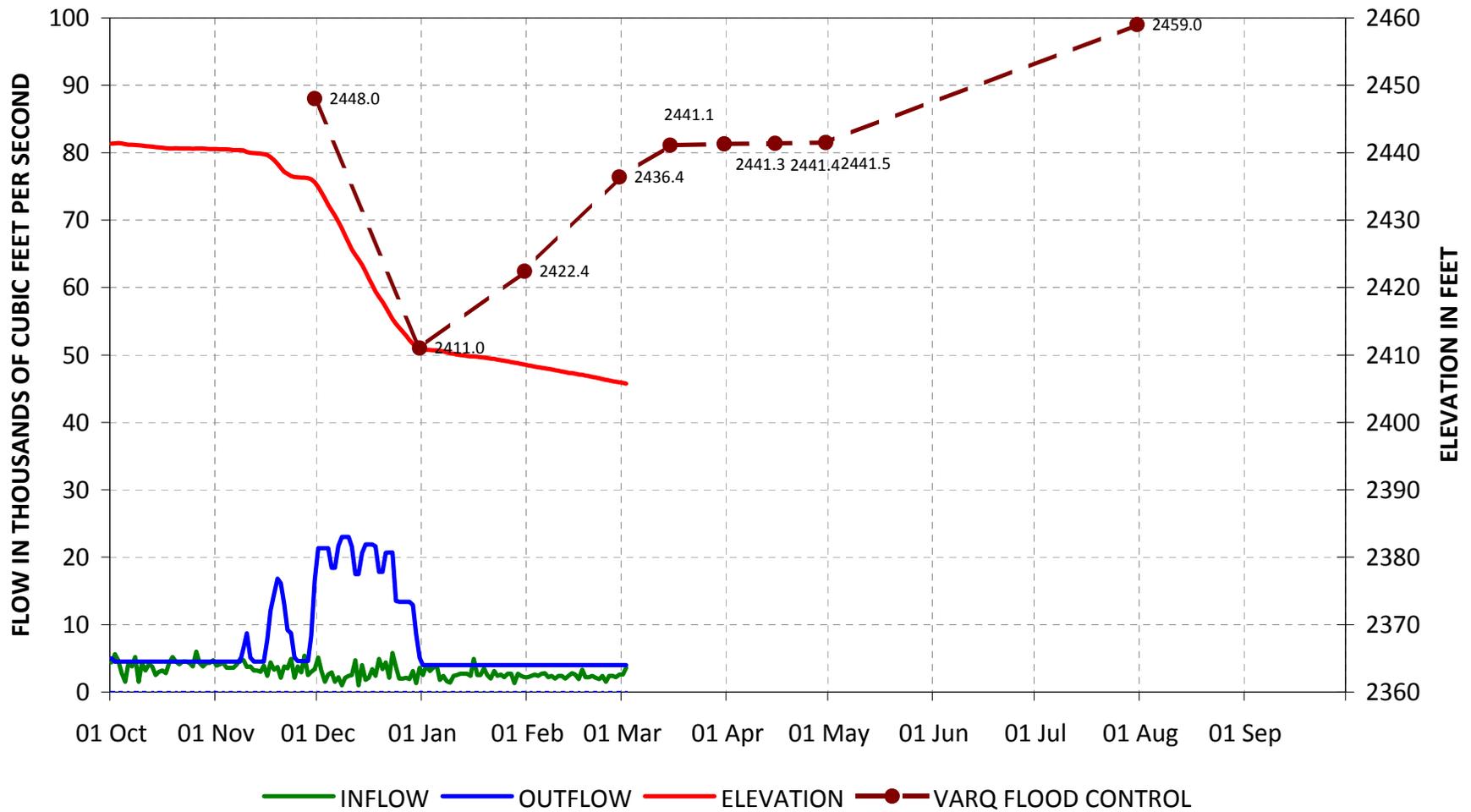


Ives 3 (2004-2010)



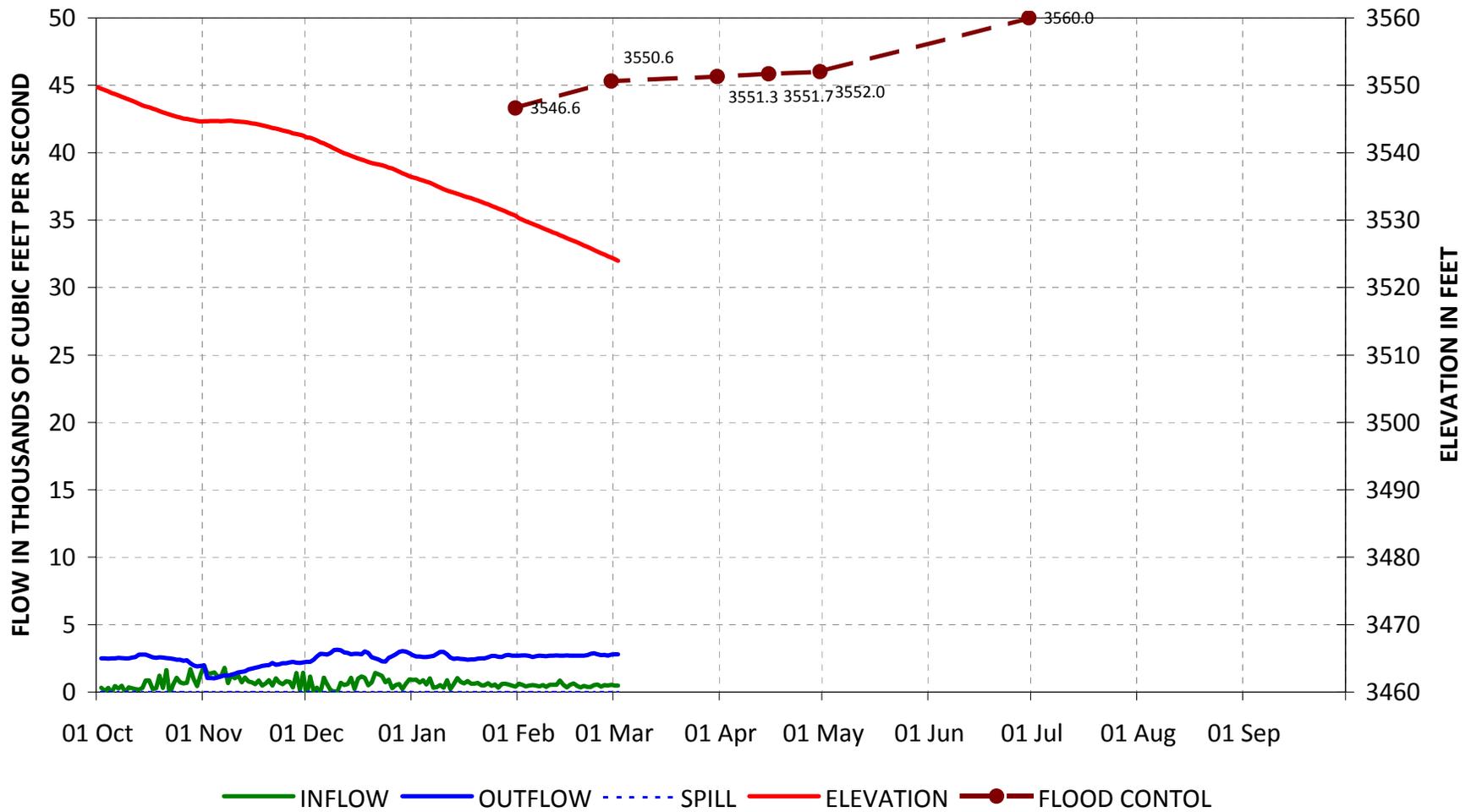
LIBBY DAM AND RESERVOIR

Water Year 2010



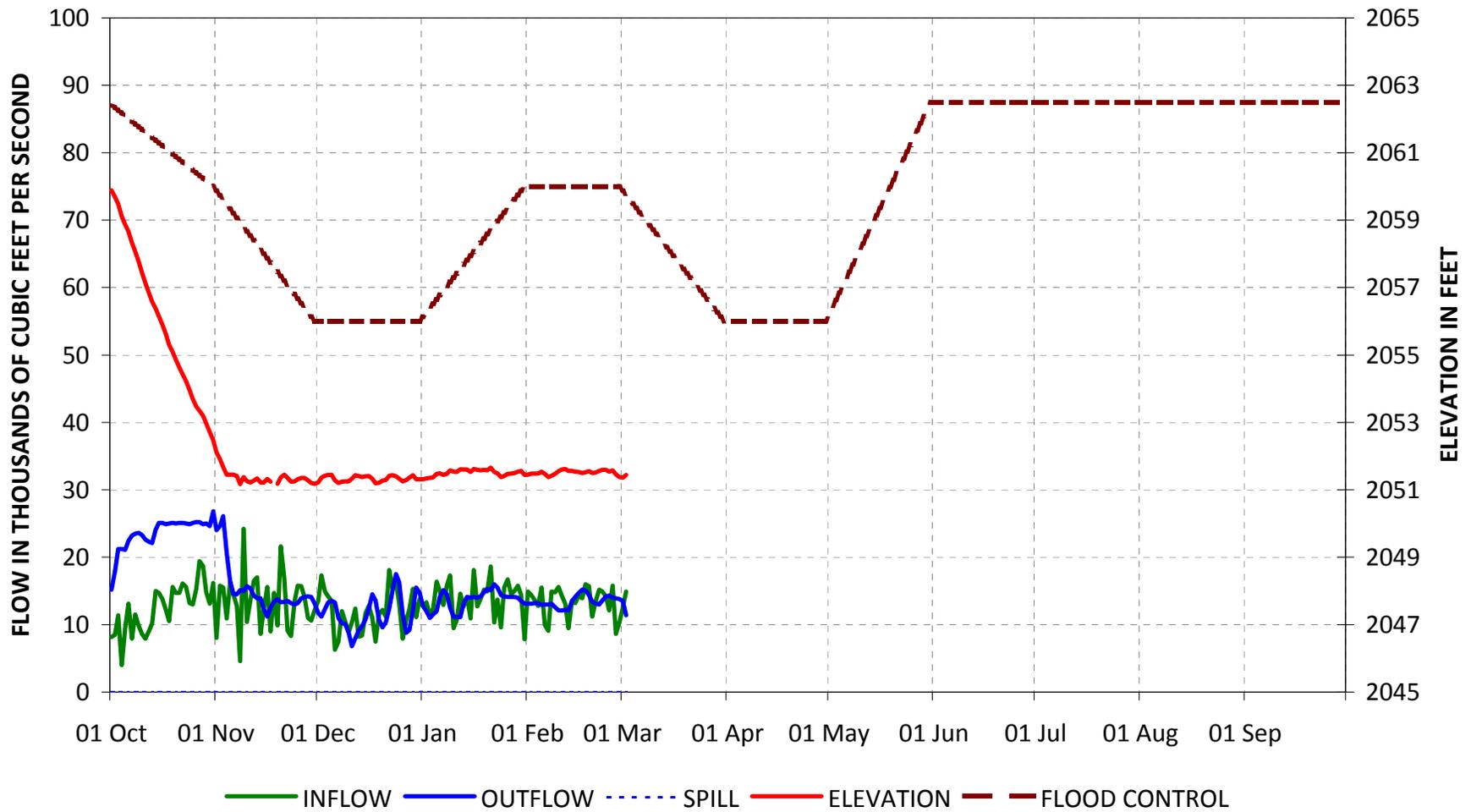
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



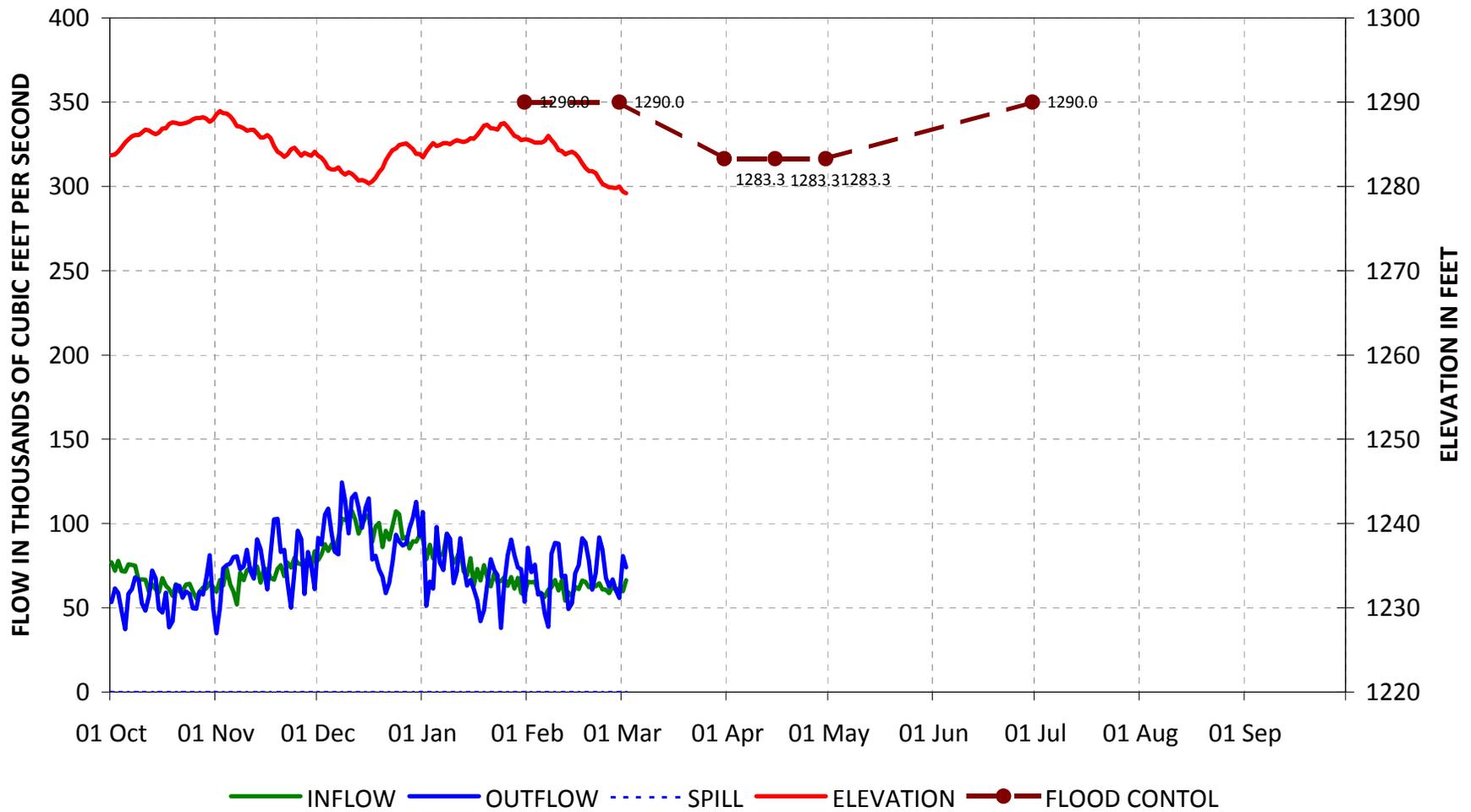
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



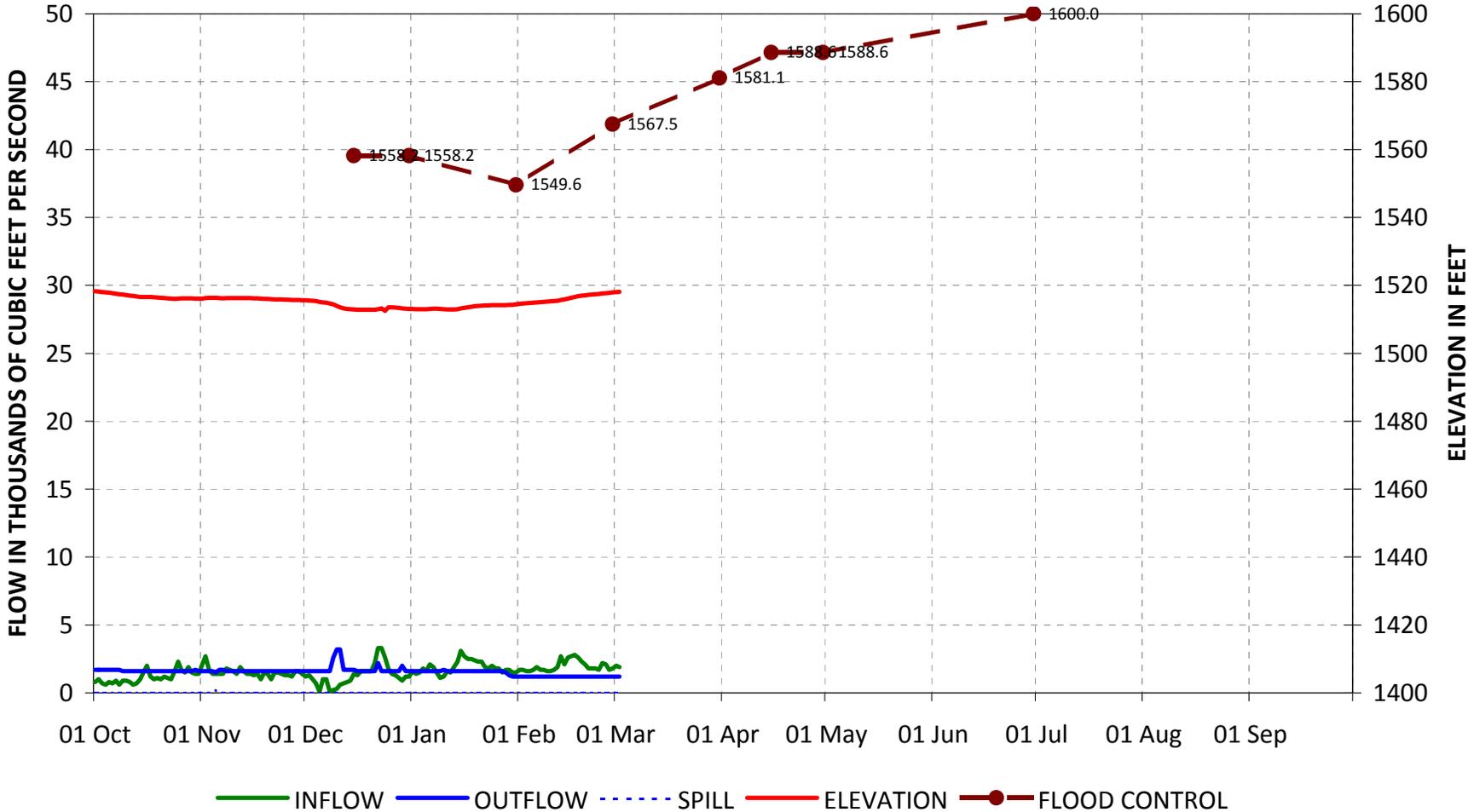
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



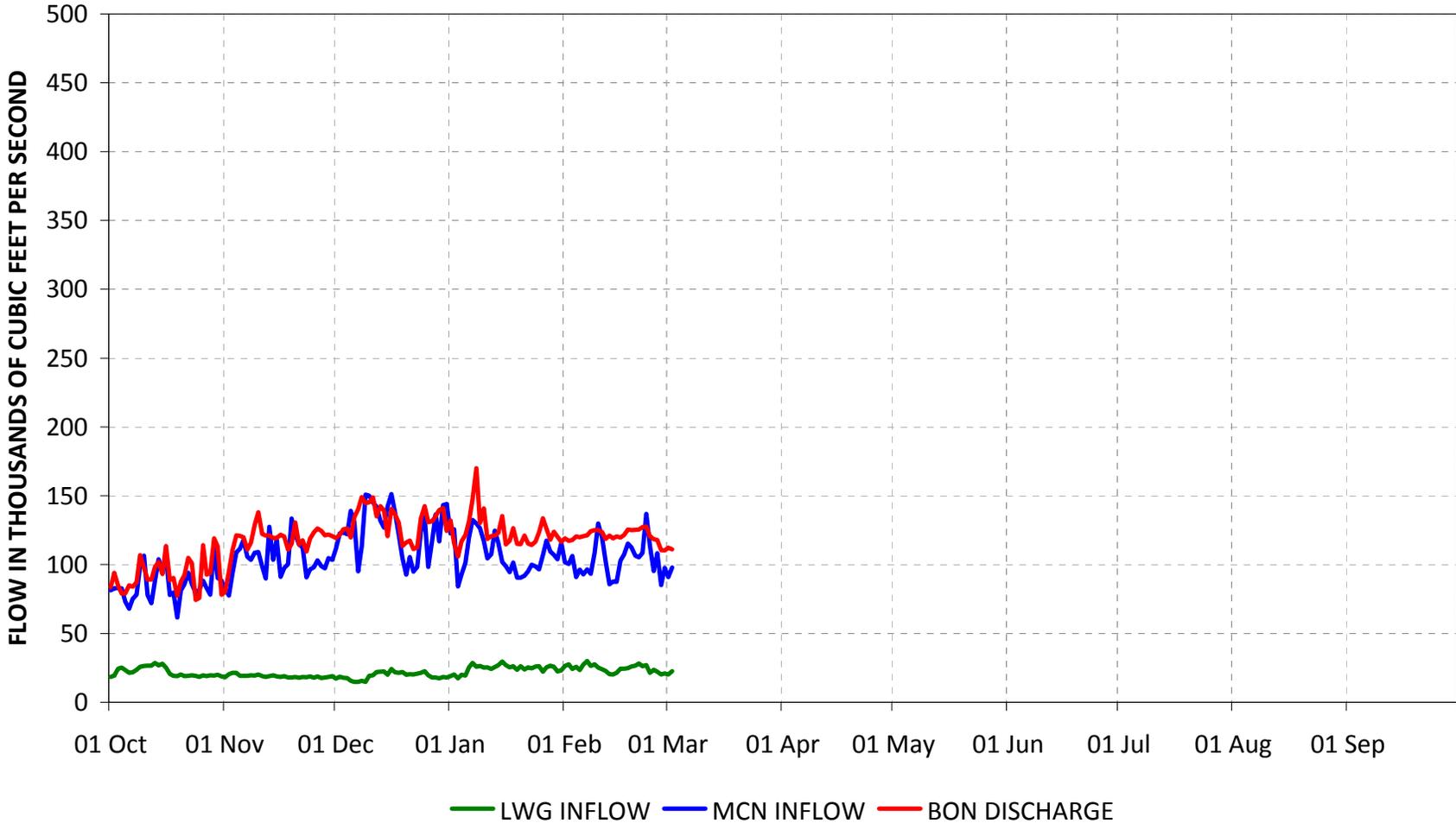
DWORSHAK DAM AND RESERVOIR

Water Year 2010



LOWER SNAKE AND LOWER COLUMBIA RIVER FLOWS

Water Year 2010









COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 3, 2010 Meeting

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 for February 17, 2010

John Roache, BOR, added some clarifying language in the “Operations” section of the facilitator’s notes regarding reservoir data for Grand Coulee and Hungry Horse. Kyle Dittmer, CRITFC, caught a typo in the “Review Meeting Minutes” section of the facilitator’s notes.

Action: DS Consulting will make the corrections and send a revised version to the COE for posting to the TMT website. There were no other comments or changes to either the facilitator’s notes or the official meeting minutes and both sets will be considered final.

The Dalles Spillwall Update

Steve Barton, COE, reported to TMT that mobilization efforts are likely beginning in early March, and that the project is expected to be complete in mid-March, ahead of schedule. He will connect with Pat Duyck, COE, to review any additional information.

2010 Operations/ Updated Weather and Flood Control Forecasts

Steve Barton, COE, directed TMT to updated SNOTEL data, posted as a link to the agenda, which details snow pack data for the northwest region. He explained that as of 3/3, all areas are at the same or lower levels since the last update two weeks ago and that the snow pack is below normal. He noted that while Canada is at 80% of normal, the long range outlook for the region is forecasting dryer and warmer than normal weather.

Kyle Dittmer, CRITFC, presented data gathered by the Australian Bureau of Meteorology (graph will be posted to the agenda following the meeting), detailing the 30-day moving SOI. Due to the on-going El Nino conditions, higher than normal temperatures are expected to continue through spring. Dittmer said that temperatures should be more near normal by June.

Barton also reported on the COE’s updated water supply forecasts as follows: Grand Coulee at 77% of normal for April-September, The Dalles at 69% of normal for April-August and Dworshak at 59% of normal April-July. The March final forecast is due out

on 3/5 and findings will be presented to TMT at the next meeting. Karl Kanbergs, COE, reminded TMT that the National Weather Service has a web-based, interactive presentation available through their website.

Action/Next Steps: Updates on Weather and Water Supply Forecasts will continue to be discussed at all TMT meetings in the near future.

Water Management Plan Spring/Summer Update

Steve Barton, COE, shared with TMT that the preliminary draft was posted on Monday 3/1. The final draft is due mid-May. He noted that a lot of changes to the document are expected as we move into spring.

Action/Next Steps: TMT will revisit this topic at the 3/17 TMT meeting. TMT members may send their review and comments to Steve Barton and Doug Baus; Barton will keep TMT members apprised of deadlines for submitting comments as that information becomes available.

Chum Emergence Update

Paul Wagner, NOAA, reminded TMT members that the BiOP calls for revisiting chum operations on a monthly basis. He reported that there is an increasing concern that upriver water supply is trending more below flood control levels and acknowledged that Salmon Managers do want to support chum populations in the mainstem. Wagner directed TMT to a graph, posted as a link to the agenda, showing data on weekly temperature unit totals in the Ives Island area (for 2004-present) collected by WDFW. He described the effect of temperature exposure on chum from eggs to the emergence of fry (metabolism and growth are driven by temperatures). He noted that this year is tracking similarly to 2005-06, when March 8th was declared the emergence date. Wagner said that if this Ives Island area population is protected through at least next week, then some good will be done. Chum, temperature and precipitation data are being closely tracked and Wagner suggested that TMT could revisit this issue next week, when more data will be available; he said NOAA recognizes that the time to make a decision is drawing nearer.

Steve Smith, Colville Tribes, shared that his organization was briefed on this issue last week. He said the Tribe considered the possibility of scraping 1' off the flood control channel and noted that the Colville Tribe plans to pursue all available options that might help with this issue for future years. Wagner noted that the Salmon Managers have discussed this option as well and that yes, they would be interested in exploring a change to the hydraulics in the fall given this type of low water year. Wagner confirmed that 10.5' is the tailwater elevation at which drying out chum spawning areas becomes an issue.

John Roache, BOR, noted the latest STP run showed that Grand Coulee will be at elevation 1272' if chum operations are to continue through April 10th. He asked TMT members for their thoughts on this issue at this point:

- Tony Norris, BPA, noted that every day that goes by is a flood control decision and Grand Coulee will likely continue to draft each day that operations continue

- to support chum. He noted that achieving refill is unlikely but possible, and that precipitation tides, as well as Brownlee and Priest Rapids flows are all among a multitude of factors that influence conditions in chum spawning areas.
- Paul Wagner, NOAA, said that given the chum protection investment that's been made so far, NOAA would like to see the operation though for one more week to help protect this first round of chum.
 - Dave Wills, USFWS, said that USFWS is comfortable with discussing this issue more next week, when final Weather Service forecasts will be available.
 - Russ Kiefer, ID, said ID supports the Colville Tribe in their desire to explore all available options to help support chum and water supply levels; ID also supports NOAA's suggestion to revisit this topic next week when more information is available.
 - Charlie Morrill, WDFW, said that WA is comfortable in discussing this item further next week.
 - Jim Litchfield, MT, said very MT is concerned for the drop in water supply but supported discussing the issue further next week.
 - Steve Smith, Colville Tribes, requested that next week's call include discussion of the percentage of chum emergence week to week.
 - Steve Barton, COE, said the COE acknowledges that this is a water management concern and supported discussing this issue further next week.
 - Kyle Dittmer, CRITFC, said he deferred to Salmon Mangers on this issue.
 - Deanne Pavlik-Kunkel, Spokane Tribe, said the Tribe is concerned about the continued drop down in water supply.

Action/Next Steps: This issue will be revisited during a TMT conference call scheduled for 3/10 at 2:00pm.

2010 Operations

Steve Barton, COE, presented TMT with a list of operations, tentatively scheduled between now and mid-April, which will require some group decision making from TMT:

1. Model runs are indicating that flows in the Lower Columbia River, and potentially the Snake, are such that the "Low Flow Procedures" of the Water Management Plan may need to be invoked. Meeting minimum generation needs and elevation requirements will be a challenge. There is a concern that the lack of water will affect the ability to spill in April for the fish passage season. He noted that conditions may be similar to last August and asked that TMT members start thinking about these needs. Tony Norris, BPA, added that the group should be prepared to act swiftly. Barton clarified that McNary, Bonneville and Little Goose are the projects that will be most affected.
2. Regarding the B2 corner collector operations at Bonneville, Barton asked TMT members to think about what would trigger that operation and how to proceed if low flow conditions continue.
3. Bonneville line outage and maintenance is scheduled for April 10th that requires powerhouse two to be out of service.
4. The dog pocket greasing at Bonneville will require some water management to allow access during the maintenance.

Wagner asked if these issues are being addressed in other forums such as FPOM; Barton answered that they should be introduced and Dave Wills, USFWS, confirmed that items 2, 3 and 4 are being discussed at FPOM. Their next meeting is 3/11 and Wills will share the discussion details on these topics at the next TMT meeting.

Action/Next Steps: TMT will revisit these issues in more detail at the 3/17 TMT meeting.

Transportation Update

Paul Wagner, NOAA, recalled the presentation made at TMT two weeks ago by the NMFS Science Center. Wagener referred TMT to NOAA's recent memo to the ISAB posted as a link to the TMT agenda. He referred to page 2 of the document, wherein NOAA references 2007 operations and concluded that if flows are below 65 kcfs, it would be more prudent to maximize transport at Snake River collector projects beginning no later than May 1 at Lower Granite. Wagner noted that while low flows always carry risk, this year will be exceptionally challenging given that ocean conditions are looking to be poor as well.

Wagner; the ISAB plans to meet in March to discuss the NOAA recommendation. Jim Litchfield, MT, agreed that during years of such low flows, high temperatures and predation risks, it is especially important to transport fish.

Action/Next Steps: The next TMT discussion of this issue is expected in April.

Operations Review

Reservoirs: (Summary Plots link posted to the agenda) Libby was at elevation 2405.75', with inflows of 3.6 kcfs and outflows of 4 kcfs. Albeni Falls was at elevation 2051.44', (1' operating range) with inflows of 14.9 kcfs and 11.4 kcfs outflows. Dworshak was at elevation of 1518.13' with inflows of 1.9 kcfs and outflows of 1.2 kcfs. McNary average flows were at 97.9 kcfs, Lower Granite flows were 22.6 kcfs and Bonneville average flows were 111 kcfs. Grand Coulee was at elevation 1279.2', operating to meet the chum tail water below Bonneville Dam. Hungry Horse was at 3523.97' with outflows of 2.7-2.8 kcfs.

Fish: Paul Wagner, NOAA, noted that the current focus is on chum as outlined earlier in the discussion.

Power System: Tony Norris, BPA, had nothing to report.

Water Quality: Scott English, COE, noted that the annual Temperature and TDG report has been posted to the new Water Quality Program page on the TMT website. He said that the web page will offer the latest Oregon and Washington water quality standards data and reports.

Action/Next Steps: The COE's Water Quality staff will make a presentation about the webpage to TMT at the 3/17 TMT meeting.

TMT Schedule

NOTE: TMT will likely meet weekly during the month of March.

The next TMT meeting will be: a **conference call on 3/10 at 2:00pm** to check in on Chum Emergence and any other time-sensitive issues. See the TMT agenda for call in information.

NOTE: The 3/17 meeting **will be held at NOAA at 9:00am in the St. Helens room.**

Agenda items will include:

- Notes Review
- The Dalles Spillwall Update
- 2010 Operations- Updated weather and flood control forecasts
- Water Management Plan Spring/ Summer Update
- Chum Emergence
- Low Flow operations
- Water Quality presentation
- FOP Update
- Hanford Reach
- Operations Review

**Columbia River Regional Forum
Technical Management Team Meeting
March 3, 2010**

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting) with representatives of the COE, WDFW, USFWS, NOAA, Montana, BOR, BPA, CRITFC, the Colville and Spokane tribes and others present. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made at the meeting. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for February 17, 2010

John Roache (BOR) had edits regarding Grand Coulee and Hungry Horse operations. On page 2 of the facilitator's notes, the last two sentences should read, "Grand Coulee was at elevation 1,283.4 feet, operating to meet both the chum tailwater restriction below Bonneville Dam and Vernita Bar protection flows, currently drafting about 0.5 feet per day." The Hungry Horse report should read, "Hungry Horse was at 3,527.13 feet, with outflows of 2.7 kcfs, which is 78% of the normal water supply forecast for February." Kyle Dittmer (CRITFC) noted that "known" was misspelled in section 2 of the facilitator's notes. Doug Baus (COE) will post these changes to the web page.

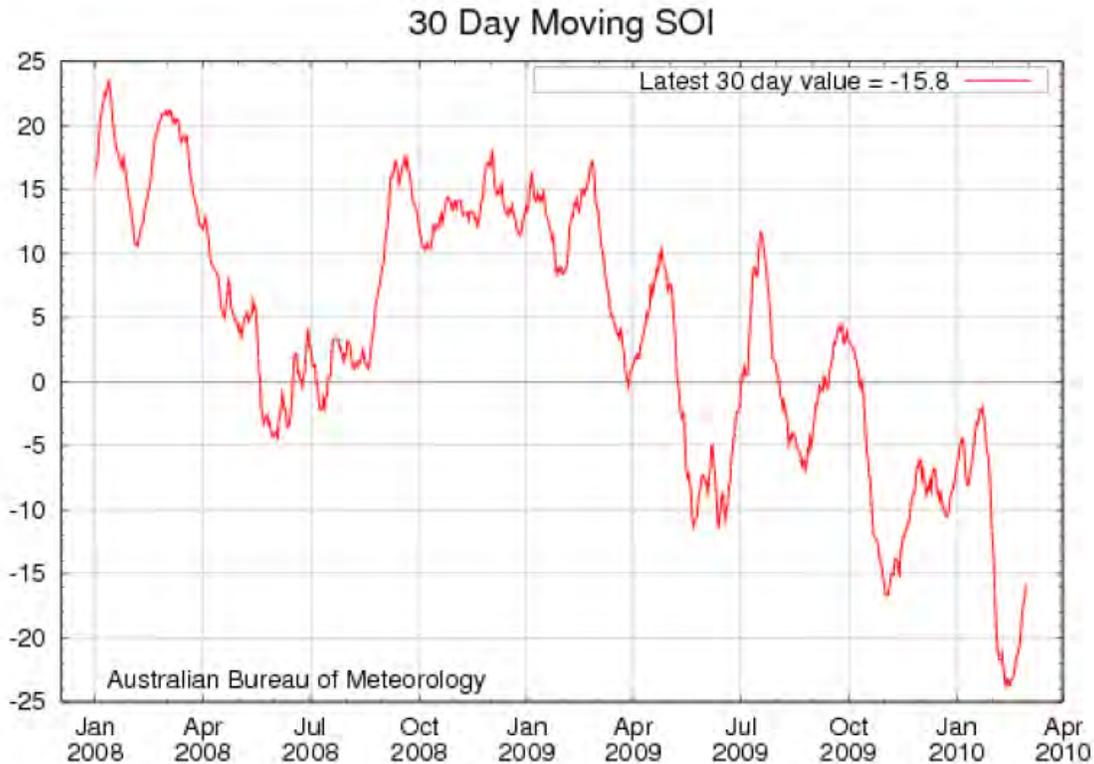
3. The Dalles Spill Wall Update

Construction is still progressing well ahead of schedule, Barton said. He will check with Pat Duyck, project manager, to see whether early release of restrictions on the Bonneville operation is possible.

4. Updated Weather and Flood Control Forecasting

a. Weather. As of March 3, water supply forecasts for all basins in the region are the same or lower than they were as reported at the last TMT meeting February 17. Areas in Canada are now forecasted to have around 80% of normal water supply except for the extreme north, which is normal. The continued long-range forecast remains drier and warmer than normal throughout the basin.

According to the Australian Bureau of Meteorology, the El Nino trend peaked a few weeks ago and temperatures in the Northwest are headed back toward normal in June, Kyle Dittmer (CRITFC) reported.



Both the RFC early bird March forecast and the COE's latest water supply forecast have dropped slightly since those last reported to TMT on February 17, Barton said. He and Steve Hall (COE Walla Walla) agreed the general trend is downward. Current water supply forecasts are:

- Grand Coulee – Jan-July: 77% of normal or 48.7 maf; April-Sept: 78% of normal.
- The Dalles – Jan-July: 69% of normal or 74 maf. The ESP forecast for Jan-July is 71.7 maf, above 60% of normal.
- Dworshak – April-July: 1,571 kaf or 59% of normal (COE forecast).

b. Flood Control. The March final forecast is due from the RFC on March 10, which will reset flood control targets. Barton will update TMT at the next meeting, a conference call on March 10. Current status is:

- Dworshak – End of March flood control is 1,587.5 feet, subject to change.
- Libby – An update is due today or tomorrow. The COE February final forecast for April-August is 5,478 kaf or 86% of normal. The RFC forecast is 4,678 kaf or 72% of normal – a difference of 800 kaf.

Karl Kanbergs (COE) said the Weather Service does a web-based interactive presentation every time they release a new forecast. Weather Service water supply forecast updates and interactive meetings are accessible via the NOAA web site. TMT will be watching the water supply forecasts closely and will check in via conference call in a week on March 10.

5. Water Management Plan – Spring/Summer 2010 Update

The draft 2010 WMP spring/summer update was posted March 8 to the TMT site for comments, Barton said. The final version is due mid-May. In the meantime, expect changes as 2010 conditions evolve. At the next meeting March 10, Barton will present a deadline structure for commenting on the WMP.

6. Chum Emergence Update

Paul Wagner (NOAA) presented data on chum spawning at Ives Island, linked to today's agenda. The BiOp calls for monthly checks to make sure the chum operation doesn't negatively affect spring flows. With Grand Coulee 2 feet below its flood control elevation and forecasted to stay there, NOAA is concerned that continuing to provide water for chum could impact upriver storage. However, the 4 months of flow maintenance invested in chum spawning in the mainstem Columbia makes NOAA reluctant to give up on chum. The question is, if chum flows continue, how much lower will the Grand Coulee elevation go?

Peak spawning occurred the first week of December 2009, so if that group of redds can be protected through emergence, the past 4 months of flows will have done some good. Chum fry consistently emerge when 825 temperature units accrue in their gravel beds (TU's equal the number of degrees above centigrade the eggs are exposed to). Data from 3 temperature gages at the Ives Island complex are linked to today's agenda. Data from Gage 1 put emergence as beginning March 8 and continuing for the next 5 weeks or so. Whether and when the chum operation should end after March 8 is the question NOAA is considering now, Wagner said. The other spawning area for chum is Gray's River, separated from Ives Island by 100 miles.

Grand Coulee elevation is now 1,279 feet, below the flood control elevation of 1,283.3 feet, Tony Norris (BPA) reported. It's noteworthy that the flood control elevations for March 31, April 15 and April 30 are all the same – which makes it prudent for TMT to check in weekly on the chum operation.

Another consideration is providing Vernita Bar protection flows of 60 kcfs, Wagner said. These can drop to 55 kcfs, or no more than 15% of the prior protection level in a critical water year, per the Vernita Bar Agreement. A critical water year is defined as having 42.5 kcfs volume or less. At this point, the parties would have to agree to drop Vernita Bar flows to 55 kcfs, Wagner said. The March final forecast to be released on March 5 will shed light on this situation.

The second link to this item on today's agenda contains weekly WDFW data on fish observed in the spawning area. Peak numbers of fish and redds were observed on the same day, December 1. These are the redds NOAA is trying hardest to protect.

Steve Smith (Colville Tribe) offered a possible solution for this dilemma in future years: Scrape a foot or so of elevation off the flow control riffle in the Ives Island channel to help keep redds inundated at lower levels. He asked for others' views of this idea. Changing the channel hydraulics in fall would risk not attracting spawners to the gravel beds, but it could be used in an emergency, Wagner said. An elevation of 10.5 feet dries out the back side of Ives Island, depending on flows from Hamilton Creek. The river widens downstream of Ives Island, where tidal influences take over and the elevation varies up to 4 feet a day, Norris added.

According to a BOR model run, if the chum operation continues through April 10, Grand Coulee elevation will be around 1,272 feet, 10 feet below flood control. John Roache (BOR) polled the salmon managers for their views on the chum operation:

- **USFWS** – Wants to continue providing flows for chum until the final March water supply forecast comes out, then make a decision. Would like to maintain redds in the I-205 area, which are 50-60% of chum spawners.
- **Idaho** – Supports the Colville Tribe's proposal to seek a permanent alternative to the annual chum dilemma; agrees that it won't be solved this year. Supports NOAA's approach of preserving the chum investment as long as possible. Ultimately, spring flows take precedence over chum.
- **WDFW** – Agrees with Idaho's and NOAA's stance.
- **Montana** – Very concerned about the water situation but doesn't have strong views on the chum operation.
- **CRITFC** – Deferred to the other salmon managers.
- **Colville Tribe** – Wants to seek a long-term fix, as described above. Asked NOAA to give TMT weekly percentages of chum emergence which Wagner said he'll provide. Suggested that NOAA consider sampling redds to establish emergence percentages.
- **Spokane Tribe** – Concerned about further drawdown of Lake Roosevelt.

The COE will continue the chum operation as is until a change is agreed upon and requested by the salmon managers. TMT will revisit this issue in its April 10 conference call.

7. 2010 Operations

Barton brought TMT's attention to five more issues for TMT members to think about over the coming weeks.

(1) Model runs indicate that, with no flood control at Grand Coulee to augment river operations, the river may hit sufficiently low levels during the 2010 spill season to invoke low-level procedures outlined in the Fish Passage Plan. These procedures are invoked if there's insufficient flow and available storage to meet system requirements for minimum generation, minimum flows and reservoir elevations at individual projects. TMT needs to be ready to respond if this occurs. There would be problems at McNary, Bonneville and Little Goose dams.

(2) Decisions will need to be made regarding operation of the Bonneville corner collector for kelts and strategies for operating the corner collector under low flow conditions.

(3) On April 10, line maintenance at Bonneville will take powerhouse 2 out of service.

(4) Greasing of the dog pockets at the Bonneville gates will require storage to be evacuated.

(5) Sill problems at the Little Goose navigation lock require a critical depth for adequate clearance. Thus the proposed spill operation for Little Goose during low flow conditions is to cycle back and forth between operating one and two units while trying to keep the project within MOP.

All of these issues will be on the TMT agenda for March 17. Dave Wills noted that issues 2, 3, and 4 have already been discussed at FPOM. On March 17 he will share with TMT the outcome of the next FPOM meeting March 11.

These issues will also be addressed in the 2010 Fish Operations Plan. Barton will email TMT members when the draft FOP is available.

8. Transport Update

The NOAA Science Center's report on transportation operations from 1998-2008 indicates that low flow operations are risky for fish, Paul Wagner (NOAA) said. The BiOp says that when total river flows go below 65 kcfs, transportation should occur beginning April 3, with no spill during migration season. It appears that 2010 could be one of those years. No spill at collector projects in the Snake River during spring migration season.

If flows are above 65 kcfs, NOAA proposes a rollover operation in 2010, but if not, NOAA's recommendation is to extend the period of spill to April 3-May 1 and allow TMT to decide whether to terminate spill or begin transport earlier than that. NOAA acknowledges that gains have been made for in-river survival, but they're not sufficient to preclude the need for transportation in low flow years. NOAA has taken into account ISAB's 2008 recommendation, "Whenever river conditions allow during the late April-May period, a strategy allowing for concurrent transportation and spill is prudent. NOAA looked at data in 2007 and

believes it would not be prudent to continue spilling in May at the three collector projects.” ISAB will discuss this in a March 12 meeting and again on March 26.

Wagner asked the other salmon managers for their views on spill vs. transport in a low flow year. Balancing the needs of spring Chinook and steelhead in a low flow year is a challenge. Transporting Chinook smolts downriver too early results in their lingering in the estuary when they’re small, which is risky due to predation.

When flows are low, temperatures high, and predation up, it’s best to get fish out of the river as soon as possible, Jim Litchfield (Montana) said. There were no other comments on NOAA’s proposal today. TMT will revisit the transport operation in April.

9. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,279.2 feet, currently providing flows to maintain the forecasted tailwater restriction of 11.5 feet. Hungry Horse is at elevation 3,523.97 feet, with discharges of 2.8 kcfs and inflows forecasted to be 78% of normal.

Libby is at elevation 2,405.75 feet with average inflows of 3.6 kcfs, discharging 4.0 kcfs minimum flows. Albeni Falls is at elevation 2,051.44 feet, operating with a 1-foot range, with inflows of 14.9 kcfs and discharges of 11.4 kcfs. The flood control trace for Dworshak doesn’t reflect the latest flood control elevations; it will be updated and reposted. The current Dworshak elevation is 1,518.3 feet with inflows of 1.9 kcfs and discharges of 1.2 kcfs.

Seven-day average inflows are 22.6 kcfs at Lower Granite; 97.9 kcfs at McNary; and 105 kcfs at Bonneville.

b. Fish. There was nothing to report beyond chum.

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

d. Water Quality. The annual TDG and temperature report for 2009 is posted on the RCC water quality page, Scott English (COE) reported. To access it, go to water quality data on the TMT web page. The RCC page includes an ongoing evaluation of the new Washington and Oregon state water quality standards, a tool to identify the most stringent requirements at each project. TMT will walk through the water quality data at its March 17 meeting.

10. Next Meeting

The next TMT meeting will be a 2 p.m. conference call on March 10 primarily to address chum flows, followed by a March 17 meeting at NOAA’s Portland office. The March 17 meeting will cover the same agenda items discussed today, plus a presentation on state water quality standards and a

possible update on protection flows at Hanford Reach. This summary prepared by technical writer Pat Vivian.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Charles Morrill	WDFW
Dave Wills	USFWS
Paul Wagner	NOAA
Doug Baus	COE
Jim Litchfield	Montana
John Roache	BOR
Tony Norris	BPA
Kyle Dittmer	CRITFC
Scott English	COE
Laura Hamilton	COE
Karl Kanbergs	COE
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Tim Heizenrader	Centaurus
Rob Diaz	Integral Renewables
Pat Zimmer	BPA

Phone:

Russ Kiefer	Idaho
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Dave Benner	FPC
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Shane Scott	PPC
XX	EWEB
XX	Seattle City Light
XX	Snohomish PUD
XX	Puget Sound Energy
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Richelle Beck	DRA
Brenda Anderson	BPA
Deanne Kunkel	Spokane Tribe
Mike Butchko	Powerex
Jim Heffernan	CRITFC

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Wednesday March 10, 2010 14:00 - 15:00

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 792436

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnw.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Chum Emergence Update - Paul Wagner, NOAA Fisheries
 - a. [Ives Island Temperature Data](#)
3. Water Supply Forecast NWRFC - Steve Barton, COE-RCC
4. FOP Update - Dan Feil, COE-PDD
 - a. [Draft 2010 Spring Fish Operations Plan](#)
5. [\[Calendar 2010\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

Draft 2010 Spring Fish Operations Plan

INTRODUCTION

The 2010 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 2010 spring fish migration season; generally April through June. The 2010 Spring FOP is consistent with the 2009 Court ordered spring spill operations, the adaptive management provisions in the 2008 NOAA Fisheries FCRPS Biological Opinion (2008 BiOp) as implemented through the Adaptive Management Implementation Plan (AMIP), and the Corps' Record of Consultation and Statement of Decision (ROCASOD) adopting the project operations contained in the 2008 BiOp and Columbia Basin Fish Accords (Accords).

As in 2009, the 2010 Spring FOP incorporates planned project operational adjustments necessary to conduct essential research to accommodate the installation or adjustment of fish passage features for the 2010 spring migration season. Other FCRPS water management actions and project operations not specifically addressed in this document shall be consistent with the 2008 BiOp and other guiding operative documents including the 2010 Water Management Plan (WMP), seasonal WMP updates, and the 2010 Fish Passage Plan (FPP). As in 2009, 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' 2010 Spring FOP assumes average runoff conditions. However, because 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.

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 consistent with the current State of Washington TDG saturation upper limits.¹ 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 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

¹ 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) in 2010.

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. 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 Little Goose Dam as specified in Table LGS-13 of FPP Section 8 when river discharge is less than 38 kcfs; or up to $\pm 3.5\%$ at The Dalles Dam when total river discharge is less than 300 kcfs). Prescribed or specified percentages in Tables 2 and 3 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 rates 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. 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 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, 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. Also, Ice Harbor turbine units cannot be operated at the lower end of the $\pm 1\%$ of best efficiency range. At a generation level somewhat higher than the lower $\pm 1\%$ limit, 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 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 (kcf)
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	1-6	8.5-10.3
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 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 kcf, 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 2009, 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. If necessary in 2010, a similar operation, modified as necessary to include any configuration or operational changes, will be implemented during low flow periods, after coordination with TMT. It is presumed this condition will be alleviated by following the newly developed Little Goose spill pattern tables located in the FPP Section 8. The new tables call for removing the spillbay weir from service within three business days after the daily average flow drops below 38 kcfs for three consecutive days. An alternative low flow operation may be to operate the spillway weir in a summer or high-crest configuration using the 2009 high-crest spill pattern table. This alternative would continue operation of the spillway weir without “training spill” to a lower total river discharge with the objective of meeting the 30% spill target. If total river discharge dropped to a point where maintaining 30% spill was no longer possible, the spillway weir would be closed and spill would be provided through conventional spillbays at either 30% or at a flat kcfs discharge as described above in coordination with the 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.

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 Fish Passage Operations and Maintenance Coordination Team (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.² To improve survival of juvenile migrants the 2008 BiOp, relying on the best available scientific information, calls for maximized transportation beginning on April 3 in exceptionally low water years when the seasonal regulated flow is ≤ 65 kcfs³ at Lower Granite Dam. This is accomplished by stopping spill at the three collector projects, Lower Granite, Little Goose, and Lower Monumental dams and diverting fish through the bypass facilities for collection and transport.

After reviewing the updated best available scientific information, NOAA recommends that if the 2010 seasonal regulated flow conditions are ≤ 65 kcfs in the lower Snake River, as currently predicted, transportation operations should be maximized beginning May 1 at Lower Granite, and four and seven days later at Little Goose and Lower Monumental dams respectively. This recommendation is based on data from recent years (2006-2008), in particular data from 2007 a low flow year.⁴ NOAA has developed a low flow

² The 2007 and 2008 FOPs 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."

³ The seasonal average flow projections will be based on the Corps' STP model and the April final forecast for Lower Granite Dam for the April through June time period (available by April 7, 2010).

⁴ April 3–June 21, 2007 seasonal regulated flow average was 61.2 kcfs at Lower Granite Dam.

(≤ 65 kcfs) transportation proposal and rationale, which has been submitted to the Independent Science Advisory Board (ISAB). The ISAB has agreed to review the proposal and provide feedback to NOAA in April.

If the April final water supply forecast indicates a seasonal regulated flow of ≤ 65 kcfs in the lower Snake River, the Corps and NOAA, in coordination with the regional sovereigns, will consider the best available science including the ISAB input to make a final determination before May 1 on the transportation operations.

The following describes the proposed transportation operations for the lower Snake River projects for average water conditions as well as exceptionally low water conditions, followed by McNary project operations. Detailed descriptions of project and transport facility operations to implement the program are contained in the FPP Appendix B.

Lower Snake River Dams - Operation and Timing

If the Snake River projected seasonal average (April 3 – June 20) regulated flow is > 65 kcfs, the Corps will initiate transportation 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).

If 2010 is an exceptionally low water year with projected seasonal average flows ≤ 65 kcfs, as noted above, the Corps will review the ISAB recommendation and determine transportation schedule and operations in coordination with NOAA, regional sovereigns, and the TMT.⁵

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. Transport 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.

⁵ The Corps will review projected river flows based on the May final water supply forecast (available May 7) and may adjust spill and transport operations following coordination with the TMT.

McNary Dam - Operation and Timing

Spring: Juvenile fish collected at McNary during the spring, April 1 through June 20, 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.

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 the TMT coordination process.

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.

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.

Table 2.— Summary of 2010 spring spill levels at lower Snake and Columbia River projects.⁶

Project	Planned 2010 Spring Spill Operations (Day/Night)	Comments
Lower Granite	20 kcfs/20 kcfs	Same as 2009
Little Goose	30%/30%	Same as 2009
Lower Monumental	Gas Cap/Gas Cap (approximate Gas Cap range: 20-29 kcfs)	Same as 2009
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 2009
McNary	40%/40%	Same as 2009
John Day	Pre-test: 30%/30% Testing: 30%/30% vs. 40%/40%	Same as 2009
The Dalles	40%/40%	Same as 2009
Bonneville	100 kcfs/100 kcfs	Same as 2009

PROJECT BY PROJECT SPRING OPERATIONS

The following sections describe 2010 spring spill operations for each project. Included in the descriptions are planned research activities identified in the 2008 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 2010. 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.

⁶ 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."

Lower Granite

Spring Spill Operations April 3 through June 20, 2010: 20 kcfs 24 hours per day.

Changes in Operations for Research Purposes:

- Spring research operations: There will be no special spill operations for research in 2010. Established spill patterns as described in FPP Section 9 will be used in 2010.

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 fish transportation barges entering and exiting the tailrace and/or while moored at the fish loading facility. If such runoff conditions occur, spill may 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, Lower Granite pool MOP elevation restrictions will likely be temporarily exceeded until the barge 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, 2010: 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 will be no special spill operations for research in 2010. Established spill patterns as described in FPP Section 8 will be used in 2010.

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: In 2010, 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, 2010: Spill to the 115/120% TDG spill cap 24 hours per day.

Changes in Operations for Research Purposes:

- Spring research operations: There will be no special spill operations for research in 2010. The “bulk” spill pattern as described in FPP Section 7 will be used in 2010 based on previous years’ study results.

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, 2010: 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 RSW operating and continue through the spring season. Nighttime spill hours are 1800–0500.

Changes in Operations for Research Purposes:

- Spring research operations: There will be no special spill operations for research in 2010. Spill patterns as described in FPP Section 6 will be used in 2010.

Operational Considerations:

- The alternating two-day spill treatments may be reversed within the four-day test block to accommodate power needs if necessary. If the order of the two-day treatment is reversed, the total number of each spill level treatment for the spring season will not change.
- 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 will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. Dates are subject to change.
- 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, 2010: 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 has been 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 will be no special spill operations for research in 2010. Spill patterns as described in FPP Section 5 will be used in 2010. There will be special turbine operations for research in 2010. The special research operation will affect powerhouse units 4 and 5 which will be operated outside 1% efficiency to examine if adverse fish condition or descaling effects occur as a result. This

evaluation is planned to occur on weekdays beginning on May 3 and continue through spring. The study has been coordinated through the SRWG process. 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:

- 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 will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. Dates are subject to change.

John Day

Spring Spill Operations April 10 – June 30, 2010: 30% spill 24 hours per day prior to testing, then 30% spill vs. 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 spillway weir 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: A repeat of the 2009 spillway weir test is presented here for planning purposes; however details such as spill pattern and test timing may change. These changes will be coordinated through the SRWG and TMT. Two spillway weirs that pass approximately 10 kcfs spill each are installed in spill bays 18 and 19. Training spill patterns to support the spillway weir jets and provide good downstream egress for juvenile salmonids have been developed by modeling at ERDC and coordination with regional agencies. These are included in the FPP. Two spill levels will be tested to provide spill / spillway weir efficiency curves. These data will be used to design surface flow outlet and tailrace improvements at John Day Dam.
- 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 yearling Chinook, and juvenile steelhead for two spill treatments.
- Spill pattern during biological test: Spill bays 18 and 19 have the spillway weirs installed, which are not easily opened and closed. Spill patterns for 30% and 40% spill have been developed at ERDC in coordination with regional agencies. These patterns are included in the FPP. From late April through early June, 30% spill versus 40% spill will be evaluated.

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, 2010: 40% spill 24 hours per day.

Changes in Operations for Research Purposes:

- Spill pattern during the biological test: New spill patterns developed for use with the recently completed 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 37.3 to 43.1 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 38.1 to 42.1 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 39.0 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, 2010: 100 kcfs spill 24 hours per day.

Changes in Operations for Research Purposes:

- Spill duration for testing: No special spill operations are required for biological tests in 2010. Current FPP spill patterns included in FPP section 2 will be used.

Operational Considerations:

- Minimum spill discharge rate is 75 kcfs however, under extreme low flow conditions when 75 kcfs spill is not achievable while maintaining minimum generation requirements, 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.

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 5, with marking beginning on April 6, 2010. 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 April 20, 2010 with the goal of tagging approximately 120,000 smolts, about 2/3 of which will be released into the tailrace of Lower Granite Dam, and 1/3 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 2010 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:

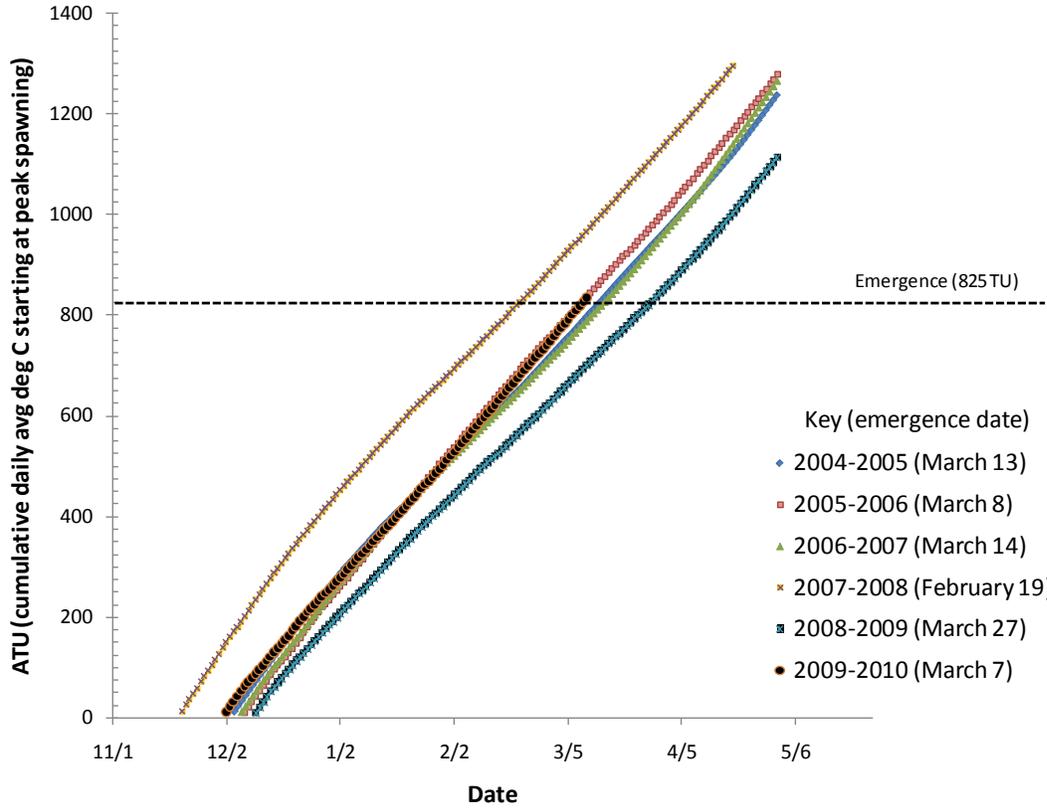
<http://www.nwd-wc.usace.army.mil/report/projdata.htm>

- Water Quality: TDG and water temperature data are posted to the following website every 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 highest and highest consecutive 12-hour average TDG levels daily for each station. These averages are reported at:

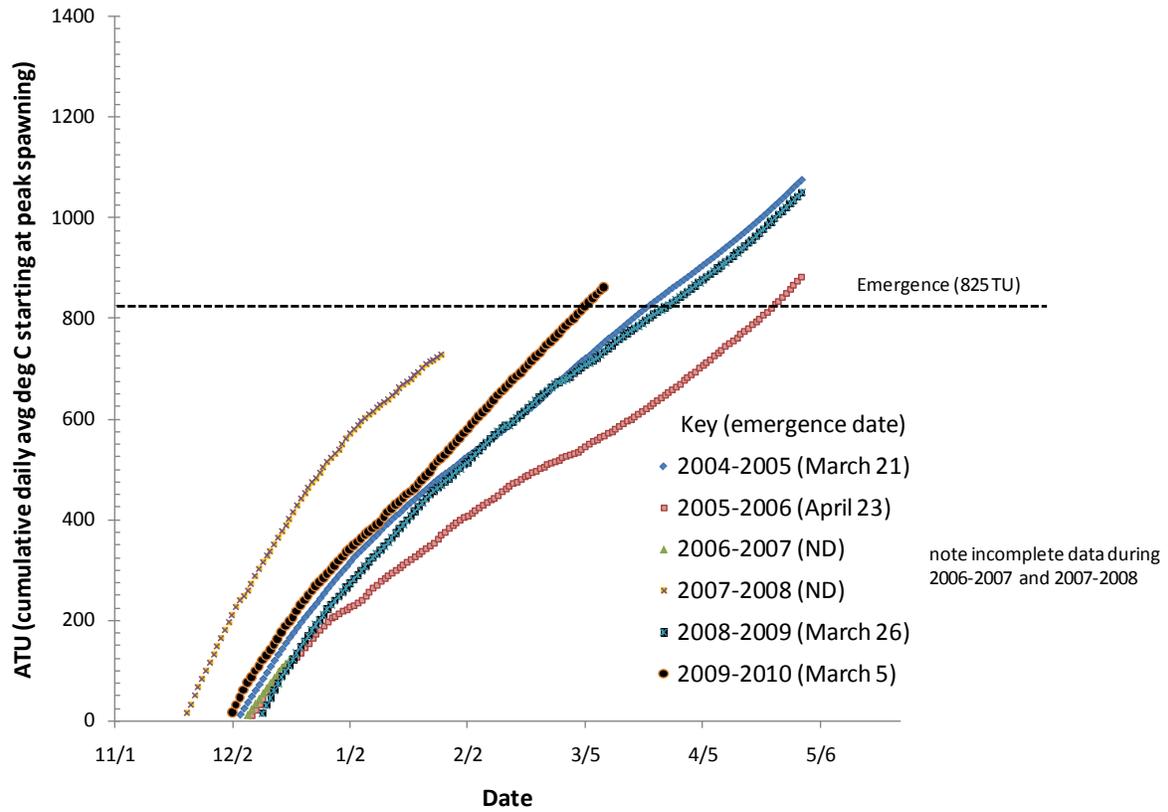
http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/html/

DRAFT

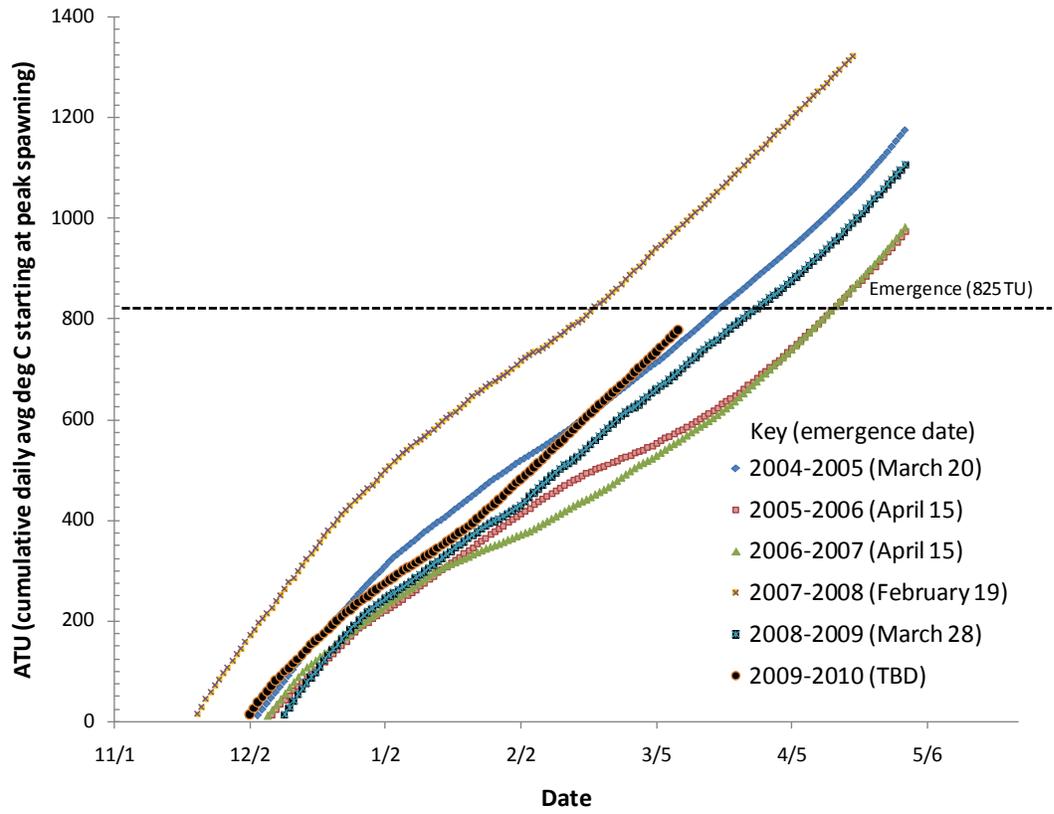
Ives 1 (2004-2010)



Ives 2 (2004-2010)



Ives 3 (2004-2010)



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 10, 2010 Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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.

Chum Emergence Update

Paul Wagner, NOAA, directed TMT to temperature data, posted as a link to the agenda. He began by reminding TMT that the Water Supply Forecast, relative to chum emergence, is well below average this year as there has been little precipitation in the basin. He also detailed the readings of three gauges designed to measure chum emergence data. Gauges one and two indicated that emergence was underway and gauge three indicated that there is still a few days to a week left to go as the targeted 825 had not yet been reached. Wagner stated that NOAA recognizes that providing water for chum borrows from the spring/summer water supply, putting spring migration at risk. Given the need to balance water needs, NOAA proposed relaxing the protection that has been in place for the chum population by using the following step-wise approach:

- Effective on 0001 hours on Monday, March 15, 2010, operate Bonneville Dam to maintain a minimum Bonneville tailwater elevation of 11.0 feet.
- Effective on 0001 hours on Wednesday, March 17, 2010, operate Bonneville Dam to maintain a minimum Bonneville tailwater elevation of 10.8 feet.
- Effective 0001 Hours on Friday, March 19, 2010, operate Bonneville Dam to maintain a minimum Bonneville tailwater elevation of 10.5 feet.
- Effective 0001 hours on Monday, March 22, 2010, transition to Vernita Bar minimum operations and the tailwater elevation that provides.

Wagner explained that the reason for the incremental step down is that chum move vertically and will hopefully respond to the stepped-down water levels by migrating out of the area. He added that if precipitation conditions change, TMT will need to revisit the specifics of the operation.

John Roache, BOR, Tony Norris, BPA, and Steve Barton, COE, thanked Wagner for his work and agreed with the decision but requested to hear from the other salmon managers on the issue. Positions were as follows:

- Charles Morrill, WDFW: support the NOAA proposal as it seems to be the most reasonable approach.
- Dave Wills, USFWS: no objection to the NOAA proposal.
- Russ Kiefer, ID: support the NOAA proposal as written.

- Deanne Pavlick-Kunkel, Spokane Tribe: no objection.
- Kyle Dittmer, CRITFIC: support the NOAA proposal as written.

Action/Next Steps: The NOAA proposal will be implemented as stated above. This item will be revisited at the next TMT meeting on 3/17.

Water Supply Forecast NWRFC

Steve Barton, COE, provided water supply updates per the March final forecasts produced by the COE and the River Forecast Center: Grand Coulee 75% of normal, The Dalles 67% of normal, Lower Granite 56% of normal, Libby 80% of normal and Dworshak 59% of normal. Karl Kanbergs, COE, reported that precipitation so far for March is at 75% of average. Barton noted that there has not been a lot of movement in flood control elevations. He added that the Initial Control Flow has been lowered to 200 kcfs. Dave Wills, USFWS, asked why the COE and NWRFC percentage data differs from each other; Barton answered that the agencies use different models and variables and there are differences in how they weigh observed precipitation and snow on the ground.

Action/Next Steps: Updates on Weather and Water Supply Forecasts will continue to be discussed at all TMT meetings in the near future.

Draft 2010 Fish Operations Plan

Dan Feil, COE, directed TMT to the Draft 2010 Spring Fish Operations Plan, posted as a link to the agenda. He noted that for the most part the document is consistent with the 2009 court-ordered operations. The document has been distributed to TMT and RIOG for review and will be finalized Friday 3/12 or early next week when it will be sent to the court for approval. Feil reviewed for TMT the various topics and subjects covered in the document. He touched specifically on Transport Operations, Spill Projects and detailed the few operations that are different from 2009 operations: the low-flow operations, the McNary ESB screen installation dates, and the bulk spill pattern to be used in 2010 at Lower Monumental Dam. Feil said that the COE expects to receive a court order shortly after submitting the draft FOP to the court.

Action/Next Steps: TMT members are invited to review the draft document and email or call Dan Feil with any significant, substantive comments by noon on Friday 3/12.

B2 Corner Collector Operation

Dan Feil, COE, reminded TMT that the 2010 March kelt operation at Bonneville has been a topic of ongoing discussion at FPOM. The current operation follows the trigger criteria recommended by FPOM with one addition as follows:

- 2 kelts observed on two consecutive days (met this weekend) and a cumulative 20 total fish observed in the Juvenile Bypass System (so far there have been eight).
- Within 14 hours of the trigger being met, the B2 corner collector (B2CC) will be opened.
- If upon opening the B2CC, TDG exceeds 105% at the Warrendale fixed monitoring station, the B2CC will be closed.
- The project will then switch to a BI powerhouse operating priority until April 1

- On April 1, when the TDG waiver becomes effective, the B2CC will then be turned back on and operate through the spring season. Powerhouse priority will also switch back the BII powerhouse on April 1 (Scott Bettin noted one exception; on 4/10 there will be a B2CC outage for approximately 10 hours).

TMT Schedule

(NOTE: TMT will likely meet weekly during the month of March.)

The next TMT meeting will be: face to face on 3/17 at 9:00am and will be **held at NOAA in the St. Helens room, 10th floor.**

Agenda items will include:

- Notes Review
- The Dalles Spillwall Update
- Updated Weather and Flood Control Forecasts
- Water Management Plan Spring/ Comment Deadlines
- Chum Emergence Update
- 2010 Operations
- 2010 Initial Spill Priority List
- Transport Update
- Hanford Reach
- Operations Review

**Columbia River Regional Forum
Technical Management Team Conference Call
March 10, 2010**

1. Introduction

Today's TMT call was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting) with representatives of the COE, BPA, USFWS, NOAA, Idaho, Washington, the Spokane Tribe, CRITFC and others present. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Chum Emergence Update

Water supply data still indicates this will be a year of below-average flows, Paul Wagner (NOAA) reported. Chum emergence data show that Gages 1 and 2 have hit 825 temperature units, a relative estimate of when emergence should happen. Based on trends, it's hard to justify continuing to provide chum flows until March 10, so at this point NOAA recommends a step-down process that will gradually lower the Bonneville tailwater elevation in light of dwindling water supplies. The proposed chum flow schedule is as follows:

1. Effective on 0001 hours on Monday, March 15, 2010, operate Bonneville Dam to maintain a minimum Bonneville tailwater elevation of 11.0 feet.
2. Effective on 0001 hours on Wednesday, March 17, 2010, operate Bonneville Dam to maintain a minimum Bonneville tailwater elevation of 10.8 feet.
3. Effective 0001 Hours on Friday, March 19, 2010, operate Bonneville Dam to maintain a minimum Bonneville tailwater elevation of 10.5 feet.
4. Effective 0001 hours on Monday, March 22, 2010, transition to Vernita Bar minimum operations and the tailwater elevation that provides.

The reason for the gradual step-down is anecdotal evidence that chum move vertically in the water column, and such a schedule could allow them time to adapt to diminishing flows. If precipitation changes dramatically in the near future, NOAA might revise its recommendation. Stakeholders gave their views of the NOAA proposal (Oregon and Montana were absent today).

BPA – In favor.

BOR – In favor.

WDFW – A tough decision but the right call.

USFWS – Agrees with WDFW's position.

Idaho – No objection.

CRITFC – Supports NOAA's proposal.

Spokane Tribe – Supports NOAA's proposal.

The chum tailwater restriction will therefore end at 1 minute past midnight on March 22, barring a sudden change in water supplies. TMT will revisit this issue at its next meeting March 17.

3. Updated Water Supply and Flood Control Forecasting

There has been no significant change in the water supply forecasts since the last meeting, Barton reported. The RFC's March final forecasts are out:

- Grand Coulee – January-July volume: 75% of normal.
- The Dalles – 67% of normal, a drop of 2% from the early bird forecast.
- Lower Granite – April-July volume: 56% of normal.

The COE's final forecasts for March are also out:

- Libby – April-August: 70% of normal, or 5084 kaf, down from 5,478 kaf according to the February final forecast.
- Dworshak – 59% of normal, or 1,571 kaf for April-July, down from 1,742 kaf according to the February final forecast.

Flood control elevations are slightly higher at Libby, Dworshak, and Hungry Horse than they were in February, Barton reported. The Grand Coulee flood control elevation of 1,283.3 feet for March-April hasn't changed. The initial controlled flow – the estimated peak discharge, given the volume forecast, if no dams were present – is now down to 200 kcfs, a reflection of the deteriorating water supply forecast. Dave Wills (USFWS) asked about differences between the COE and RFC predictions, particularly for Dworshak Dam. That has to do with differences in how the two models treat and weigh observed snow and precipitation, Barton replied.

4. Draft 2010 Fish Operations Plan

The draft 2010 FOP is now posted to the TMT web page for review, Dan Feil (COE) said. It is mostly consistent with spring 2009 operations per the court order, covering operations from April 3 to June 20, 2010. Operations not covered in the FOP can be found in the 2008 BiOp, the current Water Management Plan, or the current Fish Passage Plan. The WMP and FPP are both up to date, posted to the TMT website.

For the most part, the 2010 FOP is a rollover of court-ordered operations for 2009. The document covers spill operations, TDG management, minimum generation at the projects, low flow operations, juvenile fish transportation plans, a project-by-project description of research activities that could affect spill, and operational considerations for each project.

The 2010 transport operation is identical to last year for flows above 65 kcfs, with a start date from April 20-May 1 at Lower Granite and subsequent start dates of 4 and 7 days later at Little Goose and Lower Monumental, respectively. If seasonal flows are less than 65 kcfs, NOAA proposed a maximum transport operation beginning May 1 at Lower Granite, with subsequent start dates 7 days later at Little Goose and Lower Monumental.

Under the 2010 FOP, transportation will occur April 3-June 20 at the Snake River projects; April 10-June 19 at Columbia River projects; April 10-end June at John Day and The Dalles dams; and April 10-June 20 at Bonneville Dam. These dates are identical to last year.

There are a few differences from last year, starting with the low-flow transport operation proposed by NOAA. On March 12, ISAB will review NOAA's proposal for seasonal flows of less than 65 kcfs. The COE will then make a determination on transport operations if flows are less than 65 kcfs at Lower Granite – which there's every indication they will be.

Another difference this year will be delayed installation of fish screens (from April 1 to April 15) at McNary Dam for the benefit of juvenile lamprey. Yet another change from the 2009 operation is that Lower Monumental Dam will use only a bulk spill pattern in 2010. Last year's research on uniform vs. bulk spill indicated that dam survival is slightly higher with bulk spill.

Once the FOP has been finalized and approved by the court, it will be posted to the TMT page as appendix E of the Fish Passage Plan. Send substantive (not editorial) comments on the FOP to Feil by noon March 12.

5. Bonneville 2nd Powerhouse Corner Collector Operation for Kelts

The March kelt operation of the Bonneville corner collector has been under discussion for some time, Feil reported. The operational trigger developed in FPOM to open the B2CC has been slightly modified. In 2010 the B2CC will be opened when 2 kelts have been observed on 2 consecutive days, plus a total of 20 fish observed at the Bonneville 2nd powerhouse behavioral guidance structure.

With 2 kelts already seen in the area, the plan is to open the corner collector within 14 hours of observing 20 fish at the BGS. Until April 1, exceedances of 105% TDG saturation at the Warrandale gage will cause the corner collector to be shut off and the project to operate with a 1st powerhouse priority for the rest of March. The reason for this is operation of the corner collector can cause TDG levels at the Warrandale gage to rise, and the state waiver allowing levels to exceed 105% TDG doesn't kick in until April 1.

Scott Bettin (BPA) noted that the corner collector could be shut down for 10 hours on April 10 for maintenance, the subject of an upcoming FPOM discussion. There will be a Spring Creek Hatchery release on April 12, Dave Wills said. There is no longer a March release due to hatchery reprogramming.

6. Next Meeting

The next TMT meeting will be at NOAA's Portland office on March 17. The agenda will include updates on the water management issues discussed today, The Dalles spill wall construction, the Water Management Plan spring/summer update, the 2010 spill priority list, transport operations, protection flows at Hanford Reach, and the usual operations review. This summary prepared by technical writer Pat Vivian.

<i>Name</i>	<i>Affiliation</i>
Dan Feil	COE
Dennis XX	Seattle City Light
Tony Norris	BPA
Steve Hall	COE Walla Walla
Irene XX	Puget Sound Energy
Richelle Beck	DRA
Greg Lawson	Pt. Carver
Shane Scott	PPC
Dave Wills	USFWS
Paul Wagner	NOAA
Russ Kiefer	Idaho
XX	Snohomish PUD
Charles Morrill	WDFW
Tom XX	CMDC Power
Deanne Kunkel	Spokane Tribe
Sherry XX	Puget Sound Energy
John Roache	BOR
Steve Barton	COE
Kyle Dittmer	CRITFC
Scott Bettin	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
WDFW : Cindy LeFleur / Charles Morrill **MT** : Jim Litchfield / Brian Marotz
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday March 17, 2010 09:00 - 12:00

NOAA Fisheries
1201 N.E. Lloyd Blvd., Suite 1100
Portland, Oregon 97232-1274
Map Quest [\[Directions\]](#)

Mt. St. Helens Room, 10th Floor Conference Room

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

> 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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for March 3 & 10, 2010 [\[Meeting Minutes\]](#)
3. The Dalles Spillwall Update - Steve Barton, COE-RCC
4. Updated Weather and Flood Control Forecasts - Steve Barton, COE-RCC
 - a. [Westwide SNOTEL](#)
5. Water Management Plan Spring/Comment Deadlines - Steve Barton, COE-RCC
6. Hanford Reach Update - Russell Langshaw, Grant County PUD
7. Chum Emergence Update - Paul Wagner, NOAA Fisheries
 - a. [Ives 1](#)
8. 2010 Operations - Steve Barton, COE-RCC
 - a. Bonneville Powerhouse 2 Corner Collector (B2CC) Operations
 - b. Low Q Spill Operations (BON & MCN)
 - c. LSN Drafting to MOP
9. 2010 Initial Spill Priority List - Scott English, COE-RCC
 - a. [Setting Spill Priority](#)
 - b. [Revised Spill Priority List](#)

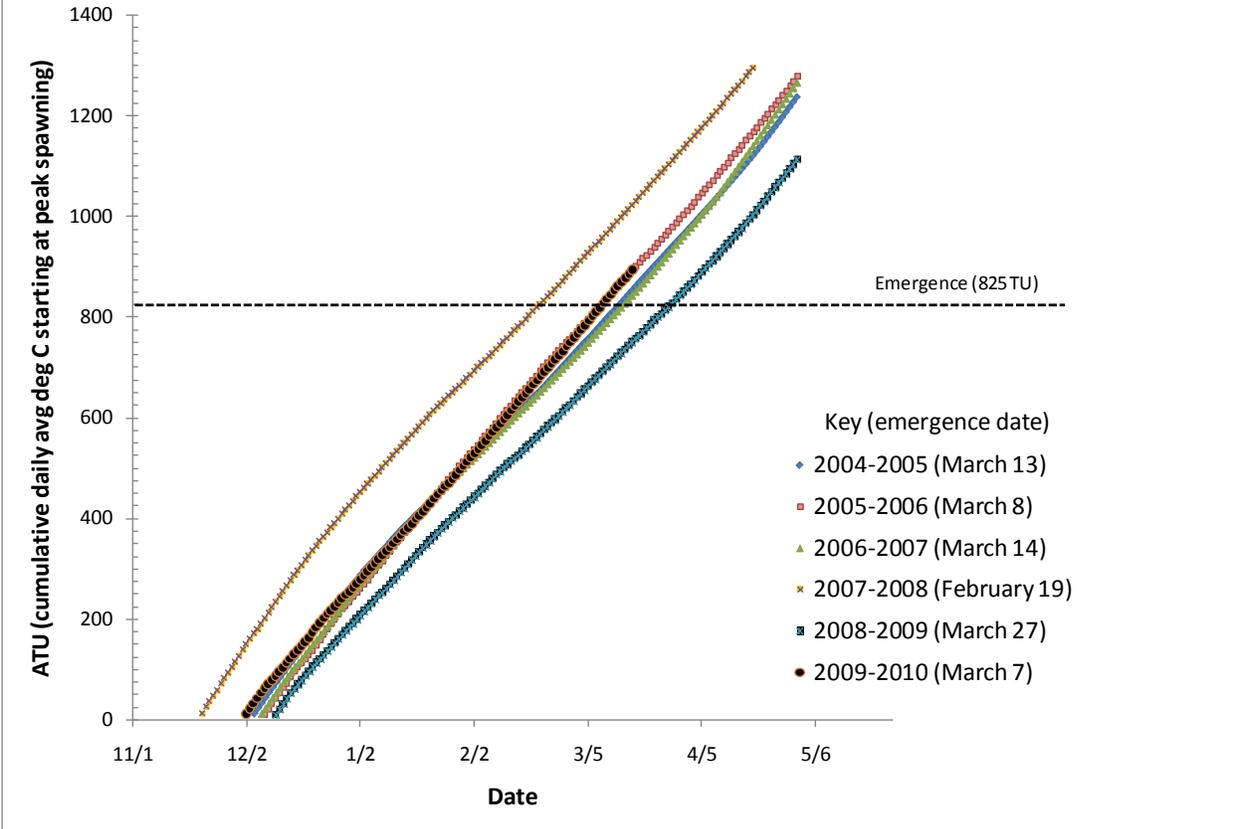
10. Transport Update - *Paul Wagner, NOAA Fisheries*
 - a. ISAB Review
11. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality
12. Other
 - a. Set agenda and date for next meeting - **March 31, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

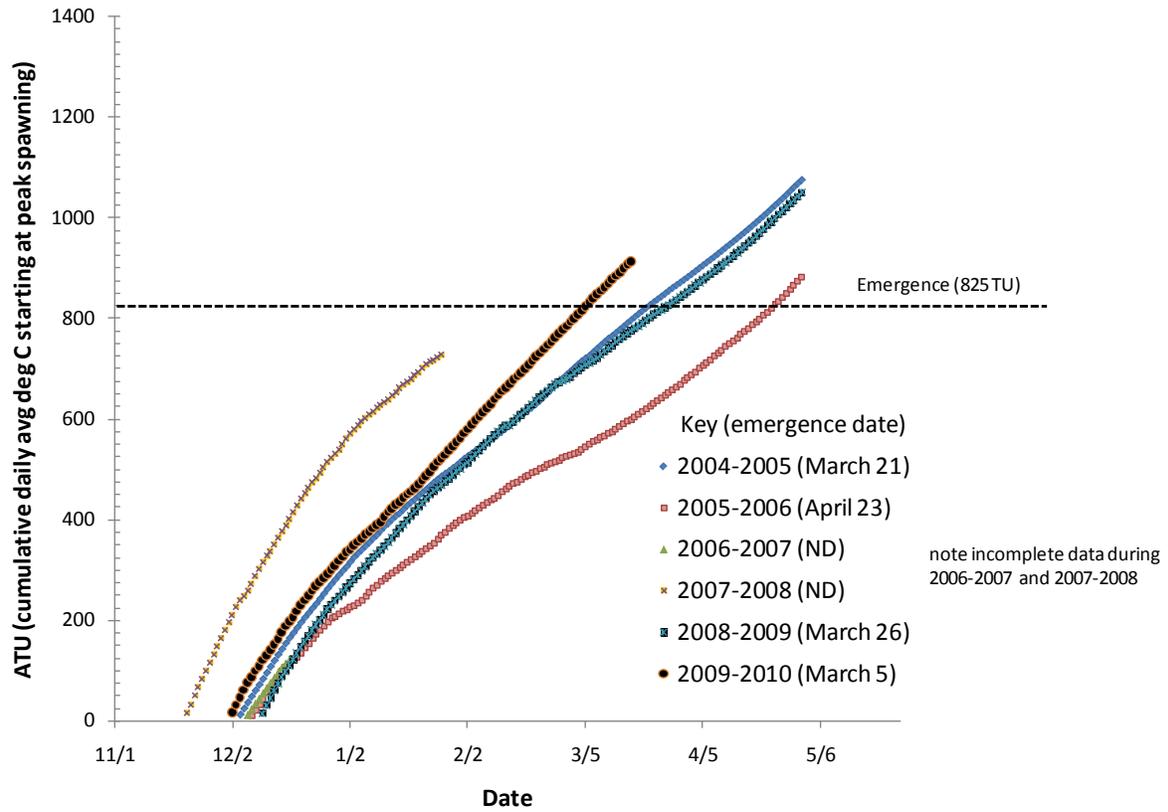
[Steve Barton](#) at (503) 808-3945, or

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

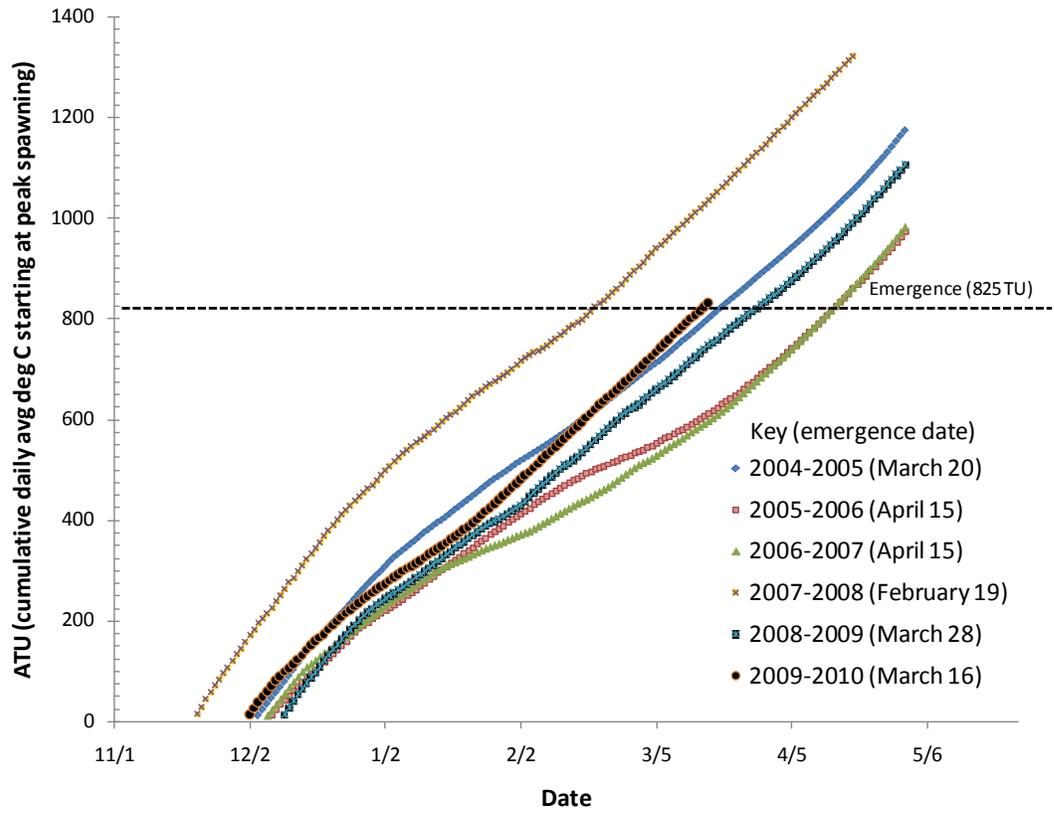
Ives 1 (2004-2010)



Ives 2 (2004-2010)

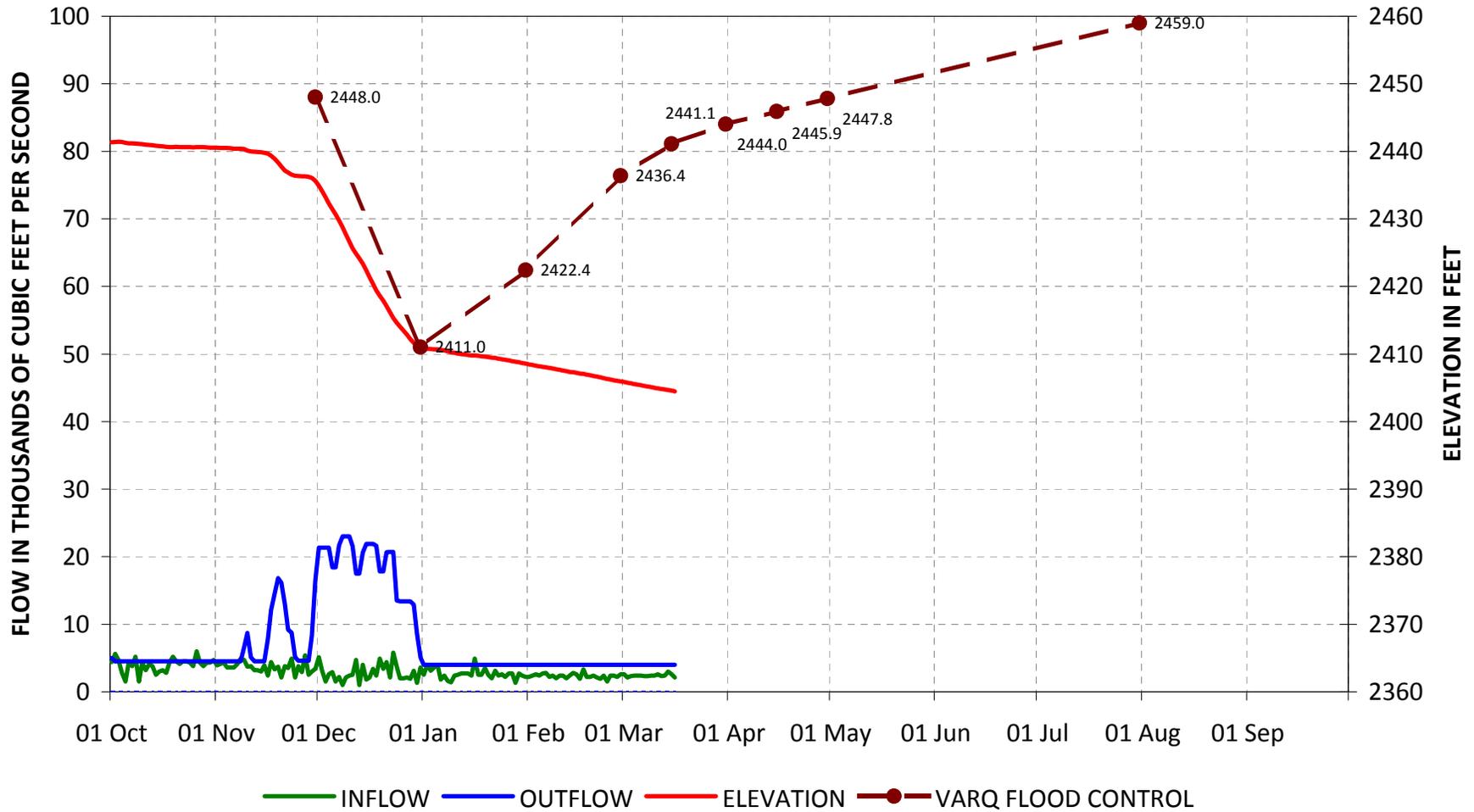


Ives 3 (2004-2010)



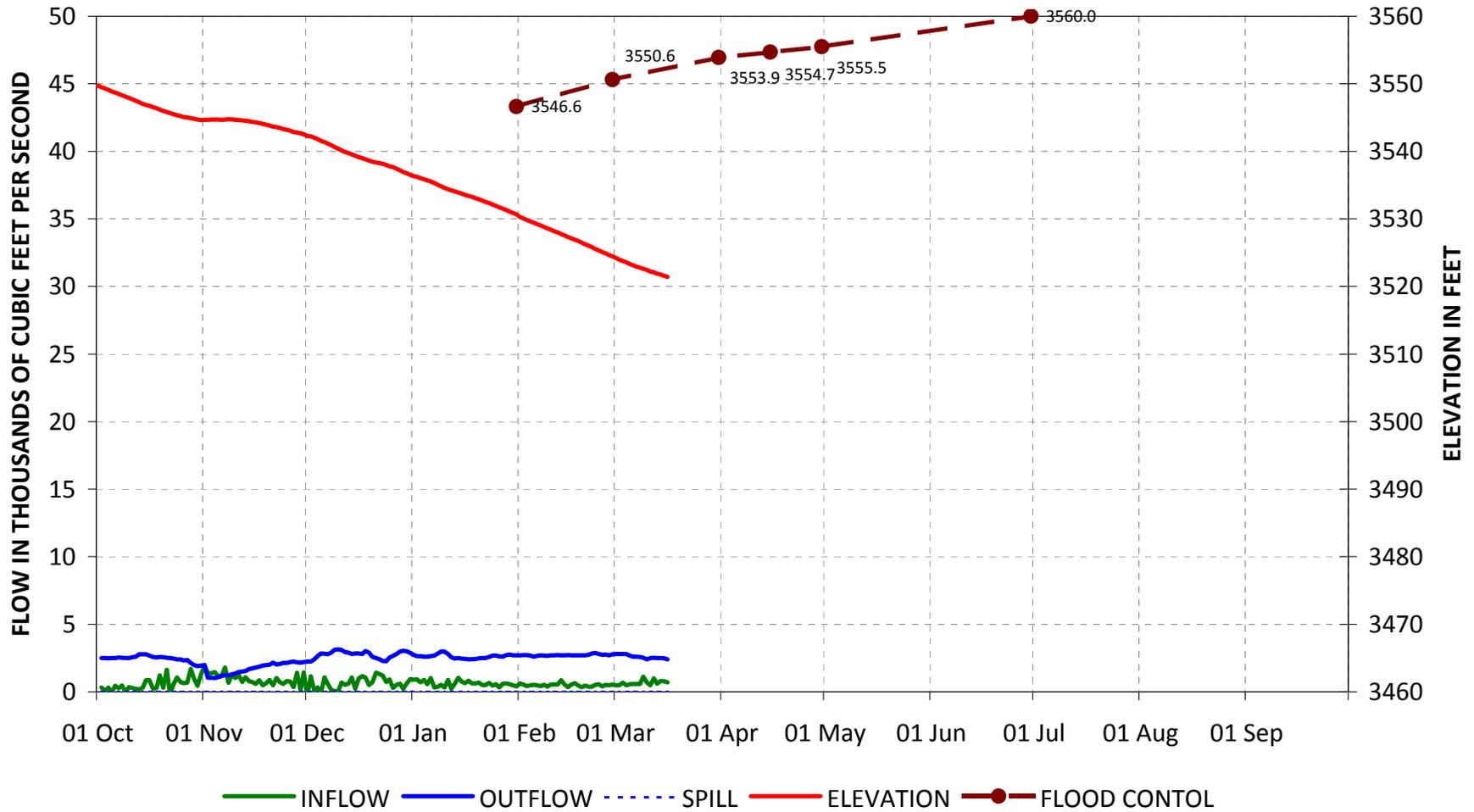
LIBBY DAM AND RESERVOIR

Water Year 2010



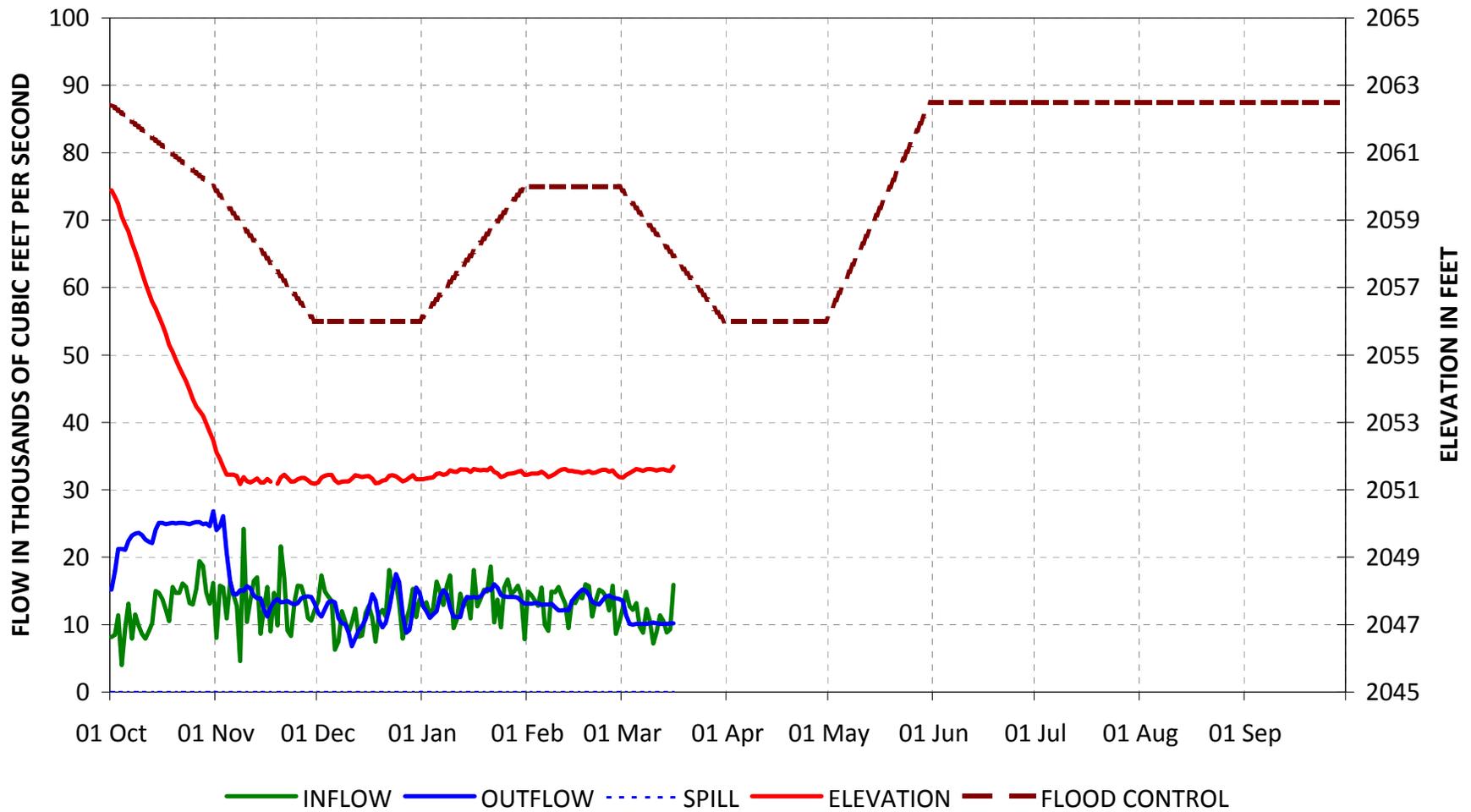
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



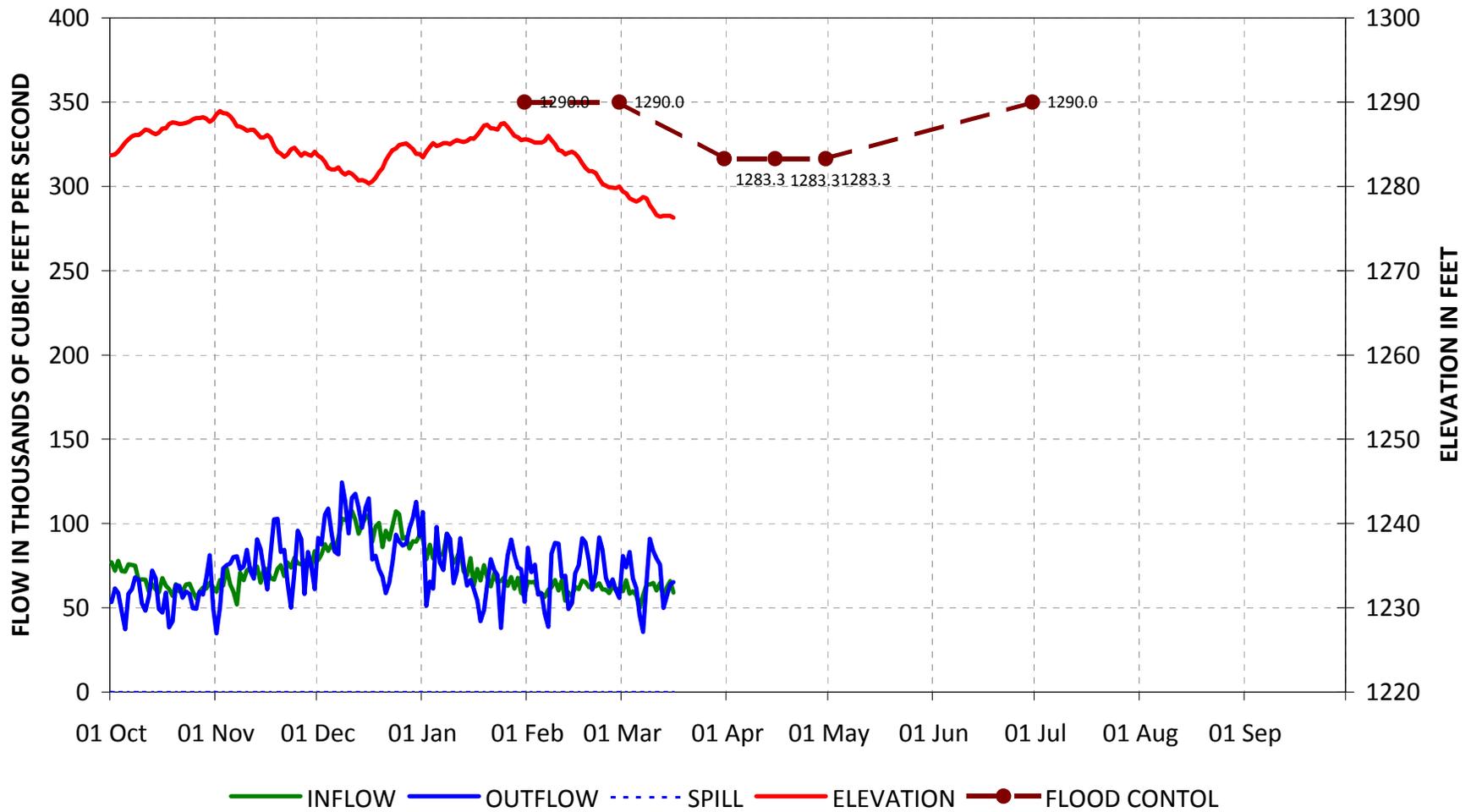
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



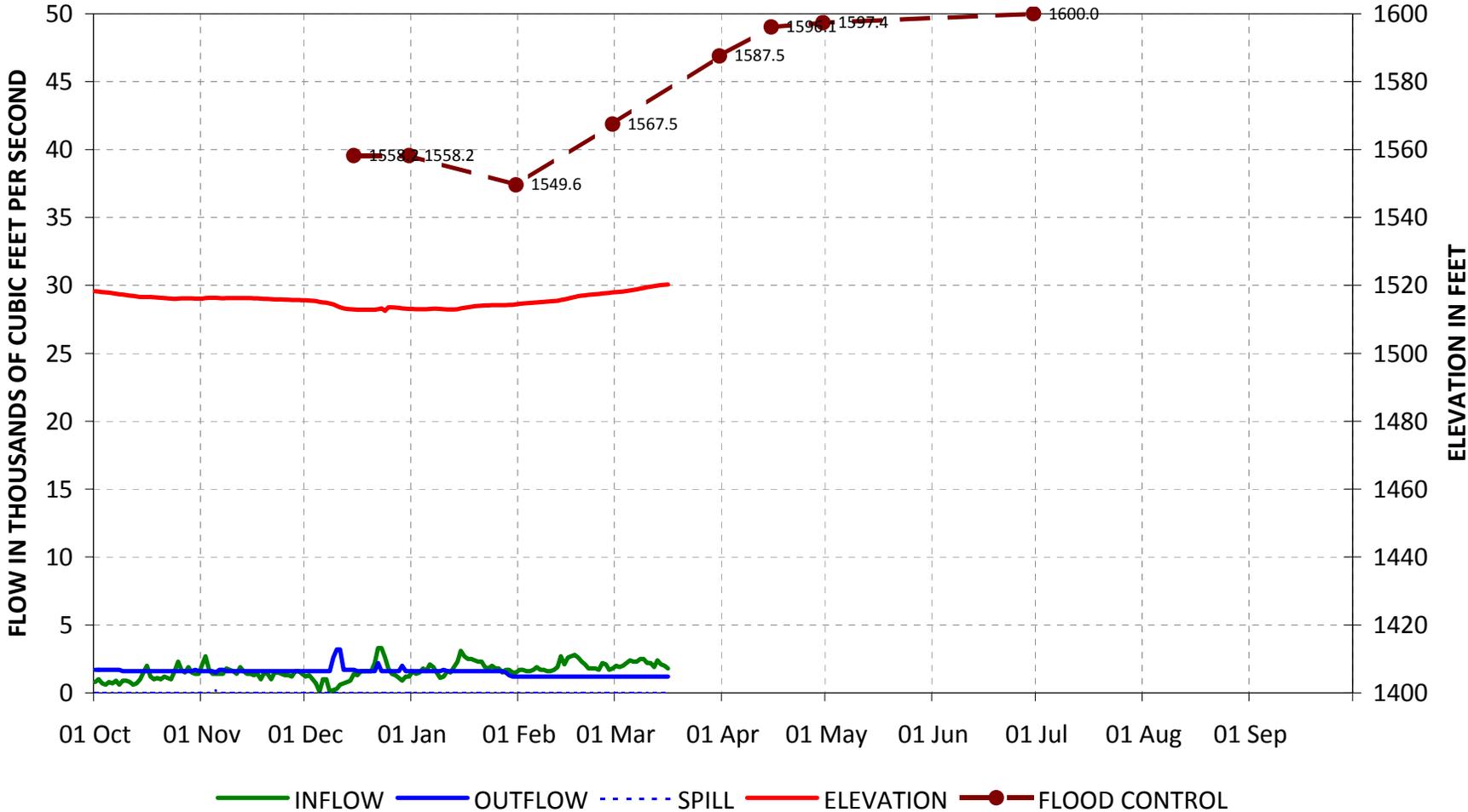
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



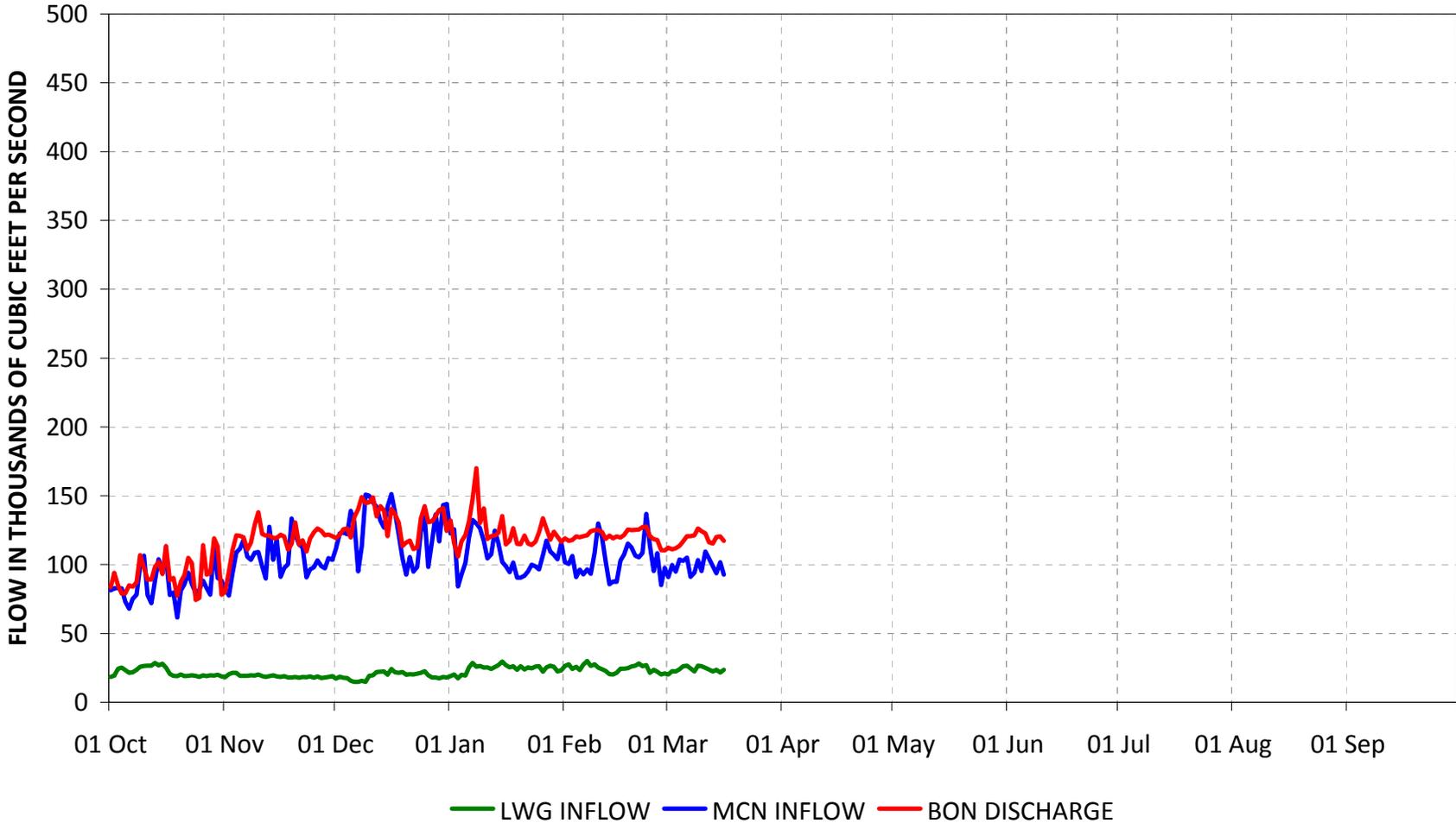
DWORSHAK DAM AND RESERVOIR

Water Year 2010



LOWER SNAKE AND LOWER COLUMBIA RIVER FLOWS

Water Year 2010



XX
BON R 040110 1330 CO AND SN

ATTENTION: COLUMBIA RIVER BASIN PROJECTS AND BPA
SUBJECT: REVISE SPILL PRIORITY LIST

**** REVISED SPILL PRIORITY
**** INITIAL SPILL CAPS FOR 2010 SPILL SEASON

1. THIS TELETYPE PROVIDES GUIDANCE ON PROJECT OPERATION TO PROVIDE VOLUNTARY AND INVOLUNTARY SPILL.
2. UNTIL FURTHER NOTICE DURING PERIODS OF INVOLUNTARY SPILL PROJECTS SHOULD SPILL IN THE FOLLOWING ORDER: LWG,LGS, LMN,IHR, WAN,WEL,RRH,RIS,PRD,MCN,JDA,BON,CHJ, GCL & DWR, TDA.
3. CURRENT SPILL CAPS FOR THE VARIOUS TDG LEVELS, SUBJECT TO PERIODIC CHANGES BASED ON REAL-TIME DATA. VOLUNTARY AND INVOLUNTARY SPILL SHOULD BE IN THE FOLLOWING ORDER.

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

LWG----20--30---41---90--125---200-- * Changes
LGS----10--15---32---80--150---250--
LMN(A)--10--15---26---95--180---250--
LMN(B)--10--15---30---95--180---250--
IHR----30--45---95---125--180---240--
WEL----10--15---25---45--130-----
RRH----05--10---20---30--150-----
RIS----05--10---20---30--150-----
WAN----10--15---20---50--100-----
PRD----20--30---40---40--40-----
MCN----40--80---145---230--290---450--
JDA----20--60---120---240--450---600-
TDA----20--60---125---250--360---600--
BON----50--65---100---150--225---270-
CHJ----40--70---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%-----

4. SPILL CAPS FOR DWR ARE LISTED IN TERMS OF PERCENTAGE OF TOTAL OUTFLOW.
5. WHEN GRAND COULEE FOREBAY ELEVATION IS LESS THAN 1266 FT USE GCL(a) SPILL CAPS ASSOCIATED WITH OUTLET TUBES. WHEN GRAND COULEE FOREBAY ELEVATION IS GREATER THAN 1265.5 FT, USE GC(b) SPILL CAPS ASSOCIATED WITH DRUMGATES.
6. AT LMN, USE LMN(A) SPILL CAP WHEN USING THE "BULK" SPILL PATTERN. USE LMN(B) SPILL CAP WHEN USING THE "UNIFORM" SPILL PATTERN.
7. CHIEF JOSEPH SPILL CAPS ARE ESTIMATES.
8. IF AFTER HOURS WATER QUALITY ASSISTANCE IS NEEDED, CONTACT

Setting Spill Priority

At least once during spill season, the Corps Water Quality Team develops a spill priority list that gives the order of which dams should spill first in the event of involuntary spill. This list may change several times during the spill season depending on river conditions and other circumstances. The spill priority lists are discussed in the TMT regional forum. When establishing the order of which dams should spill first in the event of involuntary spill, the following factors are what the Corps considers:

- Location of Fish: Consider where the fish are. If TDG levels are at or below 120% with high involuntary spill put the projects with the most fish first on the priority list so the fish are benefited the most with the high spill and flows.
- Location of High TDG: When TDG levels are above 120 % with high involuntary spill, put the projects with the most fish last on the priority list so the fish are harmed the least with the high spill and flows.
- Location of Fish Studies: Consider where there are special fish studies and put those projects low on the priority list so the studies can remain intact as designed.
- River Reaches: Consider projects in one of three blocks: Lower Snake; Lower Columbia and Middle Columbia. For example, if several Lower Snake projects need to be moved to low priority on the list, then move the whole block of projects (LWG; LGS; LMN and IHR) to the last.
- Special Operations: Place projects with special operations such as maintenance or project gate malfunctioning last on priority list.
- Collector Projects: During low flow years, place the collector projects (LGS; LWG; LMN; MCN) low on the priority list so that spill is away from them.
- Special Fish Conditions: If there are special fish conditions, such as disease or a special release, then move the project to first place on the priority list so the fish receive the maximum spill.

It is important that the Corps the RCC, Fish Unit is consulted when new spill priority lists are developed and that the proposed spill priority list are discussed in the Regional forum of the Technical Management Team meetings.

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 17, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 March 3rd and 10th, 2010

Paul Wagner, NOAA, had some changes to the March 3rd official meeting minutes:

- Page 8, under Chum Emergence Update section, paragraph two, last sentence: "several miles" should be changed to as "100 miles." In paragraph four: "per the BiOp" should read "per the Vernita Bar Agreement."
- Page 10, under Transport Update section, in the first paragraph, fourth sentence: "April 3rd-May 1st" should be changed to "beginning April 3rd". The last sentence in the paragraph should be changed to read "no spill at collector projects in the Snake River during spring migration season."

No other changes to the facilitator's summary or official meeting minutes were made and both sets will be considered final.

The Dalles Spillwall Update

Steve Barton, COE, reported that the project passed final inspection on Thursday. Barton reported that there was a minor repair at The Dalles that required time to cure, but normal operations should be restored on by 3/18. Bonneville operations had already returned to a normal range.

Updated Weather and Flood Control Forecasts

Steve Barton, COE, announced that the mid-month update is due out 3/18. The March final forecast assumed precipitation to be 75% of normal for the remainder of March, but Barton reported that the Basin as a whole is at 64% of normal precipitation as of March 15 for the Columbia River above The Dalles. Barton referred TMT to SNOTEL data (posted as a link to the agenda) reporting levels below to much below normal (50-80% of normal) through the entire basin. The outlook calls for temperatures to remain above normal and precipitation to remain below normal.

Kyle Dittmer, CRITFC, shared an update from the NOAA Research Center in Boulder, CO, reporting that El Niño will continue its peak through spring. He noted that historically, an El Niño peak has not been this late since the 1950's.

Water Management Plan Spring/Summer Update - Comment Deadlines

Steve Barton, COE, advised TMT members that the initial draft has been posted to the TMT site. He encouraged TMT members to provide feedback and outlined a proposed comment period including intermediate deadlines. The initial comment deadline is set for April 10th. The COE requests that the bulk of the substantive comments be submitted by this date if possible. A revised draft will be shared by the COE by April 30th. A final comment period will be open until May 7th and the final draft will be shared on May 15th. There were no comments/ questions from the group regarding this process.

Action/Next Steps: Substantive comments can be sent to Doug Baus and Steve Barton. Comments should be submitted in a word document with redline formatting.

Chum Emergence Update

Paul Wagner, NOAA, directed TMT to Ives Island data, posted as a link to the agenda. He explained the results of the three gauge readings; gauge number one hit the targeted 825 10 days ago, gauge number two hit the targeted 825 on March 15th and is now above 900, gauge number three hit the targeted 825 on March 16th. He reminded TMT of the agreed upon step down scenario at Bonneville. On Monday March 15th, operations moved to 11.0' tailwater elevation. On Wednesday March 15th, operations moved to 10.8' and on Friday March 19th, operations are scheduled to move to 10.5' tailwater elevation, finally transitioning to Vernita Bar minimum operations on Monday March 22nd.

Wagner noted that the next issue facing chum is maintaining connectivity at Hamilton Spring and Hamilton Creek. Though he does not expect any issues, he is organizing monitoring surveys over this weekend, when the salmon managers and others will physically visit the sites to observe and verify whether there are any connectivity issues during low flow conditions. The group discussed the relation between tailwater elevation and connectivity and some options for controlling any connectivity issues that may arise, such as shaping the draft at John Day to maintain desired tailwater levels. Steve Barton, COE, reminded TMT that there may be opportunities during upcoming scheduled maintenance times when water may be available; he will check internally with the COE for upcoming options for water flexibility. Tony Norris, BPA, said that BPA would like to know of any upcoming constraints as soon as possible.

Action/Next Steps: NOAA, along with USFWS and WDFW, will survey the Spring/Hamilton Creek areas over the weekend and early next week and report any issues to TMT as quickly as possible. TMT will discuss updates on this item during a conference call on 3/24.

Hanford Reach Update

Russell Langshaw, Grant County PUD, reported to TMT that rearing protection flows began on March 3rd. He reported that temperatures are warmer and flows lower than normal. Since March 3rd, there have been eight 20 kcfs restriction days and four 30 kcfs restriction days.

Action/Next Steps: Langshaw will present updated fall Chinook emergence data at the TMT meeting on 3/31.

2010 Operations

Steve Barton, COE, reported on the following:

- **B2CC Operations:** Barton followed up on an email to TMT members earlier in the week by reporting that the B2CC had just been re-opened at 8 am on 3/17, but the ice and trash sluiceway and spillbays 1 and 18 will remain closed. Barton clarified that the COE will monitor the TDG levels closely if they exceed 105%, the COE will shut off the B2CC. He said it is uncertain whether the attraction flows will be turned back on and said that it will be a very dynamic operation between now and April 1, when the TDG waiver goes into effect. TMT members noted that this issue is being discussed at FPOM and FPAC, and there is some question as to whether there is a significant problem with adult passage without the attraction flows in effect. The COE stated that they are trying to manage the project the best they can to support migration and suggested that TMT could revisit this item during a conference call on 3/24. **Action:** TMT will discuss this item during a conference call on 3/24.
- **Low Flow Spill Operations:** Barton reported on the latest STP runs for Lower Granite, which indicated flows are likely to stay in the mid-20 kcfs range as the spill season begins; this means Little Goose will likely enter the season with the spillway weir closed, and will spill according to Table LGS-12 in the Fish Passage Plan (FPP). **Action:** Russ Kiefer, ID, reported that FPAC is coordinating a draft recommendation/FPP change form to provide better conditions for fish passing the project, which will be vetted with FPOM before it is submitted to the COE.

Additionally, the COE gave TMT a head's up that early-mid April inflows at McNary look to be in the range of 92-100 kcfs, which will mean that spill will likely be in the 35-40 kcfs range. Early-mid April inflows at Bonneville look to be in the range of 105-155 kcfs range, which will mean that spill will likely be in the range of 70-75 kcfs.

The COE also clarified that modeling for Priest Rapids flows and targets for April assumed that Vernita Bar minimums would be in effect until about April 20. BPA said the flow objective is 135 kcfs for April 10-20 (the minimum flow is 60 kcfs per the Vernita Bar Agreement.) **Action:** The Salmon Managers will discuss this item and if they have ideas for a different recommendation, they will send it along to the Action Agencies.

- **Lower Snake River Drafting to MOP:** Barton reported that the COE is targeting April 3rd for drafting the Lower Snake River projects. In 2009, Little Goose operations were able to maintain MOP/ MOP + 1; so far for 2010, indications are that the project should be able to maintain MOP/MOP+1 as well, and discussion with Walla Walla District staff will be ongoing. Paul Wagner, NOAA, noted that

MOP operations have been discussed at FPAC and said that if the COE identifies any bump/volume of water that could be passed at a time that would support spring migration, to please share that with TMT as soon as possible. TMT members, including the COE, were open to the idea of discussing a potential push back of the April 3rd date, which would be possible if there was consensus amongst all TMT members. **Action:** This issue will be revisited next week during the 3/24 TMT conference call.

2010 Initial Spill Priority List

Scott English, COE, directed TMT to two documents, both posted as links to the agenda. He described the first, Setting Spill Priority, as guidance to spring spill priority and the second, Revised Spill Priority List, as a proposed list that has been reviewed by the RCC fish unit. Steve Barton, COE, clarified that these documents are not yet final and that there are edits expected. Paul Wagner, NOAA, reported discussing spill priority with the mid-Columbia coordinator, who suggested spill at the lowest project (Priest Rapids) first. Tony Norris, BPA, reminded TMT members to also review the Emergency Actions List, which is an appendix to the Water Management Plan.

Action/Next Steps: FPAC will discuss these lists at their next meeting, and TMT will discuss them at the next face-to-face meeting on March 31st.

Transportation Update

Paul Wagner, NOAA, reported that reports from NOAA and Oregon were submitted to the ISAB on 3/12.

Action/Next Steps: The ISAB will review the information and their comments are expected back by April 9th. For those who are interested, the presentation is on the ISAB website.

TMT will continue to track and discuss this issue at future meetings.

Operations Review

Reservoirs: Grand Coulee was at elevation 1276.3' and meeting chum needs until next Monday 3/22 when operations will transition to Vernita Bar minimums. Hungry Horse was at 3521.4', with 2.4 kcfs outflow. Libby was at elevation 2404.48', with 2.5 kcfs inflows and 4.0 kcfs outflows (on minimums with slow but steady draft.) Albeni Falls was at 2015.69' and passing outflows of 10.2 kcfs. Dworshak was at elevation 1520.34' with inflows of 2.0 kcfs and outflows of 1.2 kcfs (on minimums, slowly filling.) Lower Granite inflows were at 23.7 kcfs, McNary inflows were at 92.6 kcfs (averaging just under 100 kcfs.) and Bonneville inflows were at 117.3 kcfs (averaging 120 kcfs.)

Fish Paul Wagner, NOAA, directed TMT to the Fish Passage Center's smolt data/ two week passage index. He reported for juveniles: smolt traps are catching some migrating wild and hatchery fish and passage numbers have been in the 20 per day range for the past week (still early in the season.) Subyearlings were in the 500 per day range, with no hatchery releases yet. Coho passage numbers were in the 30 per day range. Adults were seeing 2-9 Spring Chinook per day at Bonneville (seven passed the project on 3/16.) Steelhead were looking a bit above average so far, in the range of 100-140 per day.

Power Tony Norris, BPA, noted that the installed wind capacity has increased to 2780 megawatts. TMT looked at tracking information on a 7-day generation data graph posted on the BPA wind generation site linked to the TMT homepage.

Water Quality: Scott English and Laura Hamilton, COE, noted that forebay gauges are being prepped for spill season. Steve Hall, COE, noted that TDG spiked over 110% at Dworshak on 3/16. Generation was increased by 0.4 kcfs to try and control levels (increasing generation decreases gas). Operators are not sure what caused the spike. Temperature and spill data will be analyzed and gauges checked and monitored for more information.

English and Hamilton walked TMT through the new RCC Water Quality Program website. They noted the Oregon, Washington, and OR/WA combined reports to account for the different standards and reporting processes specific to each state. Hamilton explained that OR uses the highest hour reading and Washington uses a running/ consecutive 12 hour average. They shared that the site contains data on six major water quality categories: Policies, Meeting Summaries, Water Quality Plans, Reports, Spill Plans and other general information.

The next TMT meeting will be: a conference call on **3/24 at 9:00am.**

Agenda items will include:

- B2 Corner Collector Status
- Lower Snake Drafting to MOP

The following TMT meeting will be: a face-to-face **3/31 at 9:00am at the COE.**

Agenda items will include:

- Notes Review
- Updated Weather and Flood Control Forecasts
- Chum Surveys re Connectivity
- 2010 Operations
- Spill Priority List/ Emergency Actions
- TDG Instances/ Definition Changes
- Priest Rapids Update
- Operations Review

**Columbia River Regional Forum
Technical Management Team Meeting
March 17, 2010**

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting) with representatives of BOR, COE, Washington, CRITFC, USFWS, Idaho, Montana, NOAA, BPA, Oregon and others present. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for March 3 and 10

Paul Wagner (NOAA) made three changes to the March 3 official minutes:

(1) In the Chum Operations Update, page 8, 2nd paragraph, the last sentence should read: "The other large spawning area for chum is at the Grays River, separated from Ives Island by about 100 miles."

(2) Also in the Chum Operations Update, 4th paragraph, the first two sentences should read: "Another consideration is providing Vernita Bar protection flows. These can drop to 55 kcfs or no more than 50% of prior protection levels per the Vernita Bar agreement."

(3) In the Transport Update, page 10, 1st paragraph, the fourth sentence should read: "The BiOp says that when total river flows go below 65 kcfs, transportation should begin on April 3, with no spill during the spring migration season." Jim Litchfield (Montana) amended the sentence to read: "The BiOp says that when total river flows go below 65 kcfs, transportation should begin on April 3, with no spill at collector projects during spring migration season in the Snake River." These changes will be made and the notes reposted.

3. The Dalles Spill Wall Update

The completed wall passed final inspection on March 11, Barton reported. On March 12, the project manager asked the COE to terminate the deviation request allowing a high forebay elevation at Bonneville to facilitate spill wall construction.

The old wall at The Dalles was recently damaged by a barge, and spill will be turned off until the repair is completed on March 18.

4. Updated Water Supply and Flood Control Forecasts

The COE will release an updated water supply forecast on March 18. The March final forecast assumed 75% of normal precipitation, but as of March 15,

precipitation averaged only about 64% of normal throughout the Columbia basin. The drop could nudge the water supply forecast even lower. The January final water supply regression forecast for March was 71.8% of normal. By comparison, as of March 15, precipitation from Grand Coulee to The Dalles was only 64% of normal, and 63% of normal above Grand Coulee.

Snowpack continues to be below or significantly below normal throughout the basin – 50-67% of normal in northern Idaho and western Montana, and 50-85% of normal elsewhere. In Canada, the Kootenai River basin snowpack is 60% of normal, while the upper Columbia basin is 77-83% of normal. Only the extreme north near Mica Dam has a near-normal prediction of 97%.

Kyle Dittmer (CRITFC) said the latest meteorological information is similarly discouraging. The multi-variable ENSO index shows the El Nino trend increasing, which hasn't happened since the winter of 1957-58. Unless there's a major shift, conditions don't look good for spring migrants.

5. Water Management Plan Spring Comment Deadlines

Barton proposed and TMT agreed to the following schedule for review of the draft WMP spring/summer update. Email comments to Doug Baus and cc: Steve Barton.

- **April 10** – Comments due on draft WMP spring/summer update, available at the TMT website in both PDF and Word format. Redlined comments are welcome. The COE wants all substantive comments by this deadline.
- **May 7** – Second round of comments due on revised draft.
- **May 15** – Final WMP spring/summer update posted to the TMT website.

6. Hanford Reach Update

Russell Langshaw (Grant PUD) gave his first report of the season on protection flows at Priest Rapids Dam. With temperatures warmer than usual, emergence began unexpectedly early, and rearing operations began on March 3, a few days after emergence. Spawning is still in its early stages. Since March 3, there have been 8 days of 20 kcfs flow restrictions and 4 days of 30 kcfs restrictions. Langshaw will provide another update at the March 31 TMT meeting.

7. Chum Emergence Update

Paul Wagner (NOAA) presented data, linked to today's agenda, from the three gages being used to monitor accumulation of temperature units in the Ives Island spawning area. Gage 1 recorded 825 TUs on March 7; gage 2 recorded 825 TUs on March 5; and gage 3 recorded 825 TUs on March 16. Accumulation of 825 TU's provides a relative estimate of when emergence should occur.

The peak spawning count was 100 chum in the Ives Island area and another 200 in the Hamilton Creek/Hamilton Springs area. Following the step-

down schedule TMT adopted in last week's call, the Bonneville tailwater elevation dropped to 11 feet on March 15 and to 10.8 feet today. On March 19, it will drop again to 10.5 feet in an effort to conserve water for spring migrants.

With chum emergence still in progress and elevations declining, NOAA developed an informal tag team to monitor the connectivity of Hamilton Springs and Hamilton Creek to the mainstem Columbia River. The creek – which is also subject to tidal effects – is expected to remain connected to the river, but that should be verified. Further coordination of monitoring by NOAA, USFWS and the state of Washington will occur at FPAC meetings.

Although the Bonneville tailwater elevation for chum is unsustainable, the COE might have opportunities to schedule water releases between now and April 10 for maintenance needs so they coincide with fish needs, Barton noted.

BPA needs to know the operating constraints for fish after March 22 in order to respond most effectively, Tony Norris (BPA) said. He asked that tailwater elevations and times be recorded during the Hamilton Creek site visits. TMT will discuss the chum operation again on March 31.

8. 2010 Operations

a. Bonneville 2nd Powerhouse Corner Collector. Barton reported that on April 14, the trigger for opening the corner collector was reached – 2 kelts observed per day for 2 consecutive days, plus a total of 20 fish at the 2nd powerhouse behavioral guidance structure.

The COE opened the B2CC on April 14, and the Warrandale gage read 105% TDG. Shortly after the B2CC opened, gas levels rose above the 105% state standard, and the COE shut off attraction flows in bays 1 and 18 as well as the ice and trash sluiceway. Nevertheless, gas levels continued to climb. On April 16 at 10:42 am, the COE closed the corner collector. The project operated on a 2nd powerhouse priority throughout this period.

This morning the Warrandale gage reading was down to 103% TDG with attraction flows turned off and the sluiceway closed, so the COE opened the corner collector again at 8:15 am. The sluiceway and attraction flows remain off. Operating the corner collector by itself tends to raise gas levels by 2-3%, so that operation might be sustainable. The COE will check in 24 hours to ensure that gas levels remain below the 105% state water quality standard, which will be in effect until April 1 when the spill waiver kicks in. If gas levels exceed 105% before April 1, the corner collector will be closed and TMT will consider next steps.

Whether attraction flows are turned back on remains to be seen, Barton said. Previously the salmon managers agreed to a tradeoff: Stop attraction flows for adults migrating upstream if needed to keep the corner collector open for kelts. Scott Bettin (BPA) said it's possible to provide attraction flows from just bay

1 or 18, not both. Russ Kiefer (Idaho) said an important consideration is whether spillway attraction flows are needed for adult passage; Idaho places a high priority on not delaying adults. Despite the warmer weather, this year's runs don't appear to be passing early, Cindy LeFleur (Washington) said. Kiefer suggested turning attraction flows back on if the B2CC must be closed again.

Scott English (COE) showed TMT members how to monitor whether the B2CC is operating at any given time. From the RCC water quality link on the TMT page, go to historical water project data, then pull up the chart for Bonneville. If flows are above 5.9 kcfs, it indicates the B2CC is operating. Attraction flows from bays 1 and 18 account for 2.4 kcfs.

TMT scheduled a potential conference call on March 24 to revisit this issue, with email updates to TMT members in the interim if needed.

b. Low-Flow Spill Operations. We can expect flows in April 2010 to be characteristic of the low flows of summer, Barton said. McNary and Bonneville dams will be most affected, but other project operations will be affected as well.

One of these is Lower Granite. Current STP traces suggest that inflows in April will remain around 25 kcfs. This raises concerns about the Little Goose operation downstream, where low flow conditions require toggling back and forth between 1 and 2 units within 1% peak efficiency for the sake of navigation.

This spill regime in table 13 of the 2010 Fish Passage Plan allows for the full range of spill down to zero at Granite if flows are low. This issue is still unresolved at FPOM, and Idaho doesn't accept the operation shown in table 13. FPAC is in the process of drafting a change form to the FPP to address the situation, Kiefer said. The draft will go to the COE and FPOM for review. Then FPOM will schedule a conference call to discuss it prior to their next regular meeting April 15. FPOM's primary focus is on how to use the surface weir most effectively under low flow conditions.

Ice Harbor will be on minimum generation, spilling just at or under its 45% daytime spill level. It's too early to tell whether the required operation will be impeded by low flows. In the lower Columbia, the FOP gives McNary a general requirement of 50 kcfs flows through the turbine and a 50% spill operation. The threshold for being able to fully implement the required operation is around 105 kcfs. This, too, will be a close call. Bonneville faces a similar touch-and-go situation, with a low minimum requirement of 30 kcfs through the turbines. The Bonneville operation calls for 100 kcfs spill, but it's looking like flows will be only 72 kcfs, leaving the project spilling as much as it can, subject to inflows.

Norris asked, will Vernita Bar flows be provided through the end of March? Will the salmon managers recommend a particular flow rate until mid-April? One of the COE modeling assumptions is running Vernita Bar flows until April 20, Barton replied. The Vernita Bar agreement requires 60 kcfs to maintain established redds. BPA could operate to provide 60 kcfs at Vernita Bar for the

rest of April unless the salmon managers request a change, Norris said. However, the flow objective of 135 kcfs from April 10 to the end of the month won't be achievable this year without dramatic effects at Grand Coulee. According to a single trace model, the projected Grand Coulee elevation for the end of April is 1,270 feet under the current operation – about 8 feet below the flood control elevation of 1,283 feet.

Wagner suggested shaping as much water as possible into May to boost spring flows for both Columbia and Snake River juvenile migrants. Typically the salmon managers recommend increased flows in April for mid Columbia steelhead. Prime time for mid Columbia steelhead is typically at the end of April and in May.

c. Lower Snake Drafting to MOP. The COE is targeting minimum operating pool elevations starting April 3 on the four lower Snake River projects. In August 2009, the COE was able to maintain a MOP to MOP+1 operation at Little Goose. The newly installed gage is being recalibrated to verify river depth over the sill with a high degree of accuracy.

Because the April 3 start date for MOP operations is specified in the FOP, a delay would require unanimous TMT agreement. Lower Monumental and Ice Harbor dams will have lock outages until March 27, Kanbergs noted. There may be opportunities to coordinate operations and get the most out of available flows by shaping the available water into pulse mode, Barton said. TMT will revisit MOP operations on the Lower Snake during its April 24 conference call.

9. 2010 Initial Spill Priority and Emergency Actions Lists

Scott English showed TMT two COE documents regarding spill priorities, linked to today's agenda. The first document guides RCC in establishing spring spill priorities at the projects. A preliminary version of the 2010 spring spill priority list is posted for TMT's review.

Norris asked TMT members to review the BPA emergency actions list, part of the generation action plan. TMT will discuss both lists on March 31.

10. Transport Update

On March 12, Wagner said, NOAA, USFWS and Oregon made presentations to ISAB regarding their transport findings. The presentations are available online, linked to the ISAB March 12 agenda (under the ISAB tab on the Northwest Power and Conservation Council's website). Litchfield spotlighted a NOAA analysis, based on SARs from 2007, that showed no spill in May cut steelhead returns in half, from 92,000 to 46,000 adults. Poor ocean conditions would exacerbate the negative effects of no spill.

On April 9, ISAB will issue a report based on the agency information, Wagner said. According to Wagner, default mode is to spill in May. If the ISAB

recommends maximum transport in May this year, NOAA will present the recommendation to RIOG and TMT for review. TMT will revisit this after ISAB releases its report April 9.

11. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,276.3 feet, meeting the stepped-down chum operation until March 22, when it will transition to Vernita Bar protection flows. The elevation has been around 1276.3 feet for the last 4-5 days.

Hungry Horse is at elevation 3,521.4 feet, well below its end April flood control elevation of 3,555 feet. Discharges are around 2.4 kcfs. The March final forecast is for a March-July inflow volume of 1,465 kaf. Libby is at 2404.48 feet, with inflows of 2.5 kcfs and a minimum discharge of 4 kcfs, still below the flood control rule curve. Albeni Falls is at elevation 2,051.69 feet, discharging 10.2 kcfs. Dworshak is at 1,520.34 feet and filling slowly, with 2 kcfs inflows and 1.2 kcfs outflows.

Lower Granite inflows are 23.7 kcfs, and McNary inflows are 92.6 kcfs. Bonneville is discharging 117.3 kcfs.

b. Fish. Juveniles: Passage counts are around 20 fish for the past week at the White Bird and Imnaha traps, Wagner said. These are wild and hatchery fish from tributaries. Approximately 500 subyearling Chinook and 30 coho are passing Bonneville per day. Yearling Klickitat, probably hatchery releases, are passing at the rate of about 1 per day.

Adults: Spring Chinook passage apparently dropped by 20% when attraction flows were shut off at Bonneville. Steelhead passage numbers of 140 per day are higher than usual. About 100 steelhead per day, both A-run and B-run fish, are passing Lower Granite Dam.

c. Power System. Wind generation capacity is up to 2,780 aMW, 6 times the generation capacity of Bonneville Dam, Norris said. However, only 2-300 aMW of that capacity is BPA-owned. Most wind generation is scheduled for service outside BPA's balancing authority area.

d. Water Quality. On March 16, TDG levels in the Dworshak tailrace spiked over 110%, and the COE immediately increased generation to 1,200-1,600 cfs for a few hours to curtail gas production, Steve Hall (Walla Walla) said. Discharges from Dworshak might fluctuate until the exact nature of the problem is clear. Until the TDG spike, Dworshak was releasing as little water as possible, which causes the turbine valves to suck in air in so the turbines won't be exposed to negative pressure. There's a strong possibility that increasing discharges will bring the TDG levels down.

Scott English and Laura Hamilton (COE) gave TMT a virtual tour of the RCC's redesigned web page, linked to the TMT page. The new water quality site houses all the tools the RCC uses to manage water quality in the Northwest. English and Hamilton pointed out several links of potential interest to TMT.

Spill Review Information: The fourth link under this heading shows in bold, at any given time, the most stringent TDG values to which the COE operates the projects. Other links show the individual state water quality standards for Washington and Oregon, which differ significantly due to recent changes. The COE always operates the projects to the most restrictive standard.

In 2006, Washington changed its definition of a TDG exceedance to a consecutive 12-hour reading instead of a rolling average. This extends the TDG reporting period to 35 hours and can lead to double-reporting of the same incident on consecutive dates. In 2009, Oregon removed the 115% forebay requirement from its water quality standard, so the Oregon web report lists only tailwater gage readings.

Other Documents Related to TDG Management: The RCC site includes links to information on TDG policy documents, meetings, plans and reports, as well as how the COE plans to manage gas levels at each project. An annual TDG and temperature report summarizes RCC spill programs and gives field information relative to requirements for each project. A spill change guidance document explains how the COE plans to manage spill each year. There's also an overview of the TDG monitoring system.

Data Query: Near the bottom of the RCC page is a data query link, a powerful tool that allows users to request information they can't find elsewhere.

12. Next Meeting

The next TMT meeting will be a possible conference call March 24, followed by a meeting in person March 31. This summary prepared by technical writer Pat Vivian.

Name	Affiliation
John Roache	BOR
Doug Baus	COE
Cindy LeFleur	Washington
Kyle Dittmer	CRITFC
Dave Wills	USFWS
Russ Kiefer	Idaho
Jim Litchfield	Montana
Steve Barton	COE
Paul Wagner	NOAA
Rick Kruger	Oregon
Laura Hamilton	COE
Scott English	COE

Mark Fisher
Chris XX
Tony Norris
Joel Fenolio
Scott Bettin

EDF Trading
EDF Trading
BPA
COE
BPA

Phone:

Pete Lyman
Brian Marotz
Sherry XX
Glen Trager
John Hart
Barry Espenson
Greg Lawson
Margaret Filardo
Russell Langshaw
Rob Allerman
Tom Le
Karl Kanbergs
XX
Brenda Anderson

PGE
Montana
Puget Sound
Shell Energy
EWEB
CBB
Pt. Carver
Fish Passage Center
Grant PUD
Deutschbank
Puget Sound Energy
COE
Snohomish PUD
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
WDFW : Cindy LeFleur / Charles Morrill **MT** : Jim Litchfield / Brian Marotz
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Wednesday March 24, 2010 09:00 - 10:00

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Chum Emergence Update - Paul Wagner, NOAA Fisheries
3. Bonneville Powerhouse 2 Corner Collector (B2CC) Update - Steve Barton, COE-RCC
4. Lower Snake River Drafting to MOP - Steve Barton, COE-RCC
5. Other
 - a. Set agenda and date for next meeting - **March 31, 2010**
 - b. [\[Calendar 2010\]](#)

*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

March 24, 2010 Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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.

Chum Emergence Update

Paul Wagner, NOAA, reported to TMT that there was a field visit Friday 3/19 and one scheduled for 3/24 to confirm/observe connectivity between Hamilton Creek and the Columbia River. Wagner noted that with the tailwater elevation at 10.5, the protected Ives Island area is dry and much has been dewatered. There is no flow over the control point area and it has been disconnected with the river. However, Hamilton Creek is well connected to the Columbia River and there is good egress from the creek to the Lower Columbia. There were no questions/comments from TMT members.

Bonneville Powerhouse 2 Corner Collector (B2CC) Update

Steve Barton, COE, recalled the operation discussed at the 3/17 TMT meeting, when the B2CC was open around the clock. Barton reported that the operation held through the weekend until 1300 hours on Monday afternoon 3/22, when the Warrendale gauge was reporting TDG at 110% for about 8-9 hours (peak level was 111.1%). The following morning, Tuesday 3/23, TDG levels were 1% higher than where they were the previous morning so the decision was made to close the corner collector due to the continued exceedances. Barton said that TDG has come down to 104.2% saturation (below state standards) and added that the latest instructions given to the project staff were to perform a daily on/off operation between 0600 and 1300 hrs. However, due to excessive winds, it is not possible to open the corner collector today. A crane and rigging crew is required to open and close the corner collector and to assure safety of the crew, and it cannot be opened or closed when the wind exceeds 15mph. As the forecast is calling for continued high wind, the corner collector will remain closed until the winds subside.

The COE asked TMT members for comment/suggestions; the group discussed the probability of gas levels rising again as well as options surrounding manipulating attraction waters. Paul Wagner, NOAA, noted that while the corner collector operations are beneficial for kelt passage, adult attraction flows in the sluiceway are desirable if the corner collector is closed. Cindy LeFleur, WDFW, asked if there was a problem with turning the attraction flows on and off; Wagner clarified that no, as adults tend to approach the project in the morning hours there is not much value added by turning on the corner collector in the afternoon. Tom Lorz, CRITFC, added that running attraction flows at first light would be optimal and that the ideal operation would be to run the corner collector at night and adult attraction flows during the day, as kelt pass all day.

Wagner stated that from the Salmon Manager's perspective, the most desirable operation would be to keep the corner collector open around the clock; however, if wind continues to be an issue, then the preference would be to run the adult attraction flows in the morning.

Steve Barton clarified that if conditions allow, the COE will re-open the corner collector and some amount of wind/precipitation will likely help TDG levels stay down and support continuous B2CC operations. Barton noted that the forecast calls for moderate winds but a break in the weather is expected; he suggested that until weather permits the B2CC to be opened, adult attraction flows could run through spillbay gates 1 and 18.

Action/Next Steps: The COE will move forward with the above short-term plan and TDG levels will be closely monitored. Tom Lorz, CRITFC, said that he would make an effort to convene an FPOM call on this issue. The COE will share any operational changes or updates with TMT members via email.

Lower Snake River Drafting to MOP

Steve Barton, COE, reviewed the planned operation to draft the Snake River to MOP by April 3rd, per the BiOp and the FOP. Paul Wagner, NOAA, shared that the MOP operation was discussed at the 3/23 FPAC meeting; he said the Salmon Managers had considered whether it would be beneficial to defer drafting until a later date in April, when more juvenile migrants are likely to be present in the river. At the moment, there are not very many fish present, but Salmon Managers suggested that is due to the low flow conditions and if a bump in flows were to pass through, fish presence would also rise.

TMT members discussed the timing going into the first few days of April and what would be required to coordinate a change to the April 3 date specified in the Fish Operations Plan. The Salmon Managers asked if a recommendation could be shared on 3/30 at noon, after the FPAC meeting (when more FPAC members will be present to coordinate the recommendation.) Steve Barton, COE, stated that felt that the March 31st date was cutting it close, and noted that any recommended changes to the operation's date need to be vetted with the COE's legal team, as they relate to both the FOP and the BiOp.

Russ Kiefer, ID, shared that, given the low water year, delaying the draft to MOP could be beneficial to fish and added that a trigger(s) should be determined that would work well for fish and for the Action Agency process associated with drafting to MOP. Cindy LeFleur, WDFW, asked whether full TMT consensus would be necessary to effect a change to the draft date; again, Barton said he would need to consult with the COE's legal team. Barton asked the Salmon Managers if, by correlation to a recommendation to change to the MOP draft date, they would also recommend a delay the initiation of spill (scheduled for April 10 and also a FOP/BiOP specified operation. Tom Lorz, CRITFC, noted that given the current litigation, he suspects that TMT is not able to make the final call and that an SOR may be necessary. Tony Norris, BPA, noted that the April 3rd MOP date has been set for some time and that modifying that date is an issue as an operational change would take 2-3 days to for BPA to coordinate. Given the time constraint, he

suggested the default be to operate with the understanding that drafting to MOP will occur on April 3rd.

The COE suggested an alternative to consider would be to fill to slightly above MOP and provide a “pulse” of flow when fish are present; this alternative would still meet the currently planned draft to MOP date and therefore wouldn’t call the operation into legal question. Jim Litchfield, MT, agreed that push water through when fish are present, but added concern for any up/down patterned operation. Barton stated that any recommendation needs to be made as soon as possible and reiterated that the intention is to do what is best for fish. Rick Kruger, OR, noted that Oregon will not support delaying spill but are open to considering a delay to the draft to MOP date. Russ Kiefer, ID, noted some concern for making conditions any worse than they already are, but said he could consider the pulsing idea, as it might help keep fish moving during this low water year.

All agreed that the recommendation to change the draft to MOP date, if there is to be one, need to be made quickly; Barton reminded TMT that consulting with the COE’s legal team will likely dictate whether a change to the date is possible, even with an SOR and consensus amongst TMT members. Wagner reiterated that it may not be possible to gather input on a recommendation from all FPAC members until noon on Tuesday 3/30, but that every effort would be made to convene the group as soon as possible.

Action/Next Steps: Barton will discuss the issue with the COE’s legal department to confirm what kind of consensus is required to effect a change to the April 3rd date. Barton will communicate their response to Wagner as soon as it is known. Coordination amongst FPAC members will be ongoing between now and early next week. In the meantime, drafting to MOP on April 3rd will be the default operation. In the event that a TMT call needs to be convened before the 3/31 scheduled meeting, notification will be shared via email.

The next TMT meeting will be: face to face on 3/31 at 9:00am and will be **held at NOAA in the St. Helens room, 10th floor.**

Agenda items will include:

- Notes Review
- Updated Weather and Flood Control Forecasts
- Chum Surveys re Connectivity
- 2010 Operations
- Spill Priority List/ Emergency Actions
- TDG Instances/ Definition Changes
- Priest Rapids Update
- Operations Review

**Columbia River Regional Forum
Technical Management Team Conference Call
March 24, 2010**

1. Introduction

Today's TMT call was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting) with representatives of the COE, BPA, Montana, Washington, BOR, CRITFC, NOAA, Oregon, Idaho and others present. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Chum Emergence Update

Paul Wagner (NOAA) reported that on March 19, with a tailwater elevation of 10.5 feet below Bonneville Dam, field visits found the spawning area that had been protected by the minimum tailwater elevation for chum emergence is now completely dry and disconnected from the Columbia River. Hamilton Creek, however, has remained connected to the Columbia River, with adequate flows for passage despite the low elevation. That will be verified today via another field visit.

3. Bonneville 2nd Powerhouse Corner Collector Operation for Kelts

The COE has kept the B2CC open 24/7, operating powerhouse 2 as the priority, with the sluiceway and adult attraction flows turned off in bays 1 and 18 per TMT's discussion at the March 17 meeting. That operation continued through the weekend, Barton reported.

On the afternoon of March 22, TDG levels at the Warrandale gage hit 111.1%, exceeding the state standard of 110% for 8-9 hours. Gas levels the next morning rose another 1% so the COE closed the B2CC at 1 pm, March 23.

The Warrandale gage read 112.8% TDG saturation at the time the B2CC was closed. Gas levels since then have receded, so the plan was to reopen the B2CC again at 7 am today. However, winds above 15 mph in the Columbia Gorge are making it unsafe for project personnel to operate the crane needed to reopen the corner collector. The COE will continue to evaluate the situation, which raises questions about the viability of an on-off B2CC operation for kelts to conserve water, given that the gorge is often windy. It doesn't look like the COE will be able to open the B2CC today, but project staff will touch base with COE staff at 11 am and decide whether to make another attempt.

TMT's focus turned to operation of the sluiceway and adult attraction flows while the B2CC stays closed. Barton asked the salmon managers for their views of the attraction flow and sluiceway operation. Comments also touched on the B2CC operation itself. There may be an opportunity to reopen the B2CC and see

how it operates under windy conditions, he said. Perhaps the B2CC will be able to operate continuously without violating state water quality standards if the wind persists. USFWS and Oregon were not represented in this discussion today.

- **NOAA** – In the absence of the B2CC operation for kelts, it's desirable to operate the sluiceway and provide adult attraction flows in the morning, when they are most valuable to fish. The best plan once the B2CC is open is to keep it open as long as gas doesn't become an issue.
- **CRITFC** – Suggested operating the B2CC at night and shutting it down in the morning, when attraction flows are turned on for adults. Also favored keeping the B2CC open and monitoring TDG levels to see whether windy conditions over the next few days sufficiently strip the gas out of the river.
- **Washington** – Expressed interest in the idea of turning attraction flows on and off as needed.
- **BPA** – If windy conditions are predicted by afternoon, don't open the B2CC that day, just provide attraction flows.
- **Idaho** – No comments.

There was general agreement to reopen the B2CC as soon as conditions allow, with continued monitoring of gas levels. Windy weather is expected tomorrow and throughout the weekend which would help keep TDG levels down. TMT will be informed of the status of the B2CC operation via email until the next TMT meeting March 31.

4. Dropping to MOP on the Lower Snake River

The COE's default operating plan for the lower Snake projects, absent a recommendation otherwise, is to draft Lower Granite Dam to MOP by April 3 and maintain a tailwater elevation of 633-634 feet at Little Goose Dam, not a MOP+1 or MOP+2 operation, Barton said. TMT discussed this operation at its last meeting March 17.

FPAC discussed the MOP issue yesterday and favors deferring the draft until later in April when there will be more juvenile migrants in the river, Wagner said. Drafting a project for 24 hours creates a significant bump in flows that could amount to a simulated mini-freshet. For example, drafting flows of 25 kcfs at Lower Granite for 24 hours would increase flow volume by 50% and provide a 12 kcfs bump. FPAC was uncertain when the best time in April would be for such a bump, and is aware that deviating from the April 3 start date specified in the FOP could be a procedural challenge. FPAC finally deferred its decision to March 31 in hopes of having a more fully developed strategy by then.

In the meantime, Barton said he would check with the COE office of legal counsel on what the requirements would be for coordinating a deviation from the FOP and the BiOp by delaying MOP and spill this year. He asked TMT to consider delaying the start of spill along with the start of MOP, and TMT members expressed their views. USFWS was not represented in this exchange.

- **Idaho** – Delaying MOP this year would benefit fish by giving the first wave of migrants a little push down the Snake in a dry year. Recognizes the need for a more definitive operation in terms of dates the water should be released.
- **Washington** – Wants to further investigate the option of delaying MOP past the beginning of spill.
- **COE** – Other operations should be timed for when fish will get the most benefit. If it's advantageous to delay MOP, it may be advantageous to delay spill as well. Favors pulses as a way to move fish down the river while conserving water. Pulses wouldn't necessarily delay the draft to MOP or call the spill operation into question.
- **CRITFC** – Whether or not it makes sense to delay spill along with MOP is an AFEP issue. Given the BiOp litigation, it's doubtful that TMT could make a decision on this unless all parties agree, and not all parties are present today.
- **BPA** – Agrees with CRITFC that this is not just TMT's decision. The same logic applies to both MOP and spill operations, which are date-set in the FOP that was submitted to the judge. Given the time constraints on coordinating a change of the FOP with the court, one possibility is to fill above MOP now and draft the excess out later when more fish are present. Drafting to MOP and spilling, then drafting again, could buy some time to deal with the procedural challenge of deviating from the FOP. If MOP is delayed past April 10, the water will be spilled in the lower Columbia and not in the Snake.
- **Montana** – It makes sense in a bad water year to store above MOP and use the water to help get fish out to the ocean. However, Montana is strongly opposed to an operation that would cause elevations to rise and fall. Believes these fluctuations would also represent a deviation from the FOP and should be reported to the court even if FOP-specified dates are met. TMT involvement alone isn't sufficient to justify the deviation.
- **Idaho** – Has considered delaying the start of spill, but is reluctant to make conditions worse for early migrants in a bad year. Willing to consider, however, whether the overall benefits to fish would outweigh the adverse impacts. Also willing to consider pulses to keep fish moving.
- **NOAA** – Advocated waiting to begin the MOP operation until FPAC can discuss the issue again on March 30.
- **Oregon** – Willing to delay the start of MOP, but is strongly opposed to delaying the start of spill.

The COE and BPA agreed that a decisive plan is needed by March 29 at the latest in order to set up water movement on the river accordingly. After March 29 it will be more difficult, but not impossible, to alter the plan. Barton will clarify the procedural requirements involved in a FOP deviation. Wagner will try to set up an FPAC conference call on March 26, with a goal of drafting an SOR that proposes a specific operation for the lower Snake projects. BPA and NOAA

agreed that if water is to be moved before March 30, it would be preferable to draft from Ice Harbor first and move up the river.

5. Next Meeting

The next TMT meeting will be at NOAA's Portland office on March 31. This summary prepared by technical writer Pat Vivian.

Name	Affiliation
Jim Litchfield	Montana
Tony Norris	BPA
Alex XX	Grant PUD
Doug Baus	COE
Steve Hall	COE
Steve Barton	COE
Cindy Lefleur	Washington
Barry Espenson	CBB
Glen Trager	Shell Energy
Richelle Beck	DRA
Tom Le	Puget Sound Energy
John Hart	EWEB
Greg Lawson	Pt. Carver
Rob Allerman	Deutschbank
John Roache	BOR
Laura Hamilton	COE
Tom Lorz	CRITFC
Paul Wagner	NOAA
Rick Kruger	Oregon
Scott Bettin	BPA
Tim Heizenrader	Centaurus
Shane Scott	PPC
Rob Dies	Iberdrola Renewables
Russ Kiefer	Idaho

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday March 31, 2010 09:00 - 12:00

NOAA Fisheries
1201 N.E. Lloyd Blvd., Suite 1100
Portland, Oregon 97232-1274
Map Quest [\[Directions\]](#)

Mt. St. Helens Room, 10th Floor Conference Room

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

> 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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for March 17 & 24, 2010 [\[Meeting Minutes\]](#)
3. Updated Weather and Flood Control Forecasts - Karl Kanbergs, COE-RCC
 - a. [Westwide SNOTEL](#)
 - b. [NWRFC Current Snow Conditions](#)
4. Hanford Reach Update - Russell Langshaw, Grant County PUD
5. Dworshak Release - Dave Wills, USFWS
6. 2010 Operations - Doug Baus, COE-RCC
 - a. Bonneville Powerhouse 2 Corner Collector Operations
 - b. Low Flow & Spill Operations
7. 2010 TDG Reporting - Scott English, COE-RCC
 - a. [Incident Category Table](#)
8. Emergency Actions List - BPA - NOAA Fisheries
9. Operations Review
 - a. Reservoirs
 - b. Fish

- c. Power System
 - d. Water Quality
10. Other
- a. Set agenda and date for next meeting - **April 7, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

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

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

TDG Instance Types

TMT Presentation

March 31, 2010

Scott English
Water Quality Program Manager
NWD Reservoir Control Center

Introduction

- Water Quality Standards
- Exemptions (Waiver & Rule Adjustment)
- TDG Instances
- Reporting

Water Quality Standards

Total Dissolved Gas (TDG) & Temperature are the primary water quality parameters monitored on the mainstem Columbia & Snake Rivers in Idaho, Montana, Washington and Oregon

Water Quality Standards

- The state water quality standards for TDG are defined in terms of Total Maximum Daily Loadings (TMDL)
- USACE policy is to comply with state water quality standards to the extent practicable regarding nationwide operation of water resources projects

Water Quality Standards

During the fish migration *spill season* (April 1 through August 31) USACE receives a waiver to the Oregon State TDG standard & a rule adjustment to the Washington State TDG standard

Water Quality Standards

- In 2007 both Oregon and Washington states changed their water quality standards which effect the TDG instance tracking information during spill season
- However, these changes to the state water quality standards were not implemented in 2009 spill season due to the 2008 BiOp litigation
- This condition holds true again in 2010 spill season due to *roll-over* operations

Water Quality Standards

- There are situations during the spill season when the percent TDG levels exceed these state water quality exemptions we are operating to
- The NWD Water Quality Team track these situations and report them to the states as instances
- The definitions of the causes (types) of instances has been evolving since 2003

TDG Instance Reporting

- From 2002 – 2008 fourteen instance types were used
- In 2009 the definitions were condensed from fourteen to three instance types which include all of the previous fourteen
- This approach will continue for the 2010 spill season reporting

TDG Instance Reporting

Type 1 Condition	<p>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:</p>
	<ul style="list-style-type: none"> • High runoff flows and flood control efforts. • BPA load requirements are lower than actual powerhouse capacity. • Involuntary spill at Mid Columbia or lower Snake river dams resulting in high TDG levels entering the lower Columbia River.
Type 1a Condition	<p>Planned and unplanned outages of hydro power equipment including generation unit, intertie line, or powerhouse outages.</p>
Type 2 Exceedance	<p>TDG exceedances due to the operation or mechanical failure of non-generating equipment. This exceedance type includes:</p>
	<ul style="list-style-type: none"> • 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	<p>Malfunctioning FMS gauge, resulting in fewer TDG or temperature measurements when setting TDG spill caps.</p>
Type 3 Exceedance	<p>TDG exceedances due to uncertainties when using best professional judgment, SYSTDG model and forecasts. This exceedance type includes:</p>
	<ul style="list-style-type: none"> • 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.

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 or lower 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

Reporting Mechanism

- The NWD Water Quality Team will track TDG instances through out the 2010 spill season.
- Appendix F of the Annual Dissolved Gas & Temperature Monitoring Report provides the reporting details to the states and stakeholders.



Questions?



Thank you!

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

March 31, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 March 17rd and 24th, 2010

Paul Wagner, NOAA, has some changes to the official meeting minutes that he will submit at the next face to face meeting. No other changes to the facilitator's summary or official meeting minutes were made and both sets will be considered final after the aforementioned corrections are made.

Updated Weather and Flood Control Forecasts

Karl Kanbergs, COE, directed TMT to two pages of data, both posted as links to the agenda. He reported that the snow/water equivalent conditions had somewhat improved. The Cascades were 50-69% of normal and snow pillows are not dropping at this point but are almost catching up to average levels. While the forecast calls for above average precipitation for the first few weeks of April, a major impact on the Columbia is not expected as NW Oregon is still below average. He also reviewed NWRFC Current Snow Conditions, reporting that current snow conditions are 75-90% of normal for Canada. The early bird forecast was due to be released on 4/1.

Hanford Reach Update

Russell Langshaw, Grant County PUD, reported that operations have been uneventful since his last update. He reported that 3/19 had a notable daily delta of 28.7 kcfs, but that overall conditions have stayed well within the 30 kcfs constraint. Langshaw said that conditions are at 740 temperature units from the end of spawning, so another 250 temperature units are expected before the emergence period.

Action/Next Steps: Langshaw will present updated information at the 4/14 TMT meeting.

Dworshak Release

Dave Wills, USFWS, reported that given the amount of recent precipitation at the project and that the mainstem Clearwater River is expected to peak tonight (3/31) at 12kcfs, the Hatchery would like to release 1.1 million smolts tonight to take advantage of this increased flow and turbidity. The Water Management Plan calls for bringing flows up by 5 k to provide increased flows over a 6 hour period. Paul Wagner, speaking on behalf of the Salmon Managers, said that this item was discussed at FPAC and members were in support of the operation.

Action/Next Steps: Doug Baus, COE, said that the operation will move forward as requested today, Wednesday 3/31 between the hours of 6:00 and midnight.

2010 Operations

Doug Baus, COE, reported on current operations at Bonneville:

- **Bonneville Powerhouse 2 Corner Collector Operations:** Baus shared that the operation has been challenging given the need to balance kelt passage with TDG levels at Warrendale. He noted that the B2CC is currently open and that the COE planned to grant the NOAA request to open the ice and trash sluiceway later in the day Powerhouse 1. Scott Bettin, BPA, reminded TMT that the corner collector is scheduled to be off for maintenance during a ten hour window beginning at 0700 on April 10th. Baus noted that next year the COE is hoping to automate the corner collector which would simplify the on/off operation. He further noted that the TDG waiver goes into effect tomorrow 4/1, so there will be no need to stay under the required 110% and the corner collector can be open around the clock. TMT members had no question regarding the operation.
- **Low Flow & Spill Operations:** Baus noted that the low flows observed this year have been a challenge to operations. Lower Columbia River spill begins on 4/10 and April flows at Bonneville are estimated to be in the range of 108.1 kcfs. Karl Kanbergs, COE, noted that Ice Harbor flows will likely be at 30-45 kcfs for April. Snake River spill begins 4/3 at one minute past midnight. Spill levels are expected to be short this season. Spill is normally at 45 but the COE cannot provide a full volume of spill due to the low water year. Laura Hamilton, COE, added that most projects will be on minimum generation during spill season.

Russ Kiefer, ID, shared that FPOM came to an agreement on triggers for Little Goose operations during spill season regarding the surface weir. TMT members noted that this was a well coordinated effort and the surface weir will be in operation for most of the season. Rick Kruger, OR, shared that there is a regional coordination call planned for Thursday 4/1 at 0800 to discuss Bonneville spill operations.

Action/Next Steps: Doug Baus, COE, will post the Little Goose change form order to the draft 2011 Fish Passage Plan (as it will be incorporated into next year's plan) to the website as soon as possible. TMT members can also email Doug directly for a copy. TMT will discuss the results of the Bonneville Spill regional call at the 4/7 meeting.

2010 TDG reporting

Scott English, COE, referred TMT to a power point presentation posted as a link to the agenda that provided detail on TDG Instance Types. He shared info that helps define how the COE classifies different types of "conditions" and "instances". The presentation covered the following topics: Water Quality Standards, TDG definitions, COE policies surrounding TDG issues, and the OR/WA state waiver processes/standards. Laura Hamilton, COE, clarified that the COE is currently following the 2006 BiOp criteria, due to the court-ordered rollovers. (If the 2008 BiOp is approved, then the COE will commence implementation of WA's 2006 change and OR's 2009 change to water quality

criteria.) English also reviewed the COE's TDG instance reporting process and detailed the various conditions and exceedances types. TMT members thanked the COE for their presentation.

Emergency Actions List

Paul Wagner, NOAA, reported that the Salmon Managers reviewed the current Emergency Actions List and had no recommendations for changes at this time. He noted that Priest Rapids was brought to the top of the list for the Initial Spill Priority List. The Emergency Actions List is posted as an appendix to the Water Management Plan posted on the TMT website.

Operations Review

Reservoirs: Grand Coulee was at elevation 1278.15' and meeting Vernita Bar protection. Hungry Horse was at 3520.55', with .8 kcfs outflows and filling very slightly for the first time this season. Libby was at elevation 2403.5', with 3.5 kcfs inflows and 4.0 kcfs outflows and drafting slightly. Albeni Falls was at 2051.8' and passing outflows of 13.5 kcfs. Dworshak was at elevation 1524.7' with inflows of 9.5 kcfs and outflows of 1.2 kcfs; the Dworshak pool filled almost 1' on 3/30, but will still have a challenge in filling this year. Updates refill probability estimates will be discussed at the next TMT meeting. Lower Granite flows were at 35.4 kcfs, McNary flows were at 96 kcfs and Bonneville flows (due mostly to Priest Rapids flows) were at 129 kcfs.

Fish Paul Wagner, NOAA, directed TMT to the Fish Passage Center's smolt data/ two week passage index. He reported for juveniles: yearling Chinook were at 533, with 2500 total on the Snake River. Lower Granite had 0-10 fish but numbers are expected to pick up soon. Bonneville had 300. Subyearlings were in the 500-600 per day range, totals at 1800. Steelhead were beginning to show, with Lower Granite passage numbers at 10. Adults: seeing 25-35 Spring Chinook per day at Bonneville with a total of 300 so far. Steelhead were in the range of 100-130 per day, totaling 3700 for the season so far. Lower Granite had 350, totaling 5000. Wagner noted that the season is still early and higher numbers are expected in April. Cindy LeFleur, WA, added that lower Columbia River gil net fishing opened yesterday, and catch estimates should be available in the coming weeks.

Power Tony Norris, BPA, had nothing to report.

Water Quality: Scott English, COE, had nothing to report. He did mention that all gauges and monitoring stations are running well except for Chief Joseph, which was expected to be running properly by 4/1.

The next TMT meeting will be: a face to face on **4/7 at 9:00 am at COE.**

Agenda items will include:

- Notes Review
- Updated Weather and Flood Control Forecasts
- Hanford Reach Update
- Dworshak Release Update
- 2010 Operations Update

- Spill Update
- Operations Review

Future TMT meetings:

4/14 face to face, time currently set for 9 am, but confirmation to come via email.

Agenda items will include

- Transport Update
- Updated Weather and Flood Control Forecasts
- Hanford Reach Update
- Dworshak Release Update
- 2010 Operations Update
- Spill Update

4/21 - conference call

4/28 - face to face- COE

5/5 - face to face- COE

5/12 - conference call

5/19 - face to face- COE

5/26 - conference call

**Columbia River Regional Forum
Technical Management Team Meeting
March 31, 2010**

1. Introduction

Today's TMT meeting was chaired by Karl Kanbergs (COE) and Doug Baus (COE) and facilitated by Erin Halton (DS Consulting) with representatives from COE, BPA, Oregon, Montana, BOR, USFWS, NOAA, CRITFC, Washington, Idaho and others present. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for March 17 and 24

Paul Wagner (NOAA) said he had a few comments he would bring to the next TMT meeting April 7, when the March 17 and 24 minutes will be finalized.

3. Updated Weather and Flood Control Forecasts

Karl Kanbergs (COE) showed TMT two graphs linked to today's agenda that forecast the region's water supply. The first graphic shows current water and snow equivalents in the U.S. portion of the Columbia basin. Conditions have improved slightly since the last report to TMT, particularly in terms of snow accumulation in the Cascade range. However, much of the region still is predicted to have only 50-69% of average water supply. Climate predictions show above average precipitation during the first two weeks of April – but not enough to stage a dramatic turnaround. Water forecasts remain low throughout the Northwest despite recent rains.

The second link shows forecasts for both the U.S. and Canadian portions of the basin. Canada still has 75-90% of average snowpack, with conditions in the U.S. basin lagging behind that. The early bird forecast will come out tomorrow, but a major turnaround is not anticipated.

The ESP forecasts have started to level off, which indicates no further deterioration in the water supply. The ESP forecast released on March 30 was 1 million acre feet below the midmonth forecast, Tony Norris (BPA) noted.

NOAA recently updated its 30-90 day outlook, which is still grim, Kyle Dittmer (CRITFC) said. An updated ENSO forecast of conditions in the Pacific Ocean will be available when TMT meets again April 7.

4. Hanford Reach Update

Since Russell Langshaw (Grant PUD) last reported to TMT, there has been only one day (March 19) with a notable daily delta of 28.7 kcfs. The

constraint that day was 30 kcfs. Daily deltas have ranged from 0.7 to 28.7 kcfs per day, keeping the operation easily under its 20 kcfs or 30 kcfs daily constraints. Flows remain low everywhere, Langshaw said. The accumulation of temperature units at Vernita Bar is about 200 TU's before the end of emergence and 740 TU's before the end of spawning.

5. Dworshak Hatchery Release

Due to recent rains the mainstem Clearwater is rising, with flows predicted to peak tonight, David Wills (USFWS) reported. So Dworshak Hatchery staff would like to release all their fish by midnight tonight to take advantage of the high flows. The hatchery's request is for Dworshak outflows to increase to about 5 kcfs, as in previous years. What's different this year is that the hatchery is preparing to release all 2 million smolts in one night, from 6 pm to 12 pm, in recognition of the impact on scant water supplies. Wills estimated that the request will take about 1-1/4 inches of water from the top foot of the Dworshak reservoir elevation, or around 2 kaf of volume.

Yesterday FPAC discussed this operation, and support was unanimous among all those participating in the conference call, Wagner said. The COE will move forward with this operation as requested.

6. 2010 Operations

a. Bonneville Powerhouse 2 Corner Collector Operations. The COE has been trying to balance water quality standards and kelt passage in its operation of the B2CC, Baus reported. It has been challenging to keep dissolved gas levels under 110%. Recently NOAA requested the COE open the ice and trash sluiceway at powerhouse 1. This morning both the sluiceway and the B2CC were operating.

The B2CC will remain open until 7 am on April 10, when it will close for 10 hours to allow maintenance work on the behavior guidance system and the Bonneville 2nd powerhouse. Next year, it might be possible to automate B2CC operation, removing the challenge of opening and closing it thanks to a \$40 million FY11 item budgeted by SCT. Tomorrow the waiver to the 110% TDG state standard kicks in, making today the last day of B2CC coordination this year.

b. Low Flow and Spill Operations. According to the STP forecast released yesterday, Bonneville inflows will be 108.1 kcfs on April 10 when spill starts on the lower Columbia River, Baus said. This will be a challenging year, with flows poor and spill season fast approaching. When spill starts at 1 minute past midnight on April 3 on the Snake River, Ice Harbor Dam – like Bonneville – is expected to fall short of its flow objective, with probably 30-35 kcfs inflows for most of April instead of the required 45 kcfs.

Rick Kruger (Oregon) said a group of regional stakeholders is meeting tomorrow morning at 8 am to discuss the projected Bonneville spill amount. TMT

will hear a report on this at its next meeting April 7. Tony Norris (BPA) added that BPA will try to flatten as much as possible the flow rate across the day..

Yesterday FPOM reached agreement on how to operate spill over the surface weir at Lower Granite in this low-flow year, Russ Kiefer (Idaho) said. FPOM agreed on triggers for switching from the high to the low crest of the spillway weir, and on when it would shut down if summer flows get low. The changes will be implemented via a change order to the Fish Passage Plan, which has been sent to FPOM members. Doug Baus will post the change order to the COE's 2011 FPP website.

7. Total Dissolved Gas Reporting for 2010

Scott English and Laura Hamilton (COE) gave a presentation on 2010 TDG and temperature reporting of conditions on the mainstem Columbia and Snake rivers. The presentation began with the background of state water quality standards and exemptions during spill season. The TDG waiver process allows the COE to adjust its reporting standards during spill season.

However, due to the BiOp litigation, the Corps is operating to be consistent with operations under the court orders. Under the court-ordered rollover operations, the COE is implementing water quality standards that were in effect in 2006. Since then, Washington redefined a TDG exceedance as a rolling consecutive 12-hour average, and Oregon dropped the requirement to use forebay gages in spill management. Neither of these changes can be implemented while the court-ordered rollover operation continues.

From 2002-8, the RCC used 14 instances in its tracking and reporting of TDG management. In 2009 this was condensed into 3 basic exceedance types.

- Type 1 – These are now called conditions, not exceedances, because they are beyond RCC's control, such as involuntary spill caused by high flows.
- Type 1a – These are caused by planned or unplanned power equipment or generation outages.
- Type 2 – These exceedances are due to communication errors or inability to operate equipment as planned.
- Type 2a – These are caused by malfunction of a fixed TDG monitoring station.
- Type 3 – These exceedances occur despite the use of best professional judgment when conditions don't turn out as predicted.

8. Emergency Actions and Spill Priority Lists

The salmon managers have discussed both the emergency actions and spill priorities lists, Wagner reported. There are no recommended changes to

either list. The emergency actions list is posted to the TMT website as an appendix to the Water Management Plan.

The salmon managers anticipate there will be no involuntary spill this year. The spill priority list is included in the spring/summer update of the WMP, Norris said. Since the spring/summer update was posted, Priest Rapids Dam has been moved to the top of the mid-Columbia section of the initial spill priority list in response to a comment from Paul Wagner, Scott English (COE) said. The spill priority list comes into play when there's overgeneration spill, i.e. no choice but to spill somewhere.

9. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,278.15 feet, meeting Vernita Bar protection flows, John Roache (BOR) reported. Essentially all the headwater projects are well below their rule curves for flood control, Kanbergs said. A phone participant asked, can Grand Coulee reservoir be expected to achieve its April 30 flood control elevation of 1,283.3 feet, given the forecasted inflows? What about meeting the June 30 refill target? The reservoir probably won't reach its April 30 flood control elevation, Roache replied. However, total refill by around June 30 is likely despite the STP projected elevation of 1,264 feet on April 30. Grand Coulee elevations will depend heavily on Priest Rapids operations.

Hungry Horse is at elevation 3,520.55 feet, discharging 0.8 kcfs. Mainstem flows have been rising with about 1-1/2 inches of rain the past few days, so the reservoir is filling slightly for the first time in months. Libby is at 2,403.5 feet, essentially passing inflows of 3.5-4 kcfs to meet the 4 kcfs minimum discharge.

Albeni Falls is at elevation 2,051.8 feet, passing inflows of 13.5 kcfs. Tomorrow it will begin filling.

Dworshak is at 1,524.78 feet, and releases continue at 1.2 kcfs. Inflows rose from 3 kcfs on March 29 to 9.5 kcfs on March 30. As of the March 1 forecast, the COE estimated 50-60% probability of refill. Jeremy Giovando (COE) will look again at the probability of Dworshak refill in response to questions today. The COE will show TMT scenarios of probabilities given specific water volumes. Kanbergs added that a recent single-trace model showed Dworshak missing its refill target by 8 feet, which is similar to 2001 conditions.

Lower Granite releases averaged 35.4 kcfs yesterday, a slight increase. McNary releases yesterday averaged 96 kcfs, and Priest Rapids releases have been holding steady. Bonneville discharges averaged 143.9 kcfs yesterday, a 20 kcfs increase from the previous day thanks to the recent rain.

b. Fish. Juveniles: Passage data from the FPC website show a peak of 2,500 yearling Chinook at the White Bird trap on the Salmon River, probably hatchery releases. Since then, the numbers have fallen dramatically to 533,

Wagner reported. At the Imnaha trap, the yearling Chinook count was 551 fish. Passage counts at Lower Granite were zero, the lowest seen for this time of year, but recently increased to 10 fish per day. Subyearling passage at Bonneville recently increased from 500-600 fish per day to 1,800 fish per day. Steelhead yearling passage is following a similar pattern to that of yearling Chinook, with only a few fish showing up at Lower Granite now, a trend that's soon to change.

Adults: Adult spring Chinook are passing Bonneville at the rate of 25-35 per day, with a cumulative total of 300 fish for the season. Steelhead have been passing Bonneville at the rate of 100-130 per day, with a cumulative total of 3,700 fish for the season. Steelhead passage at Lower Granite is about 350 fish per day, with a cumulative total of 5,000. It's still early in the season, Wagner said, so these low numbers are not surprising. Compared to last year, we shouldn't expect much action until mid-April.

The gillnet fishery opened today, Cindy LeFleur (Washington) reported. She will give an update on the fishery at the next TMT meeting April 7. She estimated a catch of around 2,500-5,000 Chinook, mostly upriver fish that have been delaying their passage over Bonneville Dam.

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

d. Water Quality. All TDG monitoring stations are operating with the exception of Chief Joseph Dam, where the monitoring station was off as of March 26, English reported. The Chief Joseph TDG monitoring station is expected to go back into service today.

12. Next Meeting

The next TMT meeting will be April 7 at the COE division office. Topics covered will include the new water supply forecast, an update on the Bonneville spill discussion, the start of spill April 3 on the lower Snake, and the usual operations review. Subsequent TMT meetings were scheduled on April 14, 21 and 28, with placeholders for meetings or conference calls on May 5, 12 and 19. This summary prepared by technical writer Pat Vivian.

Name	Affiliation
Doug Baus	COE
Tony Norris	BPA
Rick Kruger	Oregon
Karl Kanbergs	COE
Jim Litchfield	Montana
John Roache	BOR
David Wills	USFWS
Paul Wagner	NOAA
Laura Hamilton	COE
Scott English	COE

Scott Bettin
Mark Fisher
Kyle Dittmer

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Cindy LeFleur
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John Hart
Kim Johnson
Jeremy Giovando
Dave Benner
Russ George
Barry Espenson
XX
Glen Trager
Rob Allerman
Greg Lawson
XX
Tom Le
Russell Langshaw
XX
Steve Smith

Washington
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Seattle City Light
Shell Energy
Deutsch Bank
Point Carbon
GP Morgan
Puget Sound Energy
Grant PUD
Portland General

TECHNICAL MANAGEMENT TEAM

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WDFW : Cindy LeFleur / Charles Morrill **MT** : Jim Litchfield / Brian Marotz
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday April 7, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for March 31, 2010 [\[Meeting Minutes\]](#)
3. Updated Weather and Flood Control Forecasts - Doug Baus, COE-RCC
 - a. [Westwide SNOTEL](#)
 - b. [NWRFC Current Snow Conditions](#)
4. Hanford Reach Update - Russell Langshaw, Grant County PUD
5. 2010 Operations - Doug Baus, COE-RCC
 - a. Bonneville Low Flow Spill Plan
 - b. [SOR 2010-01 Low Flow Spill Operations at Bonneville Dam](#)
6. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System

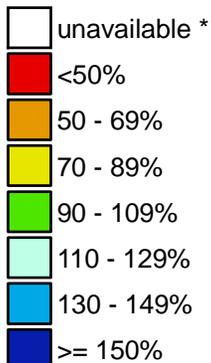
- d. Water Quality
- 7. Other
 - a. Set agenda and date for next meeting - **April 14, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995

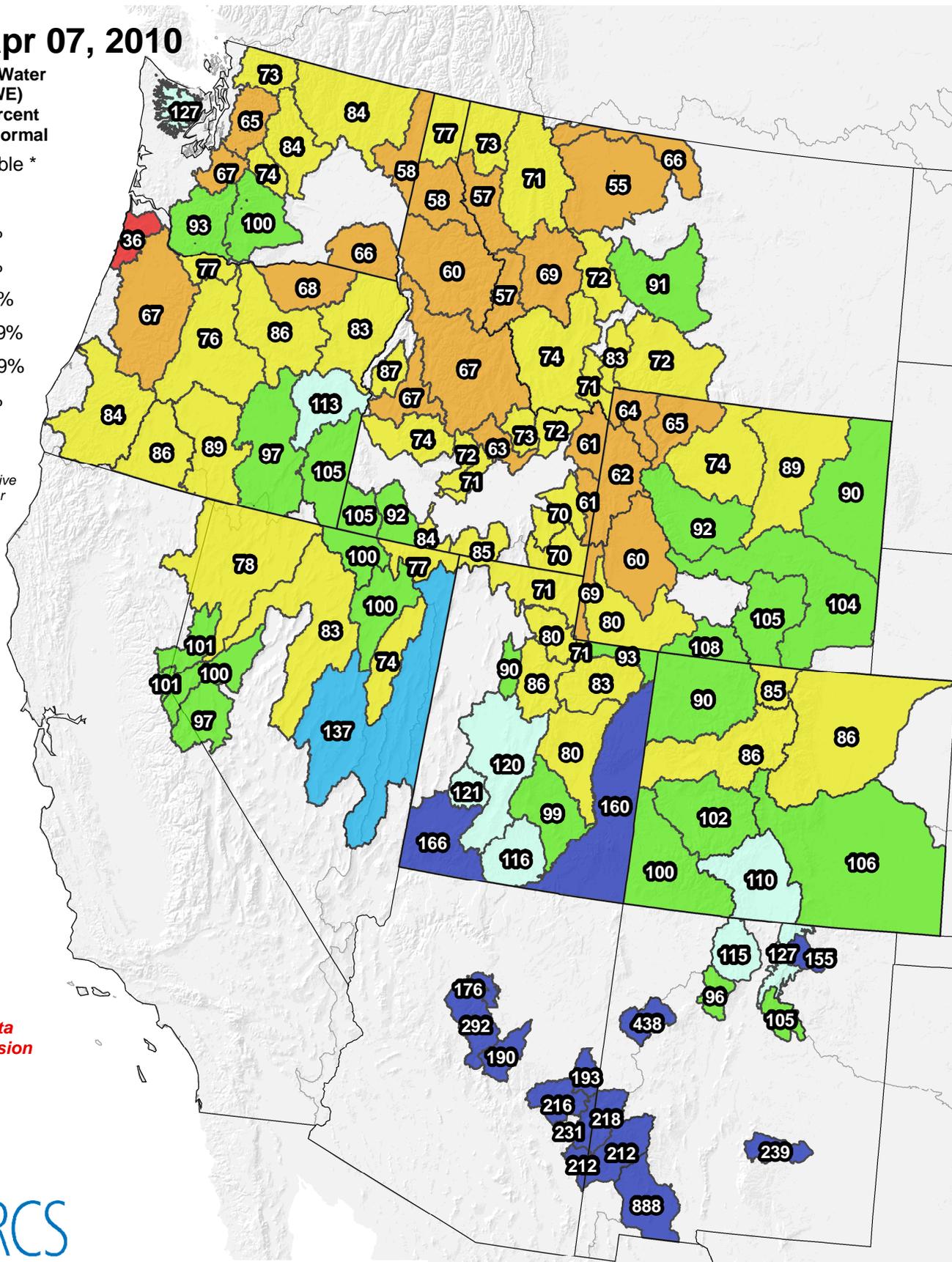
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 07, 2010

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

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 7, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 March 31, 2010

Paul Wagner, NOAA, reported that his edits to the 3-24-10 official meeting minutes had been forwarded to Pat Vivian, official note taker. With those changes made, the March 24th meeting minutes were considered final. Tony Norris, BPA, clarified language in section 6-b. of the 3-31-10 official meeting minutes: the last sentence of the second paragraph should read, "BPA will make the best attempt to flatten the flow rate across the day." Paul Wagner, NOAA, noted that in section 8 of the official meeting minutes, the first sentence of the second paragraph should read "involuntary spill." No other changes to the facilitator's summary or official meeting minutes were made and both sets will be considered final.

Updated Weather and Flood Control Forecasts

Doug Baus, COE, directed TMT to two maps, both posted as links to the agenda. Link a. detailed Westside SNOTEL data which showed snow/water equivalent conditions improved slightly from last week. However, conditions across the basin are still low, at 70-89% of normal for much of the region and some areas as low as 50-69% of normal. The forecast is still calling for low precipitation. Kyle Dittmer, CRITFC, added that there has been no change in the forecast from two weeks ago and will report next week on the updated forecasts. Baus also reviewed link b: NWRFC Current Snow Conditions which showed a slight improvement but conditions are still below average. For April-Aug at The Dalles, the forecast was 68% of normal, 71% of normal at Libby and for April-July at Dworshak, the forecast was 53% of normal. The early bird forecast was released on 4/1 and the final forecast was due out later in the day on 4/7.

Action/Next Steps: The COE will continue to present updates on this item at upcoming TMT meetings.

2010 Operations: Bonneville Low Flow Operations / SOR #2010-01

Doug Baus, COE, read language from the Fish Operations Plan's low flow spill plan and noted that based on the latest STP info, it is clear that Bonneville flows are likely to be below the FOP's specified 75kcf. He reported that the COE did receive an SOR from the Salmon Managers, whose signatories included USFWS, CRITFC, Nez Perce and the Shoshonne-Bannock Tribe. Baus said that the COE planned to proceed with their current strategy of spilling to a minimum of 50 kcf, stopping spill if flows drop below a level such that 50 kcf spill can be provided and resuming spill only when flows return to a

rate that can provide spill of at least 50 kcfs. The COE clarified that spill shut off periods would be minimized to the extent possible, likely for about 4-6 hours.

Dave Wills, USFWS, referred TMT to SOR #2010-01, which had not yet been posted to the TMT website. Wills said that a multi-agency meeting was held last week and that a very technical discussion took place over how best to manage spill at Bonneville from April 10th to approximately April 28th (until such time when flows increase and spill can be provided at/above the level of 75 kcfs.) Wills said that the regional group discussion considered a range of operations, such as spilling at whatever rate is available (even if below 50 kcfs) and also turning spill off if spill levels drop below 75kcfs. Wills said that the group decided to continue the conversation at TMT, when more updated STP data would be available. He stressed that it is important to note that it is only April 2010 spring operations that are under discussion and not be indicative of the upcoming summer spill season operations. Wills also noted the hatchery releases scheduled for next week of 10 million fish above Bonneville and said the concern is that the bypass facility will become overloaded. Wills said this SOR was drafted with the intent to provide a “spread the risk” approach by providing whatever spill is available during this period in April when many fish are expected to pass the project and predation is expected to be at a high level.

The following parties provided input on the SOR and on the COE’s plan to stop spill if spill can’t be provided at/above 50 kcfs:

- Russ Kiefer, ID, noted that data indicates reduced direct smolt survival when spillway flows are between 50 and 80kcfs, and that 100 kcfs is better for fish. He acknowledged that the flow levels will likely be a long way from being able to provide desired spill levels. He added that as flat a spill level as possible would be best for fish. Kiefer stated that while Idaho is not opposed to the SOR, they were not comfortable with signing it.
- Rick Kruger, OR, noted that Oregon concurs with the concerns shared by Kiefer and that Oregon was just not comfortable signing the SOR, given the available data and in-water trade-offs. He clarified that Oregon does support providing spill at whatever level possible, as evenly as possible, throughout the day even if spillway flows drop below 50kcfs. He said conditions for fish are likely to be better in the spillway even with spill less than 50 kcfs as opposed to passage through the powerhouse. He added that the available data is not definitive enough to determine that 50 kcfs is the right cut off value during these unique spring conditions.
- Tom Lorz, CRITFC, noted that their goal is to ensure the best passage conditions and given that Bonneville will be passing more fish, priority should lie with Bonneville spill operations. He said that CRITFC opposed the COE’s proposed on/off operations, as not enough information exists to prove that operation would be better than spilling at less than 50 kcfs. Lorz suggested turning the sluiceway and unit 0 off, as a way to keep as much spill as possible passing through the spillway.
- Paul Wagner, NOAA, stressed the importance of carefully managing flows until such time that they increase later in the spring. He said that NOAA supports as uniform/flat spill pattern as possible and that given the latest information, NOAA supports spilling at levels below 50 kcfs.

Dan Feil, COE, clarified that flows of 48 kcfs (not including spill) is necessary to operate the Bonneville dam project and that the COE is required to maintain an elevation range of 262.5-264' at John Day pool beginning April 10 (and as John Day was at 264' on 4/7, the pool can't hold any more water.) He noted that if spill is to be maintained at 50 kcfs, river flows of around 100 kcfs are necessary. Feil said the COE planned to operate as specified at the beginning of the conversation, but that conversation amongst the Action Agencies and NOAA would be continuing over the next couple days. He added that the COE would do their best to maintain spill levels at or above 50 kcfs and BPA said they would make every effort to keep flows as smooth as possible; both agencies will be monitoring the project closely.

Action/Next Steps: Dan Feil, COE, said the COE will continue to discuss this issue internally, with the Action Agencies and NOAA over the next couple days. Feil said the COE will notify TMT members of the final plan via email, by end of day Friday 4/9. An update on Bonneville Low Flow Operations will be provided at the next TMT meeting on 4/14.

Operations Review

Reservoirs: Grand Coulee was at elevation 1276.4' with outflows supporting the Hanford Reach protection flows of 60 kcfs. Hungry Horse was at 3521.29', with 1.1 kcfs outflows and inflows of 1.5. Libby was at elevation 2403.17', with 2.0 kcfs inflows and 4.0 kcfs outflows. Albeni Falls was at 2052.84' with inflows of 15.5 kcfs, 6.2 out. Dworshak was at elevation 1528.19' with inflows of 3.6 kcfs and outflows of 1.2 kcfs. Lower Granite flows were at 30.2 kcfs, McNary flows were at 96.4 kcfs and Bonneville flows were at 104.4 kcfs.

Fish Paul Wagner, NOAA, directed TMT to the Fish Passage Center's two week passage index. He reported for juveniles: yearling Chinook were at 1,000-2,000 fish per day on the Snake River. Lower Granite had below 250. Bonneville was in the low 100's. Subyearlings were in the 2000 per day range. Steelhead numbers still low as the low flows are slowing passage down. Regarding adult passage, 229 Spring Chinook were passing Bonneville at a rate of 229 and Steelhead were passing at less than 100 per day. Lower Granite passage was in the 200 per day range. In looking at the 10 year historical data, this year's passage at Bonneville is tracking closely to 2009 data; Wagner noted that a sizable return was expected. Dave Wills, USFWS, updated TMT on the Dworshak Hatchery release of 1.1 million hatchery fish which he reported as having gone very well. He thanked the COE, BPA, Dworshak staff and all involved for their assistance in a successful operation.

Power Tony Norris, BPA, had nothing to report.

Water Quality: Scott English, COE, reported that there have been no TDG exceedances.

The next TMT meeting will be: a face to face on 4/14 at 9:00 am at COE.

Agenda items will include:

- Notes Review

- Updated Weather and Flood Control Forecasts
- Hanford Reach Update
- Transportation Update / ISAB Report
- 2010 Operations Updates: Low Flow Operations
- 2010 Water Management Plan comments due
- Operations Review

Future TMT meeting schedule:

4/21 - conference call
4/28 - face to face- COE
5/5 - face to face- COE
5/12 - conference call
5/19 - face to face- COE
5/26 - conference call

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES
April 7, 2010

Notetaker: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Doug Baus (COE) and facilitated by Erin Halton (DS Consulting). Representatives of USFWS, NOAA, Oregon, COE, BPA, CRITFC, BOR, Idaho and others attended. The following is a summary (not a verbatim transcript) of the topics discussed and decisions made. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for March 17, 24 and 31

Paul Wagner (NOAA) provided revisions to the March 17 minutes:

- *Section 8b. Low Flow Spill Operations, last paragraph:* "Wagner suggested shaping as much water as possible into May to boost spring flows for both Columbia and Snake River juvenile migrants," replaces, "...to boost spring migration in the Snake River."
- *Section 10. Transport Update, 2nd paragraph:* "Default mode is to spill in May," replaces, "... no spill in May."

In the March 31 minutes:

- *Section 8. Emergency Actions and Spill Priority Lists, first paragraph:* "The salmon managers anticipate there will be no involuntary spill this year," replaces, "...no voluntary spill this year."
- Tony Norris (BPA) revised *Section 6a. B2CC Operations, last sentence:* "BPA will try to flatten as much as possible the flow rate across the day," replaces, "...spill amounts of less than 75 kcfs will most likely be flat spill."

With these changes, the March 17 and 31 minutes will be considered final. There were no comments on the March 24 minutes so they were finalized today.

3. Updated Weather and Flood Control Forecasts

There's been a slight improvement in the forecasts according to the April 7 SNOTEL plot of current snow and water equivalents, linked to today's agenda. However, the situation is still not good, Baus reported. Water supplies are only 70-89% of normal throughout much of the basin and as low as 40-69% in some areas.

NOAA updated its 30-day forecast a few days ago, Kyle Dittmer (CRITFC) reported. The forecast is still essentially the same as it was when Dittmer briefed TMT two weeks ago – above-average chances of warm, dry conditions throughout the basin. He will provide the Australian Bureau of Meteorology's latest forecast of Pacific Ocean conditions at the next TMT meeting April 14.

The final RFC water supply forecast for April is due later today, Baus said. The April 1 RFC early bird forecasts are:

- The Dalles Dam – 66% of normal for April-August
- Libby Dam – 71% of normal for April-August
- Dworshak Dam – 53% of normal for April-July

The second link to this topic on today's agenda presents RFC data on current snow conditions. This graph also indicates a slight improvement in the water supply, but conditions remain below average.

4. Hanford Reach Update

Discussion of this topic was postponed until the May 14 meeting.

5. 2010 Operations

a. Bonneville Low Flow Spill Plan. In response to SOR 2010-01 recently submitted to the COE, Baus and Feil presented the COE's plan for low flow spring spill operations at Bonneville Dam. The 2010 Fish Operations Plan specifies a minimum spill of 75 kcfs at Bonneville, with coordination at TMT required for spilling less. The BiOp-recommended spill level for Bonneville is 100 kcfs, with 83 kcfs defined as the lower end for favorable passage conditions. However, under extreme low-flow conditions, lower spill levels may be considered and coordinated through TMT. Based on STP information, it's clear that spring flows at Bonneville will fall below the 75 kcfs minimum.

Therefore, the COE's low-flow plan for Bonneville is to spill until flows go as low as 50 kcfs. Minimum powerhouse discharge required to operate the project is 48 kcfs. If flows go below 50 kcfs, spill would be shut off until flows are sufficient to spill above 50 kcfs again.

Dave Wills (USFWS) then presented the system operational request, which was signed by USFWS and CRITFC and emailed to TMT members before today's meeting. Last week an in-depth technical meeting of FPOM and FFDRWG members addressed the problem of low spring flows at Bonneville. The FOP specifies a John Day elevation of 262.5-264 feet on April 10, and regional consensus is required to deviate from that operation. Not all stakeholders were present at the joint FFDRWG/FPOM meeting, so the SOR was drafted to capture ideas that were generated and present them to TMT.

SOR 2001-01 asks the COE to immediately begin filling John Day to create a reservoir in the lower river, where volume can be stored and released slowly to aid fish passage. The SOR requests a delay of several days in reaching the MOP elevation of 262.5-264 feet on April 10 so the stored volume can be used to supplement spring spill. The SOR also recommends that Bonneville spill a minimum of 50 kcfs if possible, with a target level of 75 kcfs from April 10 until inflows pick up in the lower Columbia River.

The John Day reservoir is currently at elevation 264 feet, which is the maximum April 10 elevation according to the FOP. Any water stored at John Day now would have to be released by April 10, making storage for Bonneville operations moot, Feil said. Tony Norris (BPA) noted that the 1.5 foot elevation band is an operating range, not augmentation volume. BPA is committed to working with the COE to flatten out the available spill at Bonneville to the greatest extent possible for the sake of fish passage.

Discussion turned to whether survival rates are higher through the Bonneville spillway or powerhouse at flows below 50 kcfs in April. The COE proposal to stop spill at 50 kcfs was based on studies showing that survival through the spillway is poor when spill volumes are less than 50 kcfs. However, there's a lack of survival data on which to base a low-flow operation in spring. The available data is for summer, when temperatures and predation rates are higher, impacting survival to a greater extent if spill volumes are low. Several fish managers said that spill below 50 kcfs after April 10 would be preferable to no spill, given that on April 12-13, some 10 million smolts are scheduled to be released from hatcheries upstream of Bonneville Dam. Also, there are known problems with gateway crowding and powerhouse passage.

The Salmon Managers (Washington and Montana were not present) gave their views of the SOR and the COE proposal for Bonneville operations:

- **USFWS** –Shutting off spill would overcrowd the bypass and turbines, subjecting large numbers of smolts to unfavorable passage conditions. Favored spilling even if flows are below 50 kcfs – any amount of spill is better than none. Objected to operating the B2CC with no spill to keep flows from circulating into the tailrace.
- **Oregon** – Objected to the COE's plan to shut off spill at 50 kcfs. Spill levels above 50 kcfs are desirable, but spill should continue even if flows are less. Exposing fish to spillway conditions below 50 kcfs is clearly preferable to what they would experience passing through the powerhouse. Didn't object to using John Day storage for flow augmentation, but agreed with NOAA that it probably wouldn't provide enough water to solve the problem; agreed with Idaho that delaying fish at John Day might not be worth it.
- **NOAA** – Spilling less than 50 kcfs is acceptable because there's no known cutoff point at which spillway conditions are worse than passage

through the powerhouse at this time of year. Implementing the John Day provisions of the SOR would not produce enough extra water to solve the problems at Bonneville caused by low flows.

- **CRITFC** –The sheer number of fish scheduled to be released warrants provision of minimal conditions at Bonneville for good survival. By comparison, there would be fewer fish in the John Day pool to be affected by implementing the SOR. Objected to turning the spillway off and on.
- **Idaho** – Didn't oppose SOR 2020-01 but didn't sign it. The tradeoff involved – potentially delaying fish in the John Day pool in order to provide slightly better conditions at Bonneville – might not be worth it. Didn't object to the COE proposal to shut off spill at 50 kcfs.

The COE will confer internally and with the other Action Agencies before making a final decision, and will notify TMT of the final Bonneville operation via email. TMT will revisit this issue at its next meeting April 14.

(In a 4-9-10 email, the COE informed TMT that spill in April 2010 will continue at all river levels, due to the very low flows, low temperatures and assumed lower rates of predation in spring.)

b. Bonneville Unit Operations for Spring Creek Release. USFWS is still working on specifying the Bonneville unit operations for the Spring Creek release and will coordinate with the COE on that before the next TMT meeting. Typically, the operation is from the midpoint to the bottom end of 1% efficiency, Wills said. Line and station repair work is scheduled for April 10 at Bonneville, and the Spring Creek fish will be released April 12 or 13. USFWS will monitor their passage at the project. Norris suggested coordinating with hatchery personnel as early as January to plan releases if flows are low in future years.

6. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,276.4 feet, releasing 60 kcfs for Hanford Reach protection flows, John Roache (BOR) reported. Hungry Horse is at elevation 3,521.29 feet, with inflows of 1.5 kcfs and discharges around 1.1 kcfs. Libby is at elevation 2,403.17 feet, with inflows of 2.0 kcfs and outflows of 4.0 kcfs.

Albeni Falls is at elevation 2,052.84 feet, with 15.5 kcfs inflows and 1.2 kcfs outflows. Dworshak is at elevation 1,528.19 feet, with inflows of 3.6 kcfs and outflows of 1.2 kcfs

Lower Granite inflows are 30.2 kcfs; McNary inflows are 96.4 kcfs; and Bonneville inflows are 104.4 kcfs.

b. Fish. Juveniles: At the Salmon River trap, the two-week passage index shows 1,000-2,000 yearling Chinook passing in the past week, mostly hatchery

fish. At the Imnaha trap, there were about 1,000-1,800 fish over the past few days. Lower Granite passage counts have stayed below 250 fish per day. Subyearling Chinook passage rates at Bonneville are 600-2,000 fish per day. Steelhead passage numbers at Bonneville are low but expected to increase. Dave Wills announced that last week's release of 1.1 million fish from Dworshak hatchery went well, thanks to careful coordination between BPA, COE and Dworshak staff.

Adults: Yesterday 229 Spring Chinook passed Bonneville, the largest count yet for 2010. Steelhead are passing Bonneville at the rate of less than 100 fish per day. Steelhead winter holdovers are still passing Lower Granite at the rate of about 100 fish per day. In terms of run timing, the passage of 292 adult spring Chinook at Bonneville is similar to last year's passage but far below the 10-year passage index of 2,900 fish. There should be a significant increase in adult spring Chinook numbers in the next two weeks, according to Washington's run projections for 2010.

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

d. Water Quality. All TDG gages are operating, and no exceedances have been reported. Spill operations are currently underway on the Snake River.

12. Next Meeting

The next TMT meeting will be April 14 at the COE NW division office. Topics covered will include updates on most of today's agenda items, plus an update on Hanford Reach protection flows, and comments on the WMP.

<i>Name</i>	<i>Affiliation</i>
Rick Kruger	Oregon
David Wills	USFWS
Paul Wagner	NOAA
Doug Baus	COE
Tony Norris	BPA
Kyle Dittmer	CRITFC
Dan Feil	COE
Holli Krebs	JP Morgan
Laura Hamilton	COE
Scott English	COE
Bill Proctor	COE
Russ George	WMC

Phone:

John Roache	BOR
Russ Kiefer	Idaho
John Hart	EWEB
Tim Heizenrader	Centaurus
Margaret Filardo	FPC

Bill Rudolph
Ruth Burris
Barry Espenson
Mark Trautman
Sherry XX
Greg Lawson
Tom Le
Kelly XX
Mike Butchko
Richelle Beck

NW Fish Letter
PGE
CBB
BP Energy
Puget Power
Pt. Carver
Puget Sound Energy
Snohomish PUD
Powerex
DRA

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday April 14, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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4. Hanford Reach Update - Russell Langshaw, Grant County PUD
 - a. [Priest Rapids Operation 2010](#)
5. 2010 Operations - Steve Barton, COE-RCC
 - a. Bonneville Spill Plan
 - b. Libby Spring Operations
 - i. [Water Supply Forecast](#)
 - ii. [Operations](#)
 - c. Grand Coulee Flow Augmentation

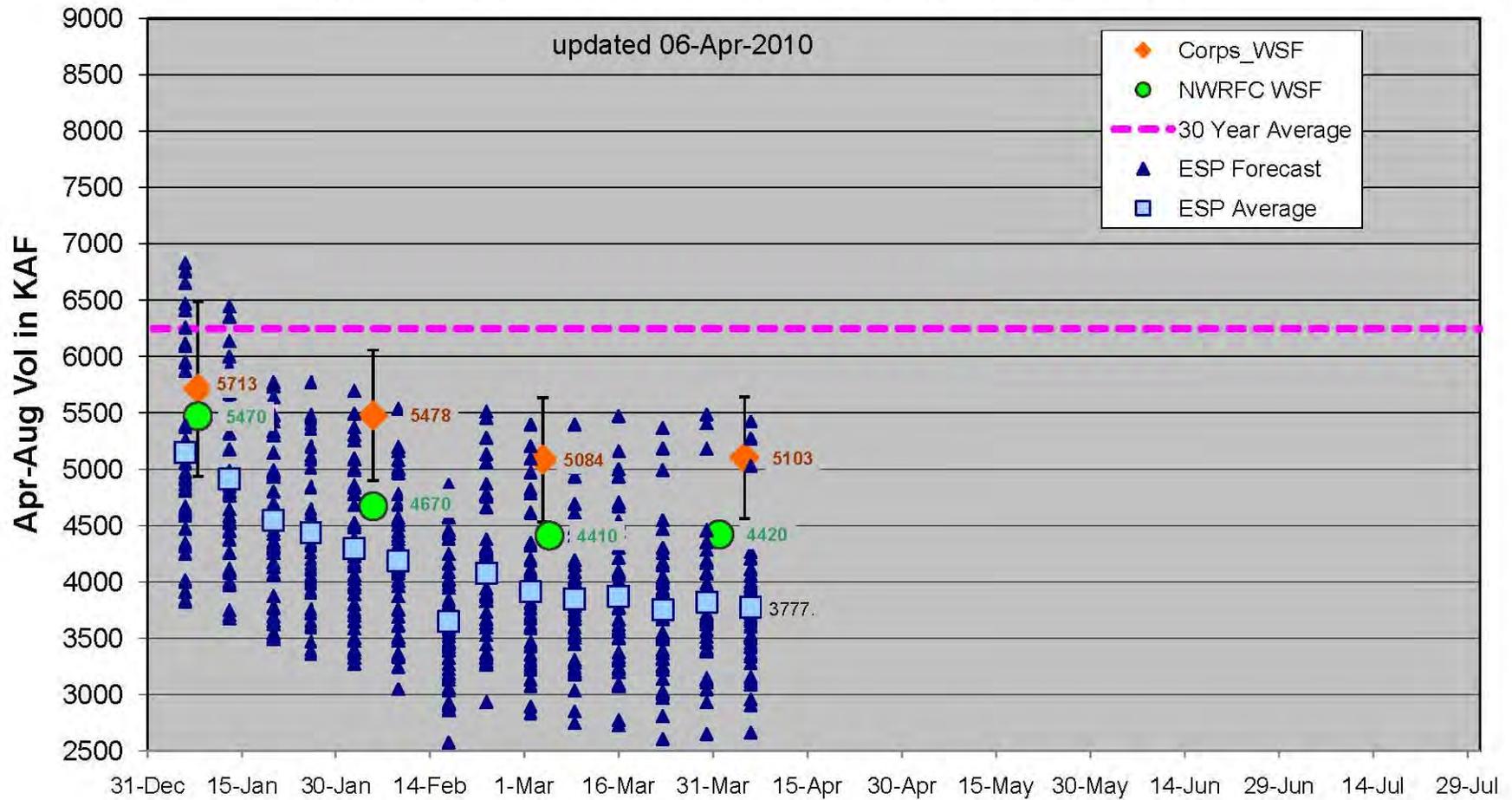
6. Transportation Update - *Steve Barton, COE-RCC*
7. WMP Comments Due April 10 - *Steve Barton, COE-RCC*
8. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality
9. Other
 - a. Set agenda and date for next meeting - **April 21, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

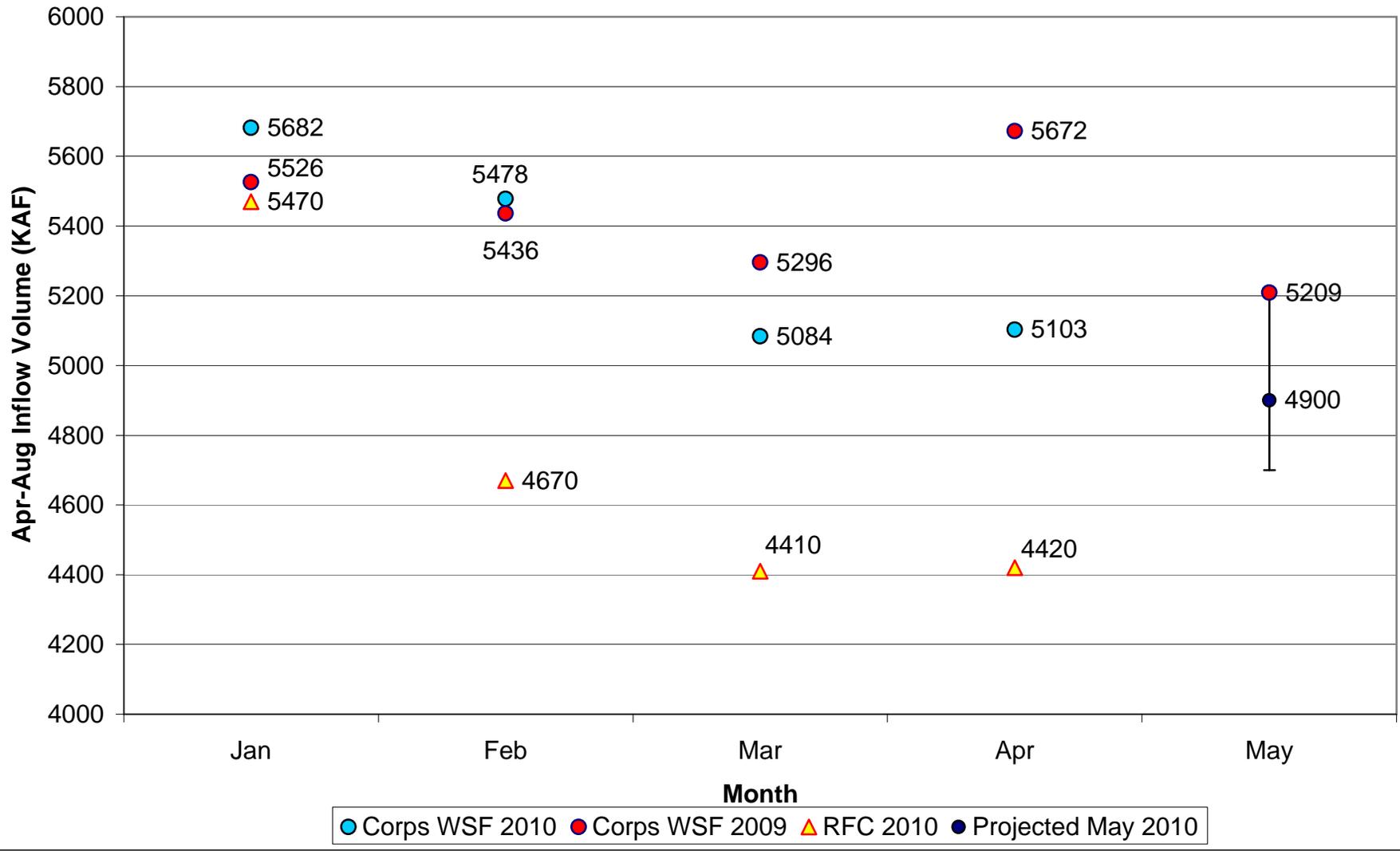
[Steve Barton](#) at (503) 808-3945, or

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

Libby, MT Water Supply Forecast April-August Forecast Comparison for WY2010



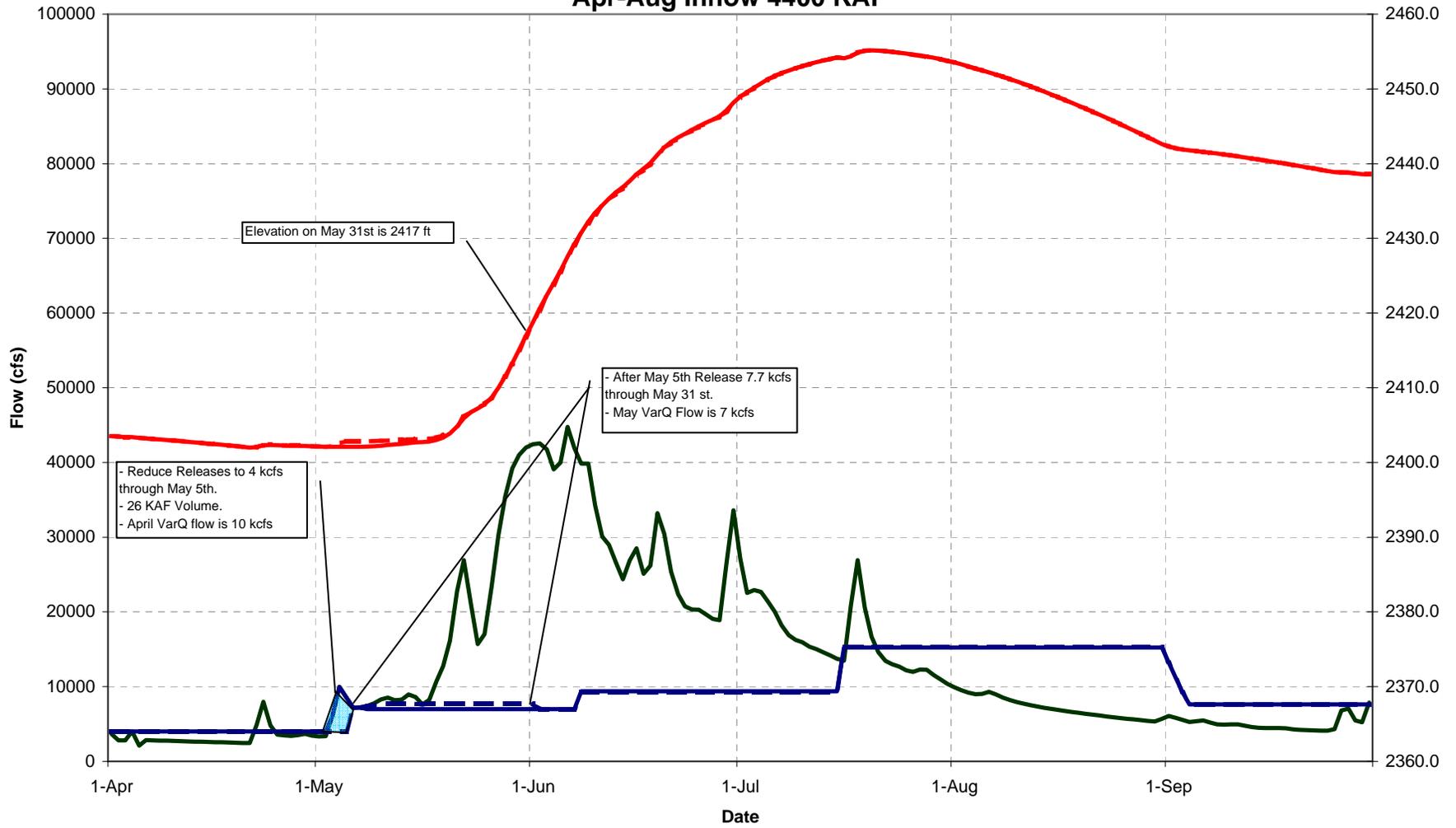
Corps Libby Dam Water Supply forecasts for 2009/2010 compared to RFC Forecast of 2010



Libby Dam and Reservoir

Water Year 2010 - Tier 1

Apr-Aug Inflow 4400 KAF

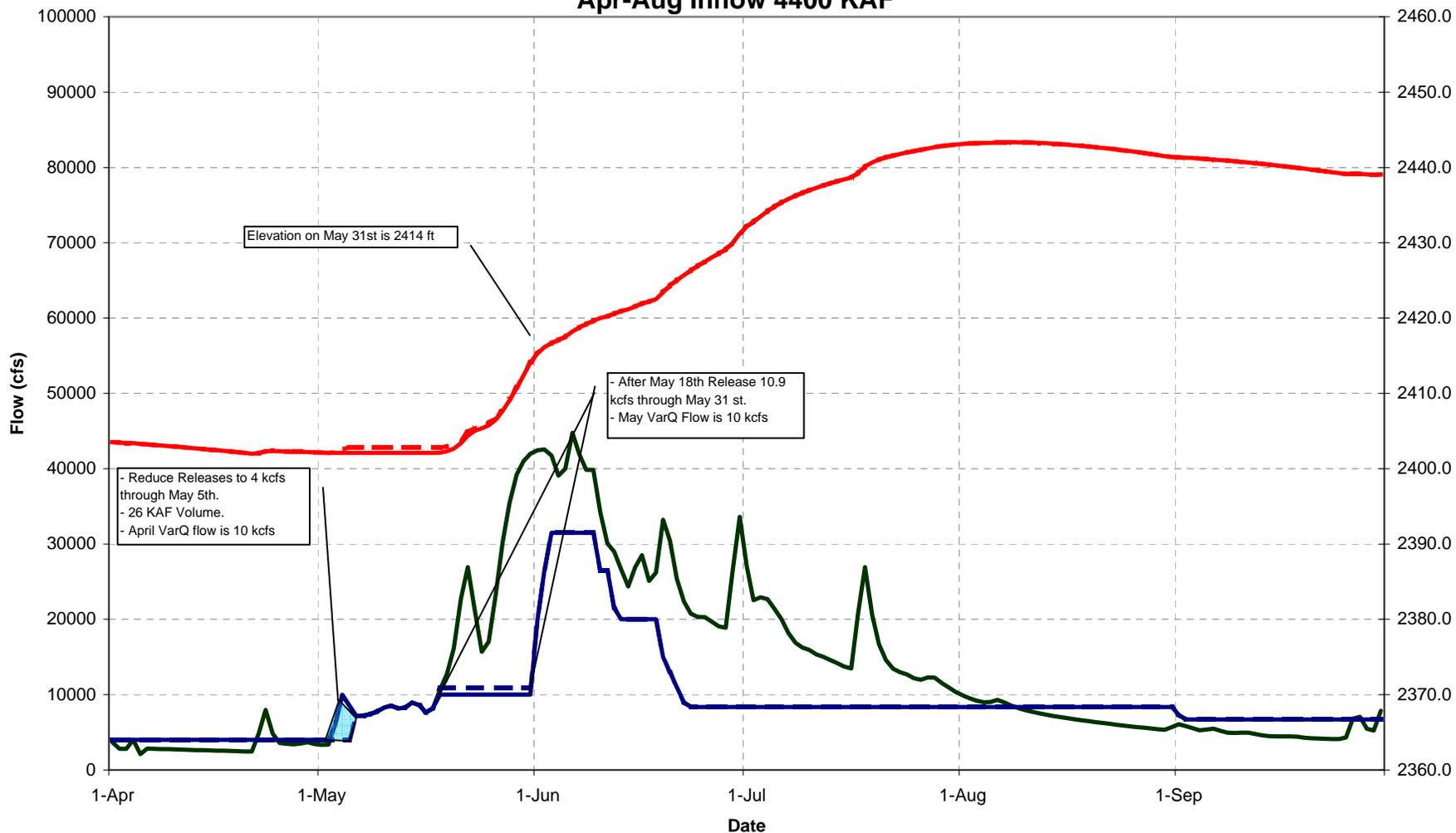


— Inflow
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 — Outflow Deviation
 — Elevation VARQ
 — Elevation Deviation

Libby Dam and Reservoir

Water Year 2010 - Tier 2

Apr-Aug Inflow 4400 KAF

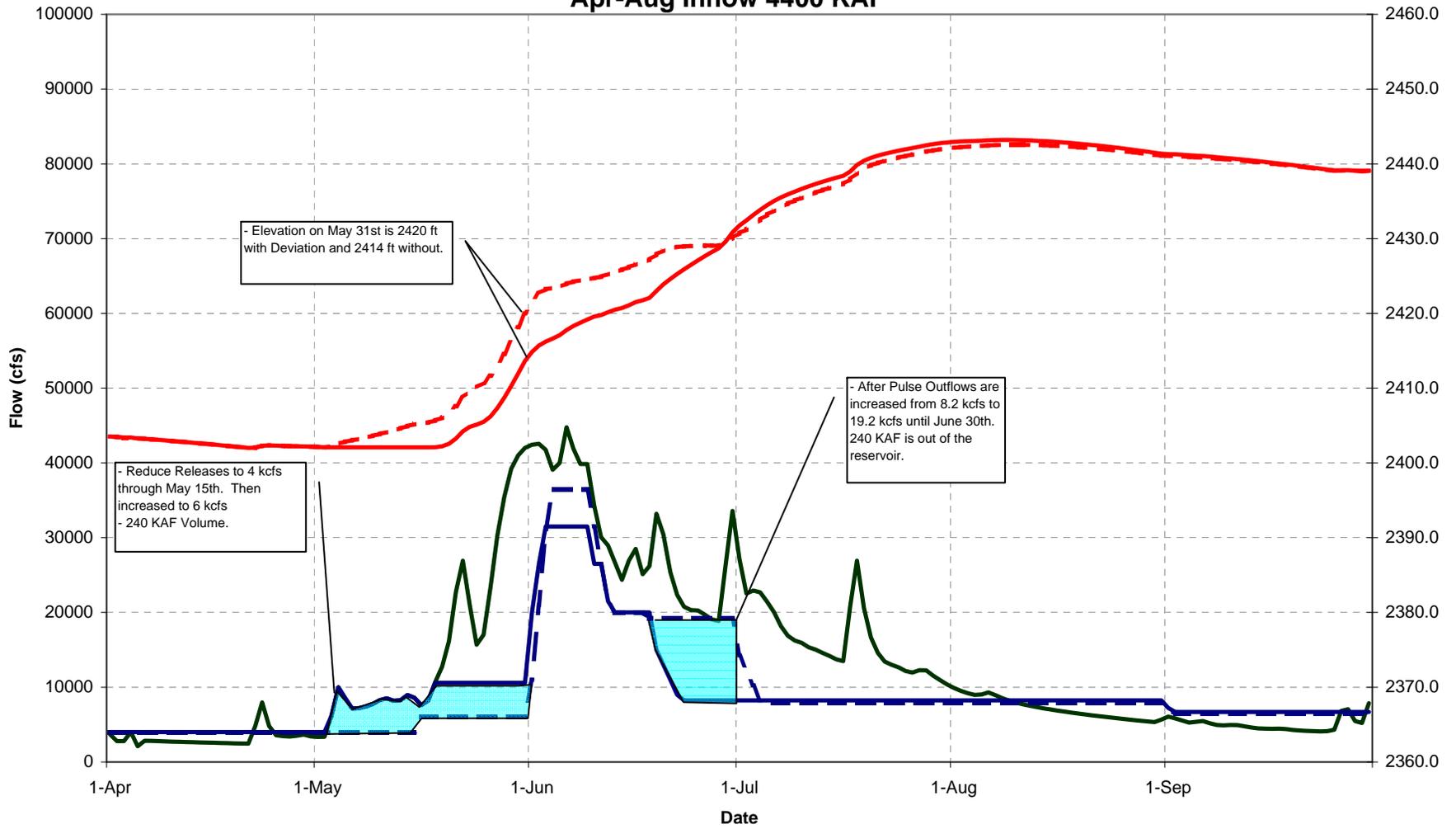


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 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir

Water Year 2010 - Tier 2

Apr-Aug Inflow 4400 KAF

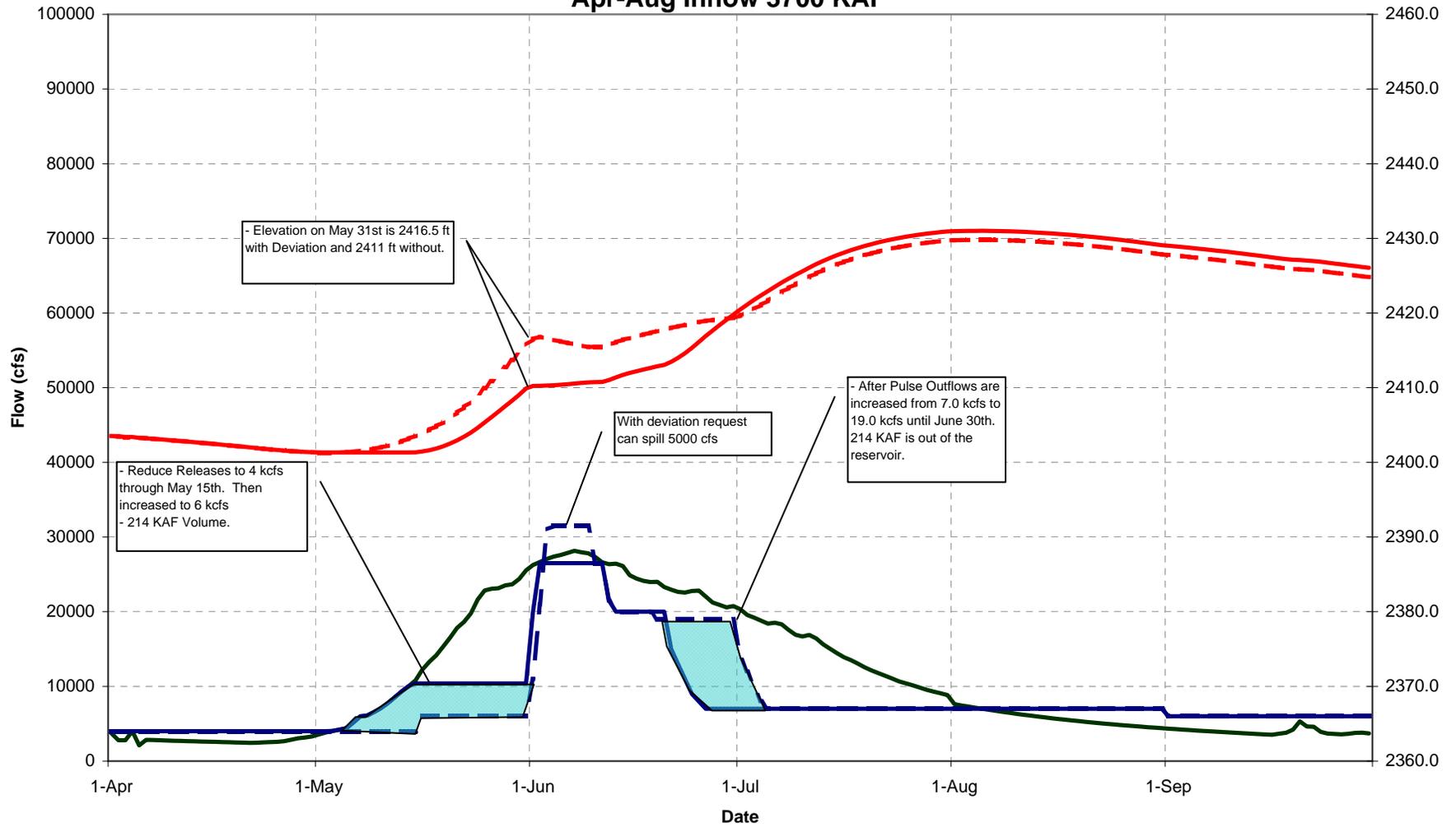


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 — Elevation VARQ
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Libby Dam and Reservoir

Water Year 2010 - Tier 2 STP

Apr-Aug Inflow 3700 KAF

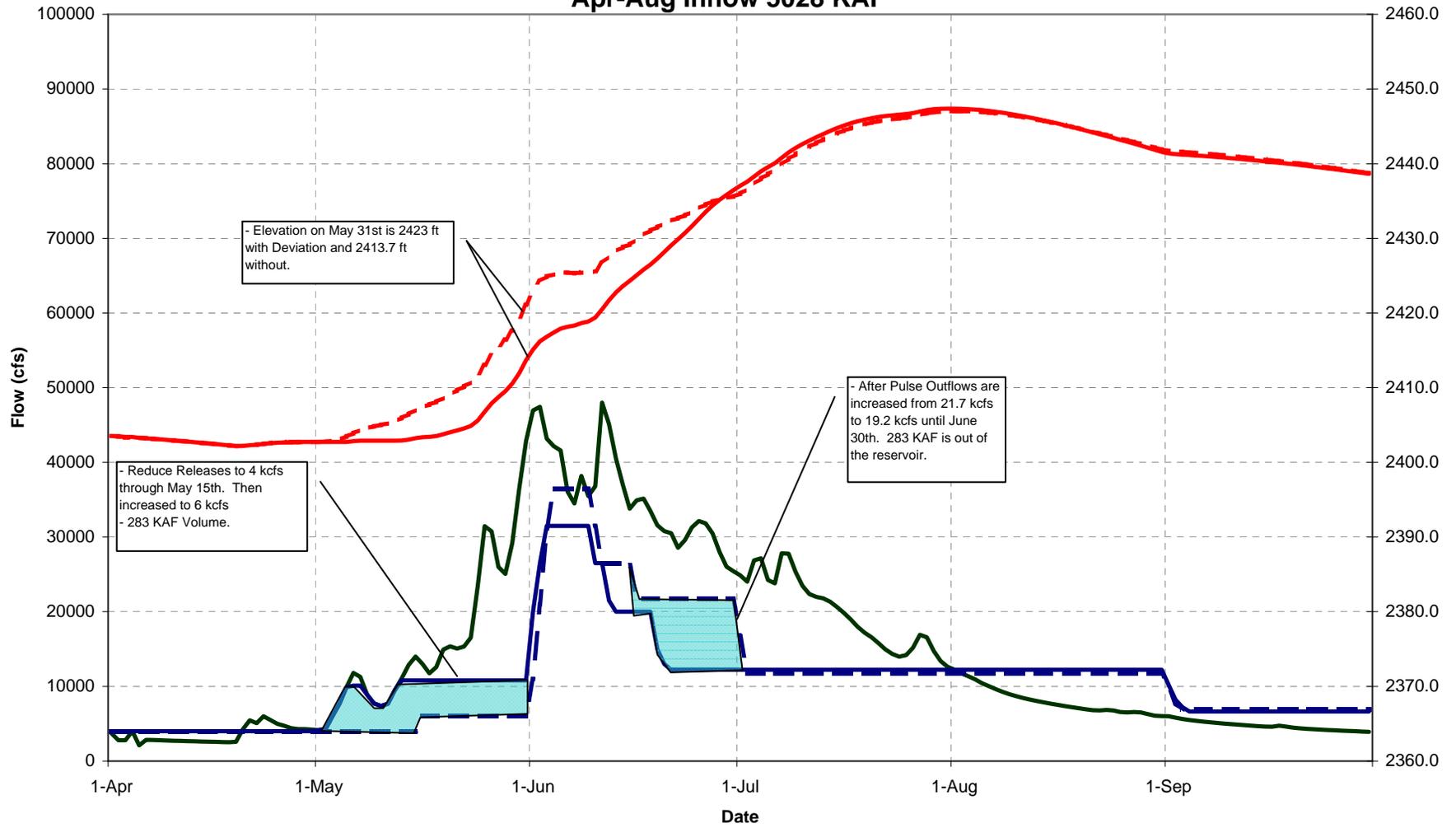


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 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir

Water Year 2010 - Tier 2

Apr-Aug Inflow 5028 KAF

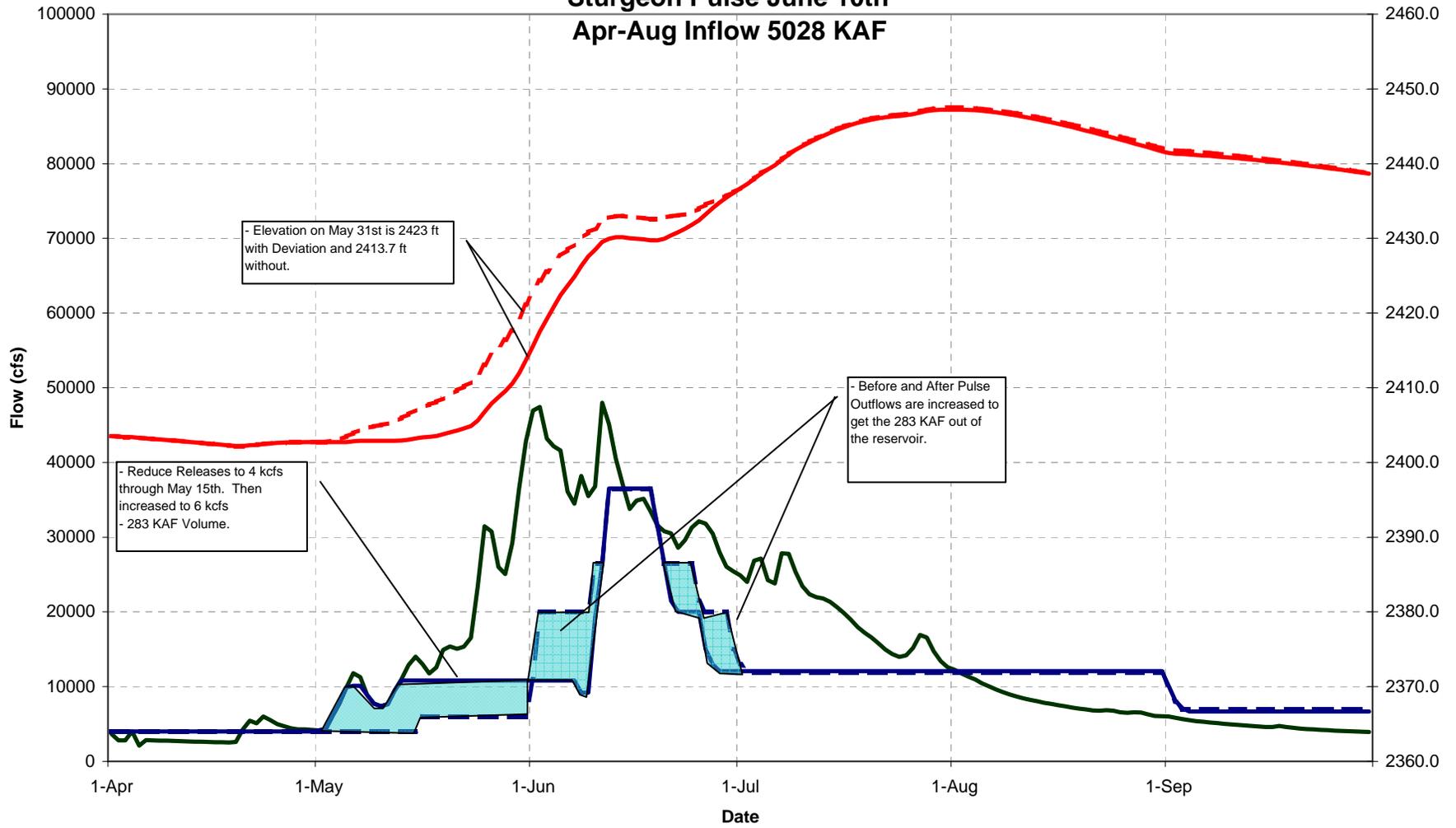


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 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir

Water Year 2010 - Tier 2 and Sturgeon Pulse June 10th

Apr-Aug Inflow 5028 KAF

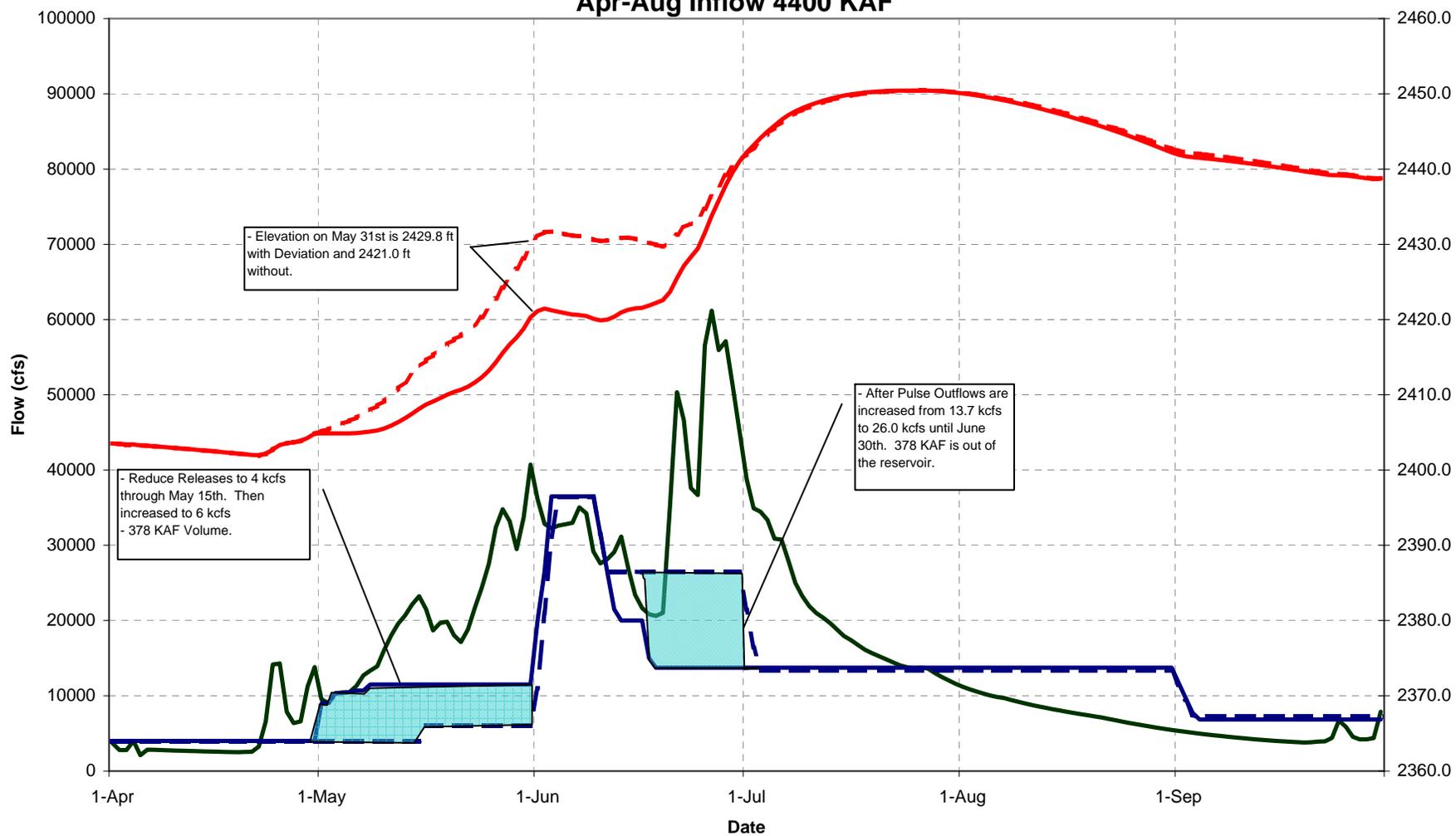


— Inflow
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir

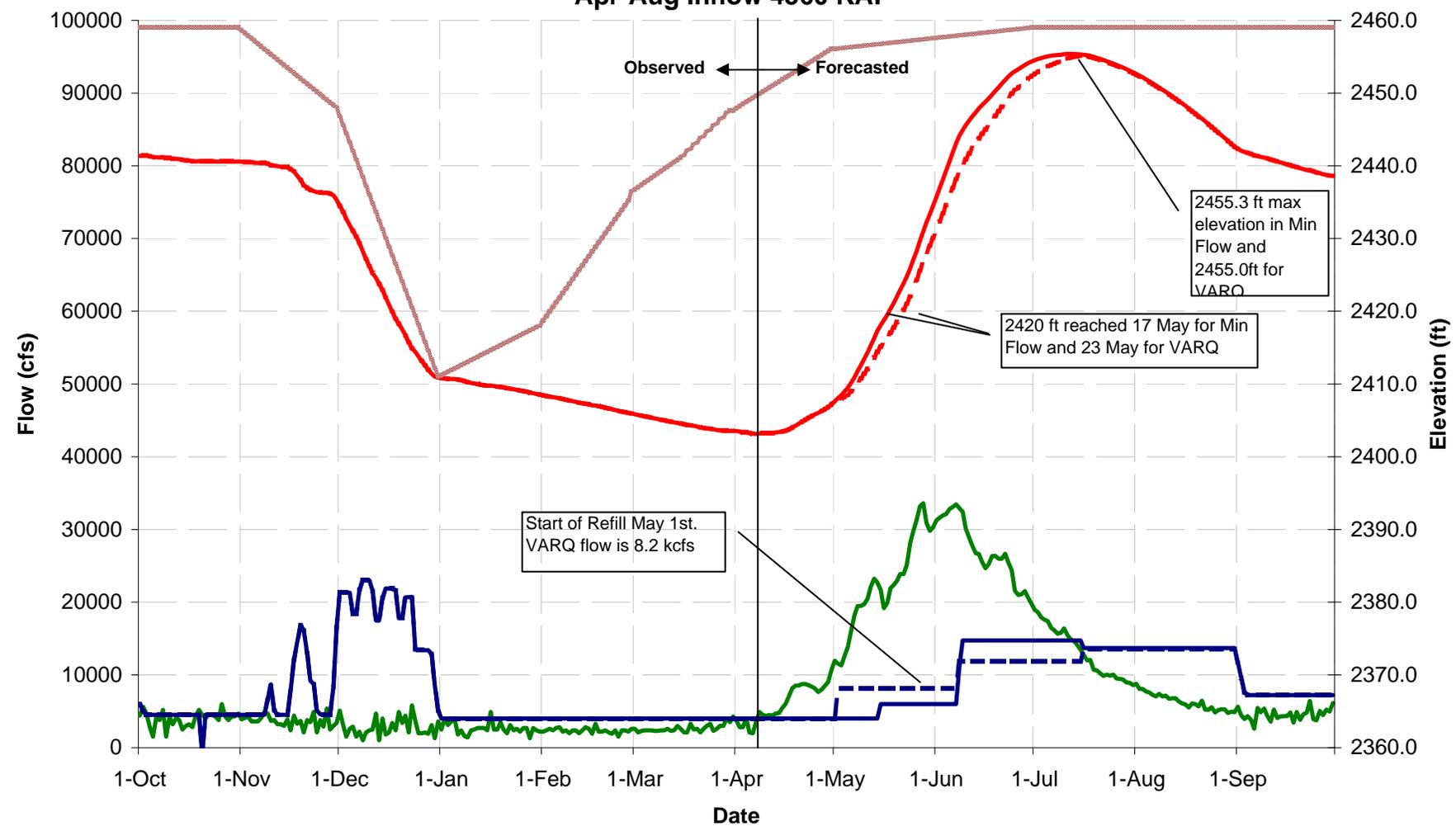
Water Year 2010 - Tier 2

Apr-Aug Inflow 4400 KAF



— Inflow
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir Water Year 2010 - Low Year Apr-Aug Inflow 4560 KAF

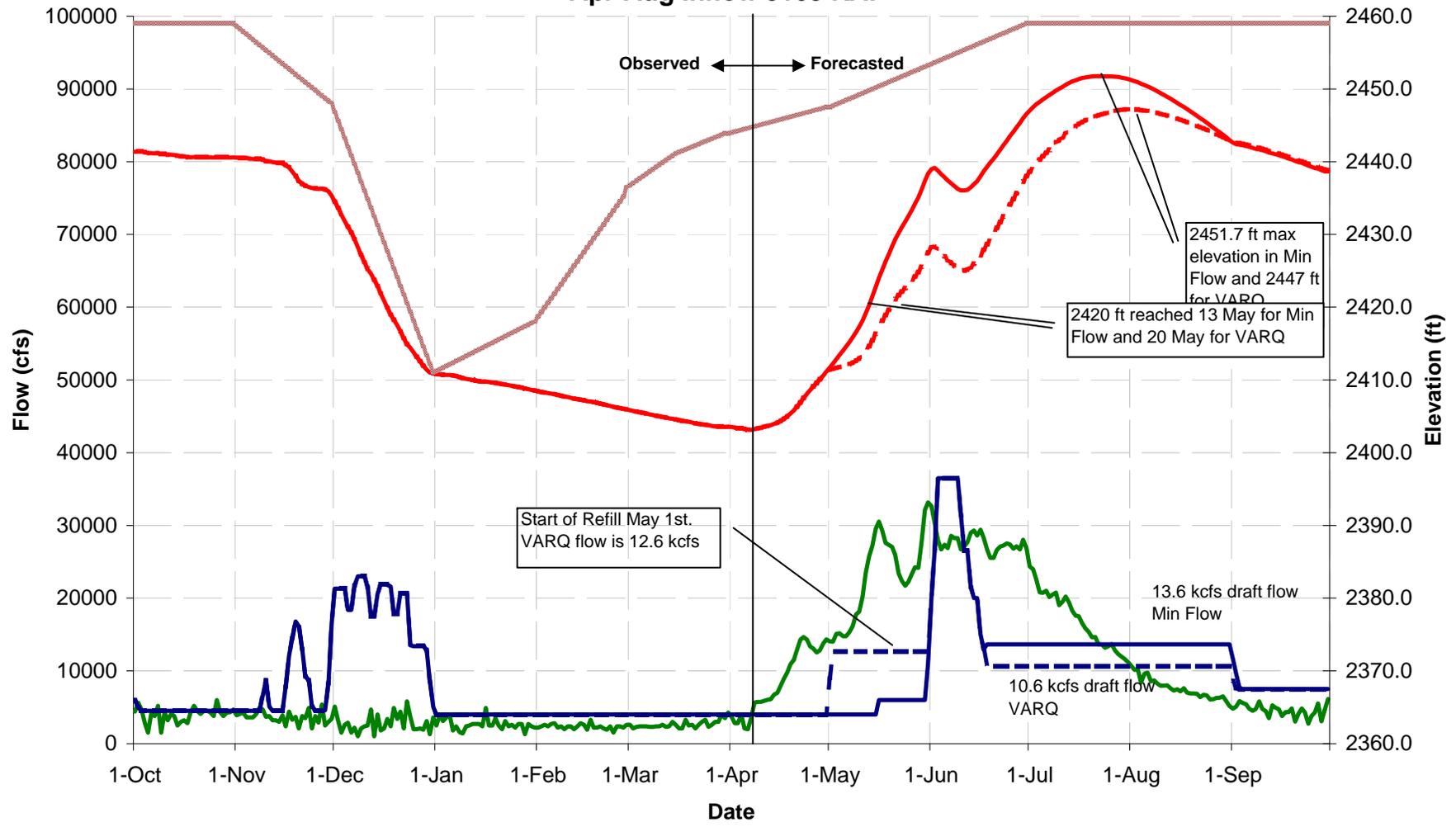


— Inflow
 — Outflow VARQ
 — Outflow Min Flow
 — Elevation VARQ
 — Elevation Min Flow
 — Flood Control

Libby Dam and Reservoir

Water Year 2010 - Median Year

Apr-Aug Inflow 5103 KAF

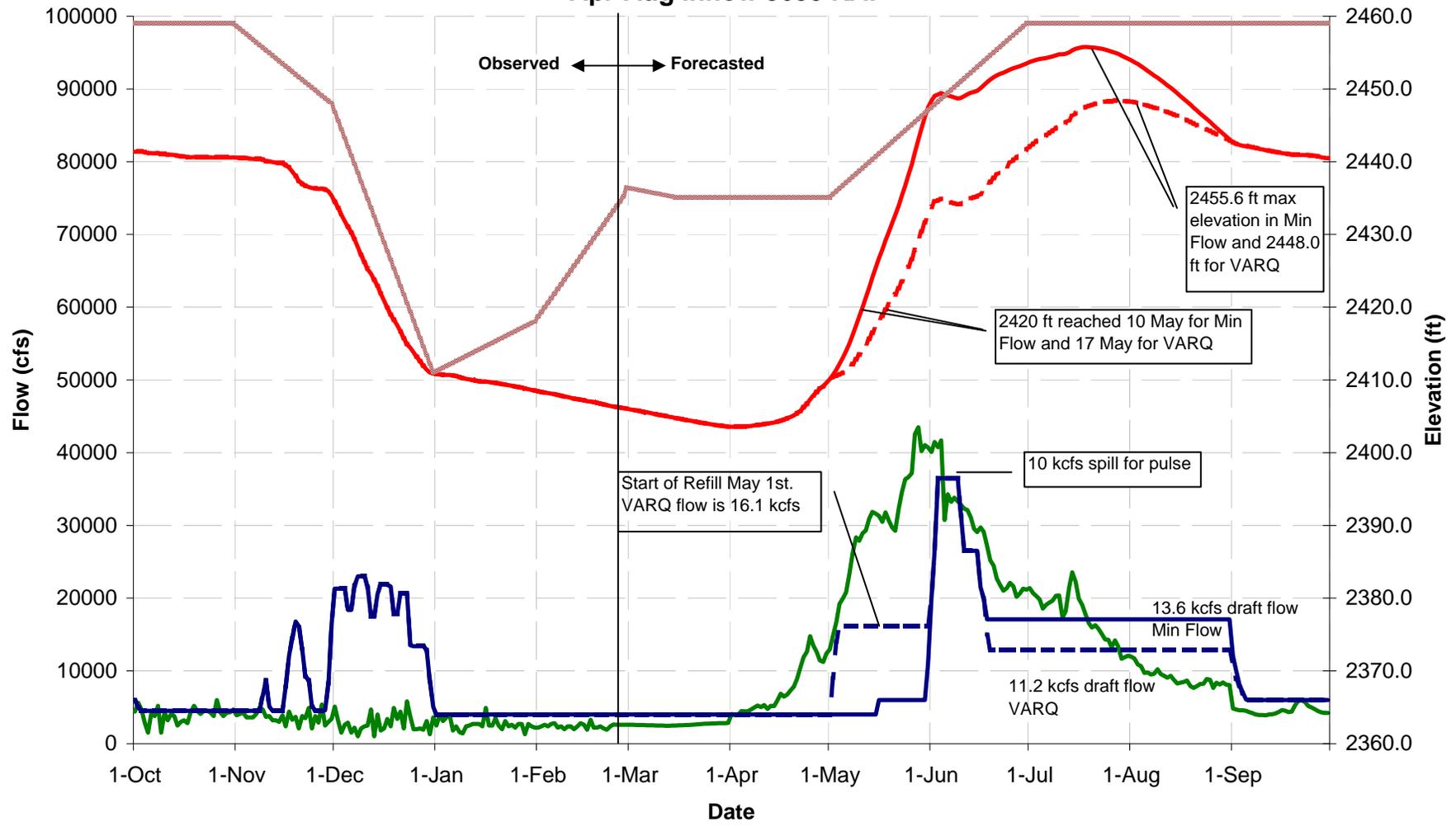


— Inflow
 — Outflow VARQ
 — Outflow Min Flow
 — Elevation VARQ
 — Elevation Min Flow
 — Flood Control

Libby Dam and Reservoir

Water Year 2010 - High Year

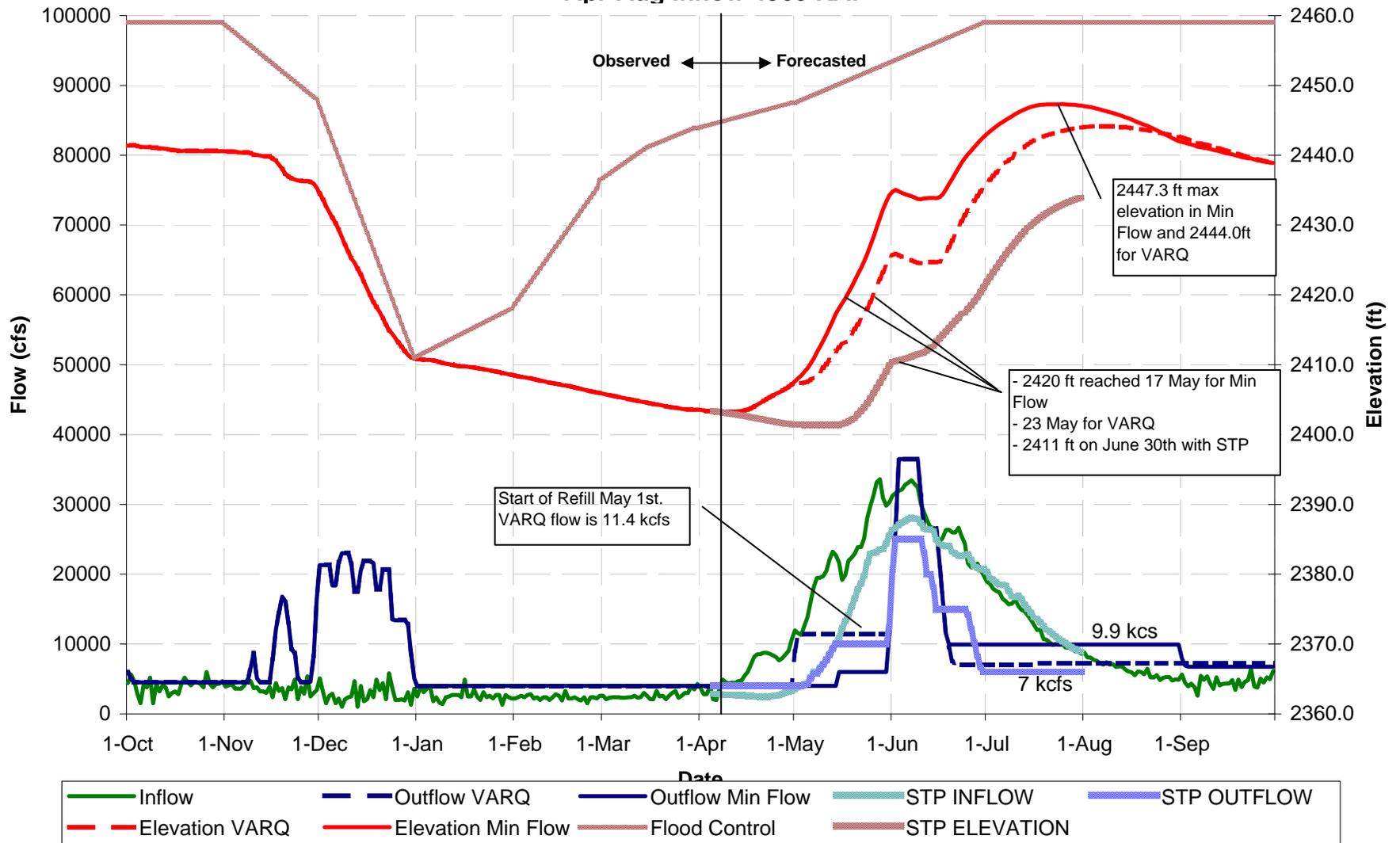
Apr-Aug Inflow 5650 KAF

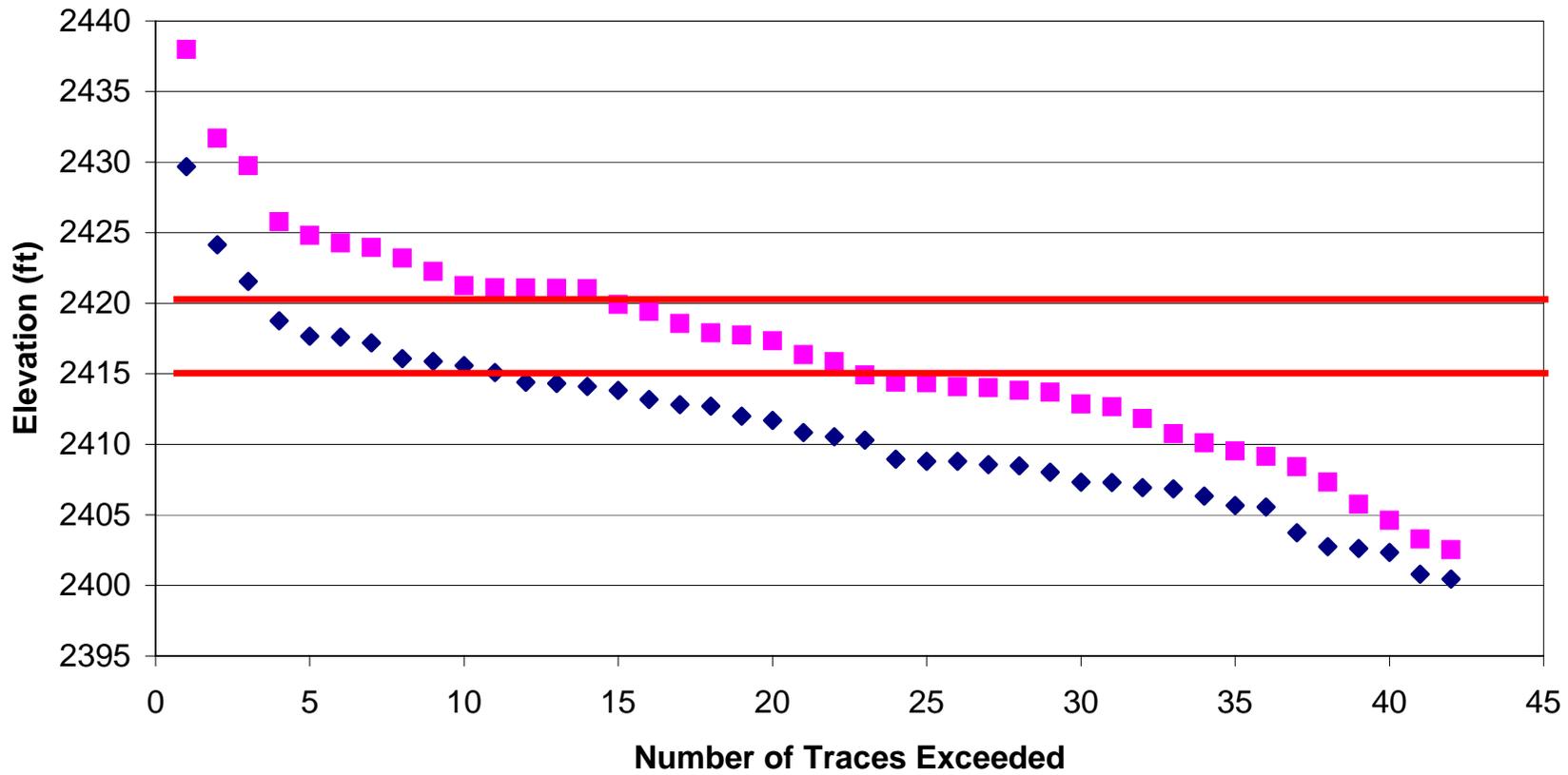


Libby Dam and Reservoir

Water Year 2010 - Low Year with Tier 2 Year

Apr-Aug Inflow 4560 KAF



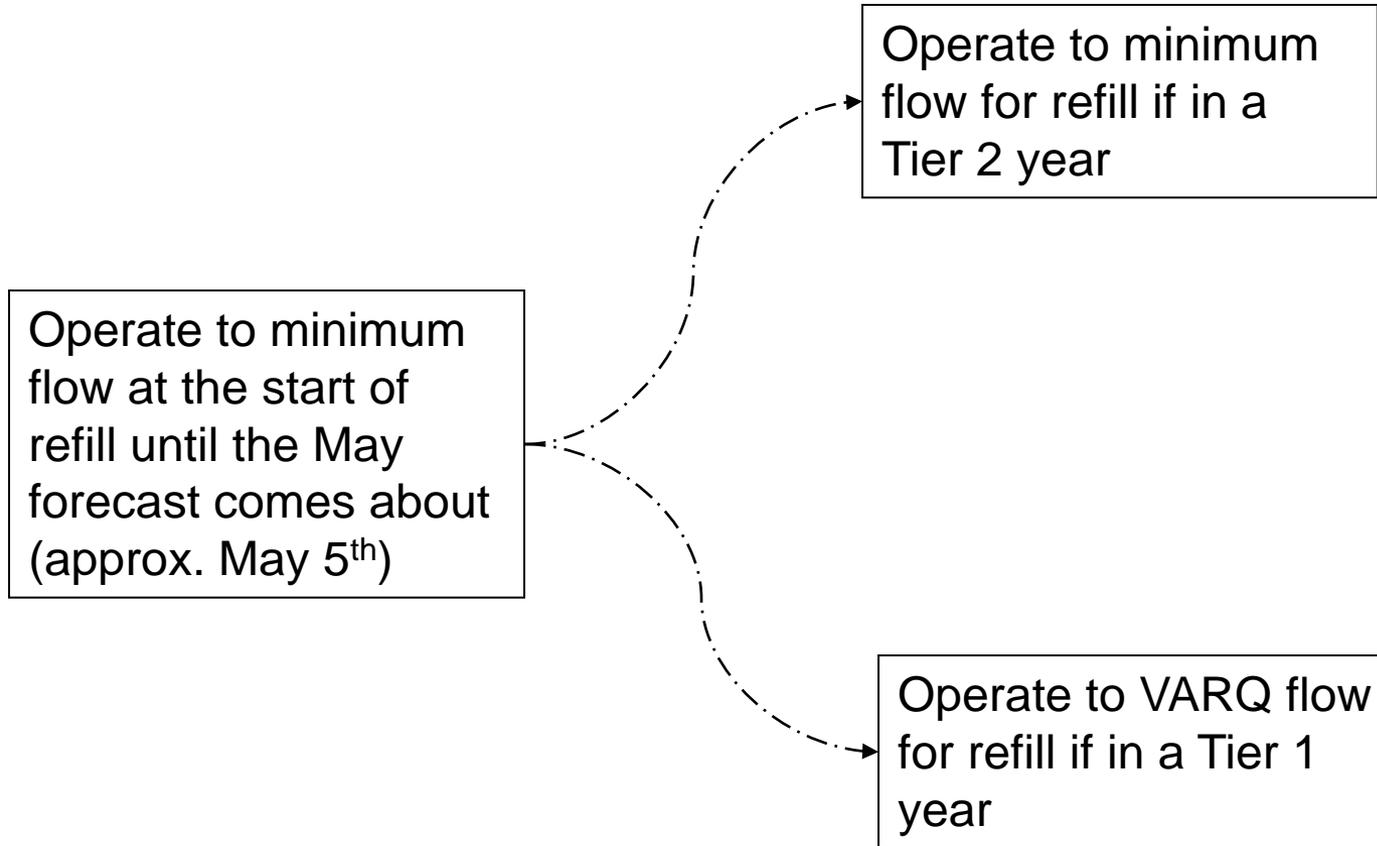


◆ May 31 Elevation VARQ ■ May 31 Elevation Revised Operation

Phase I

- Hold minimum flows after start of refill (projected May 1st) until the May Water Supply Forecast (WSF) is issued.
 - In Tier 1 or 2 year get the volume out by May 31st.
- See Phase I graphs

Libby Operations – WY 2010 Decision Points



Phase II

- Tier 2 year declared by WSF being between 4800 – 5400 KAF.
 - Hold 4 kcfs through May 14th then increase to 6 kcfs on May 15th until the Sturgeon Operation starts
 - Increases the chance to spill Libby Dam as part of the settlement agreement
- A second alternative is to take the volume difference in May and release that same volume around the pulse
 - Flow Neutral
- One alternative is to target a flow to reach 2443 ft Aug 31st and then 2439 ft end of Sept.

Alt 1: Flow Neutral

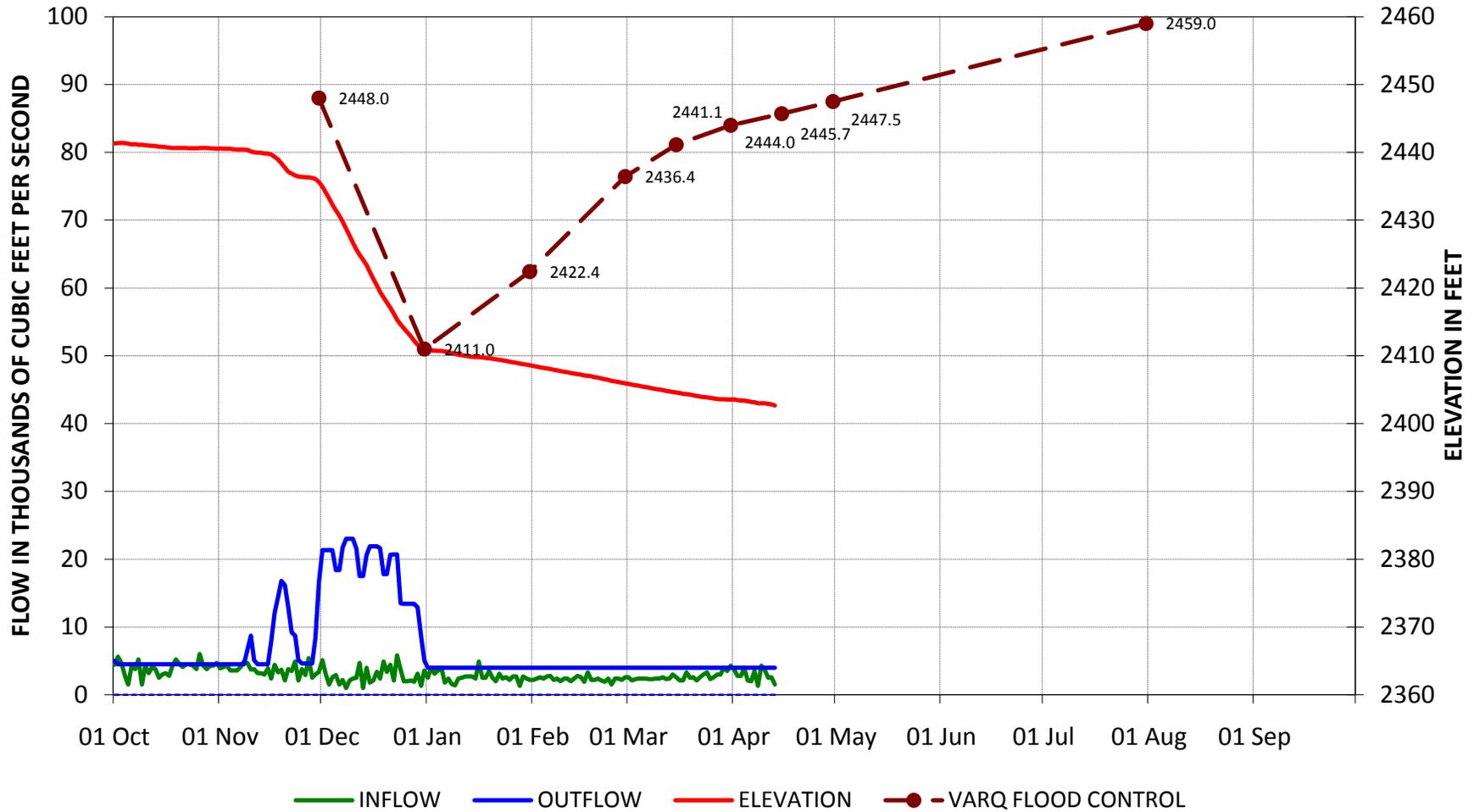
- Start of Refill is May 1st
- June 1st start of pulse
 - Sturgeon operations started June 10th last year
- Hydrographs are actual ESP traces
- Libby Dam can spill 5 kcfs if at elevation 2415 ft and 10 kcfs at elevation 2420 ft.
- After June 30th target 2443 ft 31 Aug

Alt 2: Regulation to target elevations

- Start of Refill is May 1st
- June 1st start of pulse
- Hydrographs are synthetic daily average pattern for each inflow scenario
- Libby Dam can spill 5 kcfs if at elevation 2415 ft and 10 kcfs at elevation 2420 ft.
- See graphs with that target 2443 ft

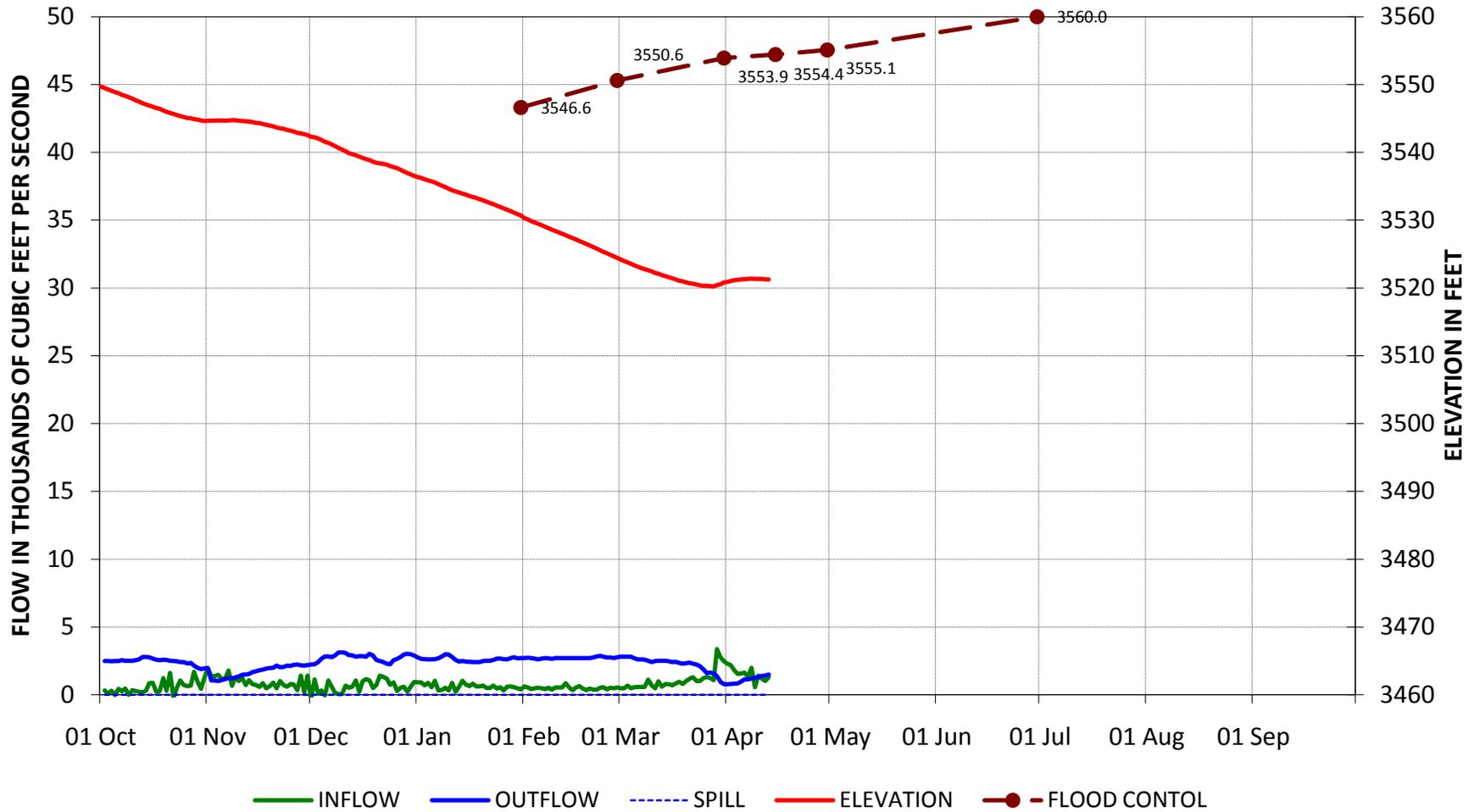
LIBBY DAM AND RESERVOIR

Water Year 2010



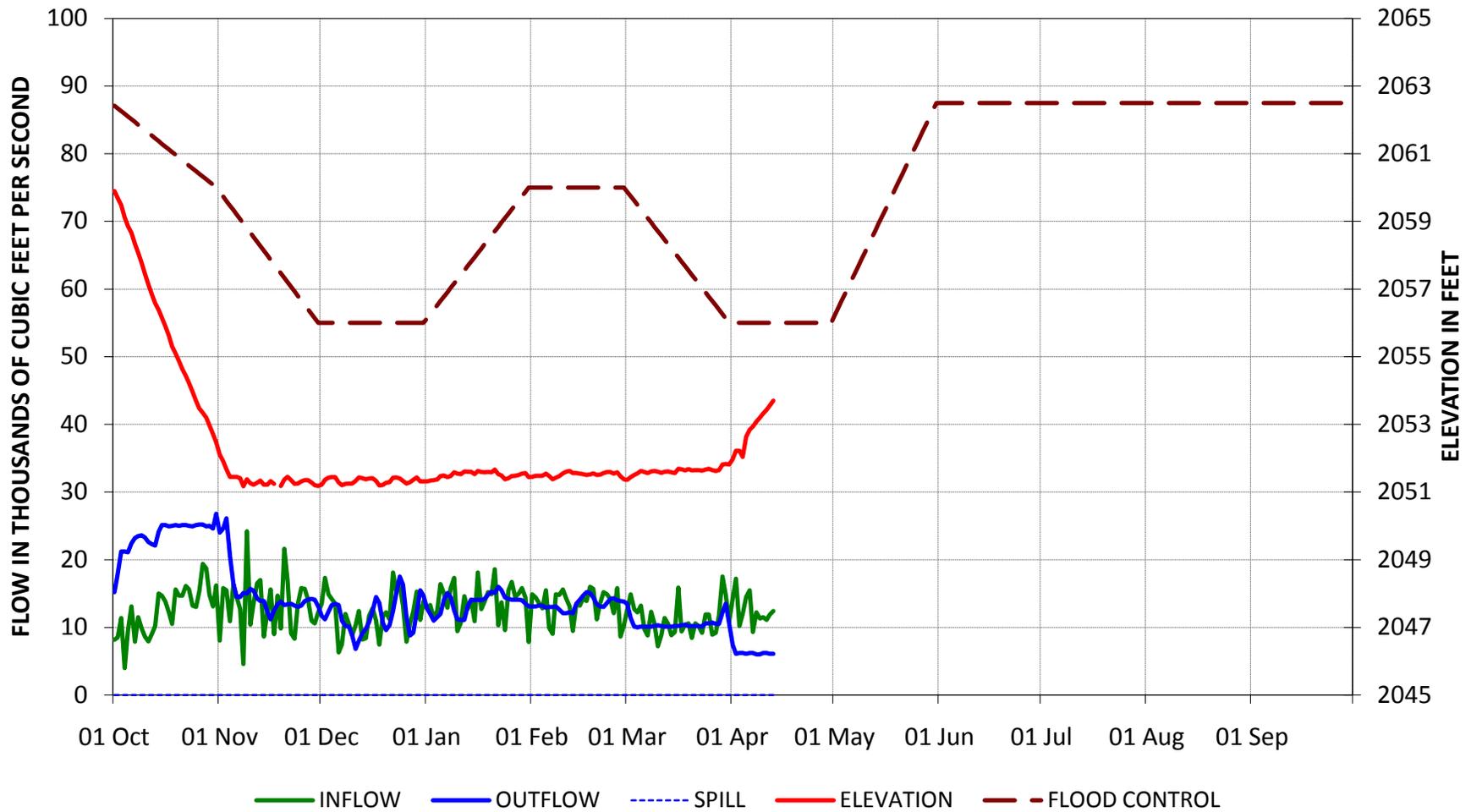
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



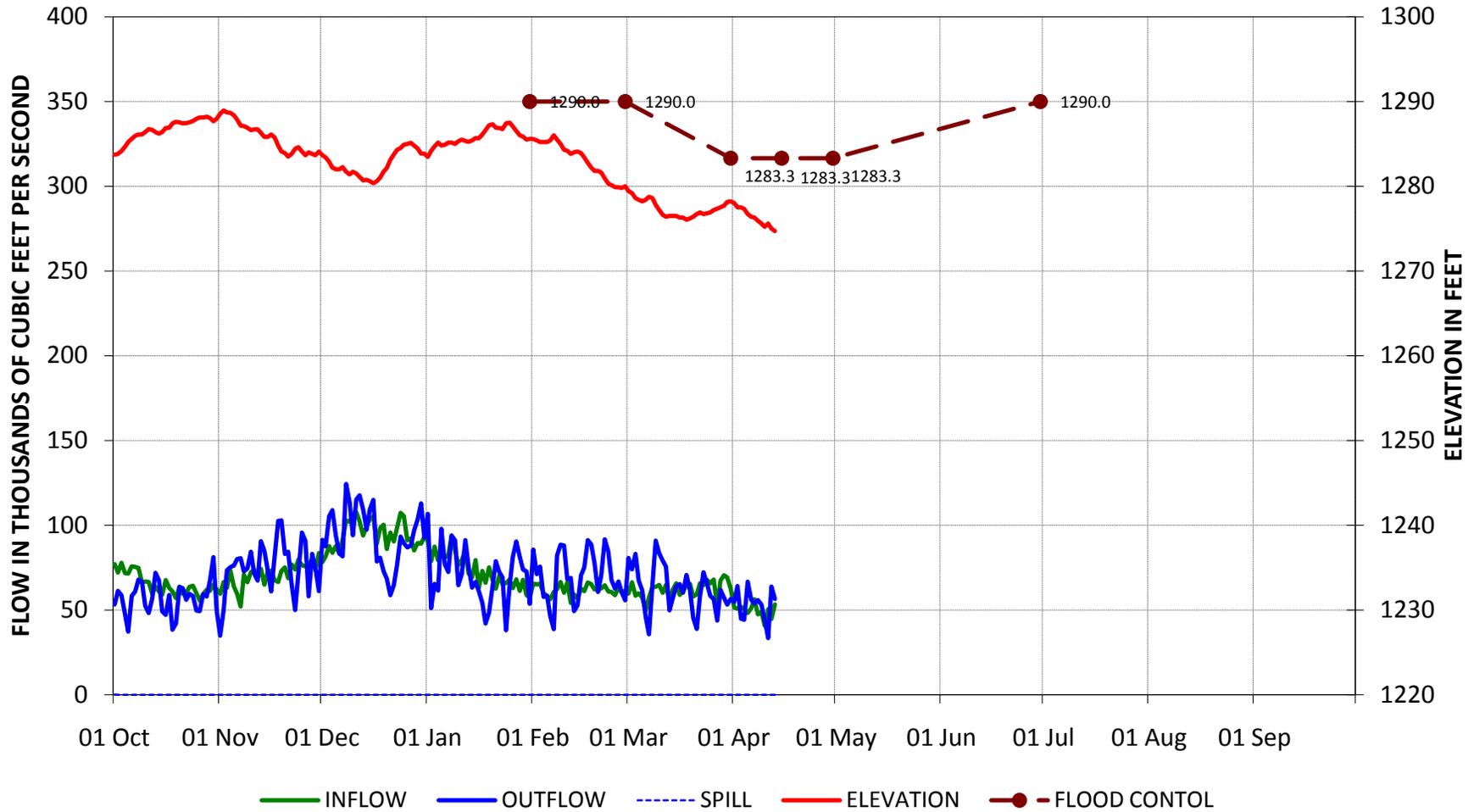
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



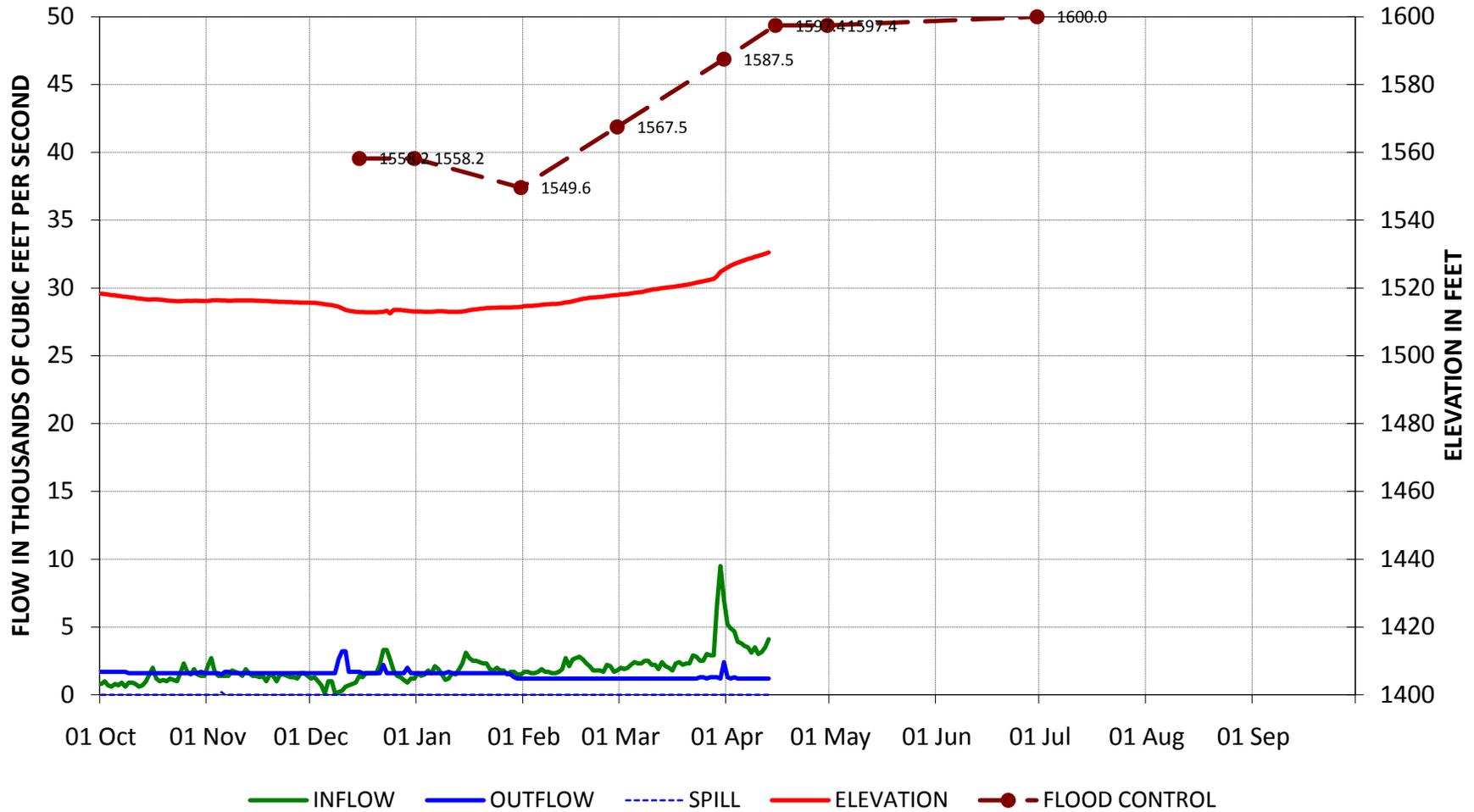
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



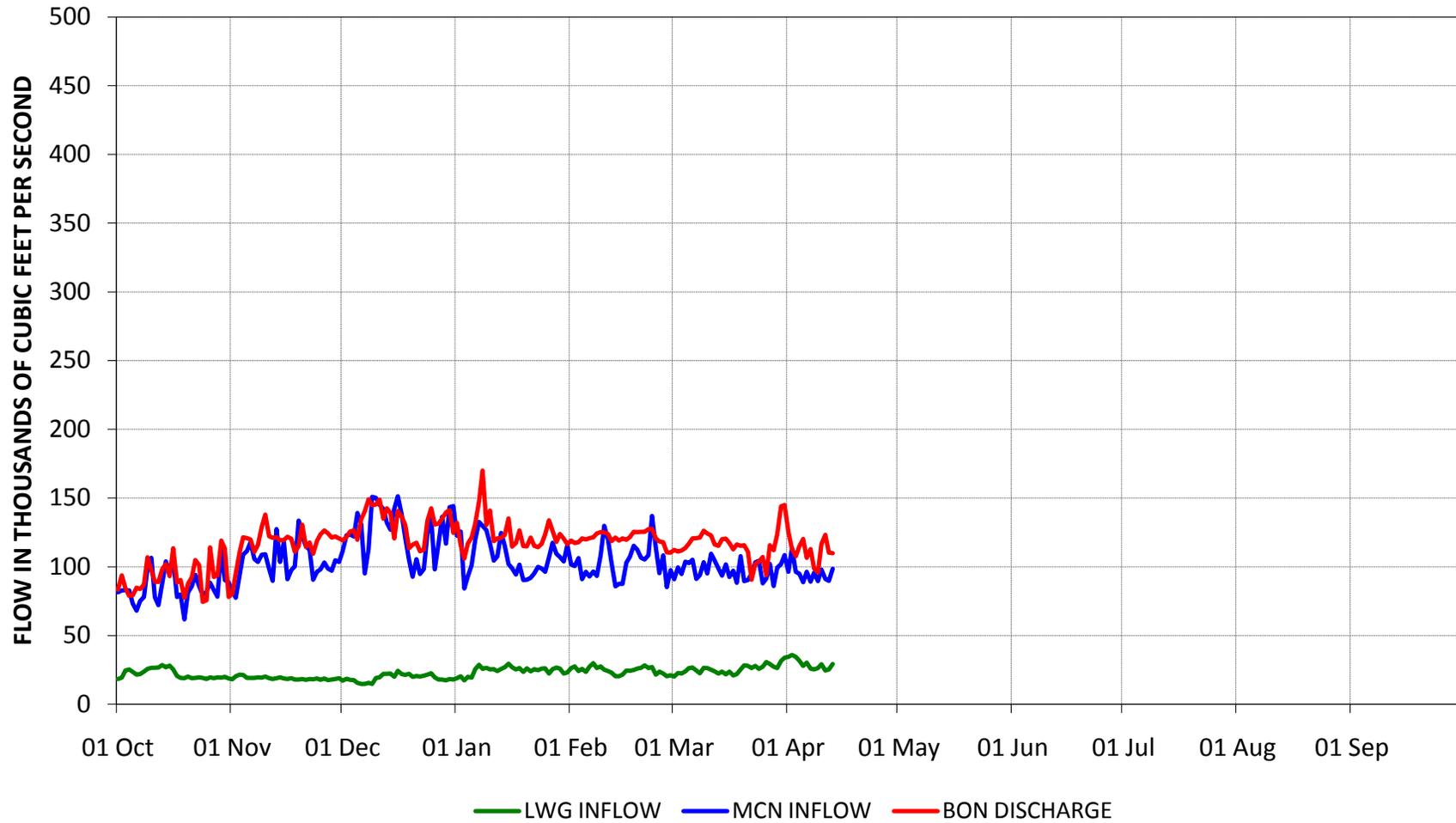
DWORSHAK DAM AND RESERVOIR

Water Year 2010



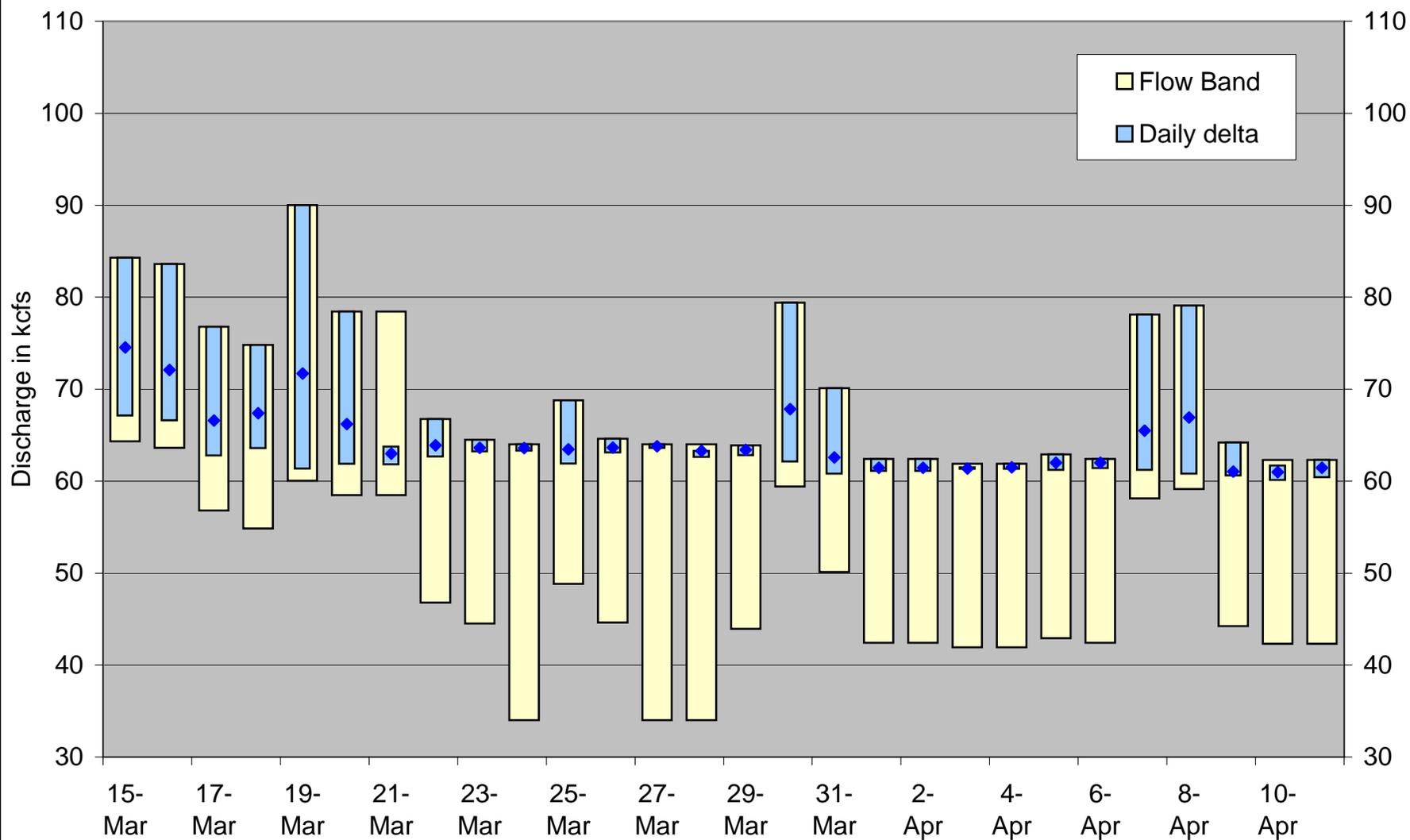
LOWER SNAKE AND LOWER COLUMBIA RIVER FLOWS

Water Year 2010



Priest Rapids Operations 2010

Number of exceedances: 0



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 14, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 April 7, 2010

Dave Wills, USFWS, had a change to the facilitator's notes on page 2 at the end of the first full paragraph; "high level of predation" should be changed to "low level". Russ Kiefer, ID, sent changes to the facilitator's notes which will be incorporated- those notes will then be considered final.

Action/Next Steps: Doug Baus, COE, will post the 4/7 official TMT meeting minutes by Thursday 4/15; edits to those will be reviewed at the next face-to-face TMT meeting on 4/28.

Updated Weather and Flood Control Forecasts

Steve Barton, COE, directed TMT to two maps, both posted as links to the agenda. Link a. detailed Westside SNOTEL data. As of April 12th, the actual precipitation conditions have been slightly higher than predicted, with some areas in the basin at 100-120% of normal. As to the snow pack data, some areas were in the 90-109% of normal range, but the region is still below normal overall. The April final water supply forecast from the River Forecast Center reported 65% of normal for The Dalles (April- August), and 56% of normal for Lower Granite (April-July).

Action/Next Steps: The COE will continue to present updates on this item at upcoming TMT meetings.

Hanford Reach Update

Russell Langshaw, Grant County PUD, directed TMT to a link, posted to the agenda, which included the previous four weeks' operational data. The graph showed that the critical elevation constraint of 20 kcfs has been met easily, with observed minimums of 61 kcfs, maximums of 74.5 kcfs and 64.5 kcfs for the mean daily discharge. The daily delta was between .2-28.7 kcfs, averaging 7.1 kcfs. Langshaw noted that weekend protections will be occurring for the next four weekends, and they will be based on the mean of the minimum flows for the week prior. He added that the season has been accelerated by the winter's mild temperature conditions.

Action/Next Steps: Langshaw will provide an update to TMT at the 4/28 meeting.

2010 Operations

Steve Barton, COE, discussed several issues surrounding 2010 Operations:

Bonneville Spill: Barton reported that since 4/10, inflows at the project have been higher than expected, in the 100-105 range. Spill has not dipped below 62 kcfs and the project has been on minimum discharges; he added that spill is likely to remain in the mid 60's for the foreseeable future.

Libby Operations: Barton said there are a couple of decisions for TMT to make in the near term, and one is regarding whether to wait for the May final forecast to be released before beginning Libby draft operations. He noted that as of 4/13, the Initial Control Flow Date would be 5/7, but the COE re-evaluates the ICF weekly. VarQ operations begin 10 days prior to the ICF date, so based on the ICF date as of 4/13, the COE would begin to release VarQ flows from Libby on 4/28, unless there was consensus at TMT to keep Libby dam at minimum flow until the May final forecast is released on 5/5. He noted that the May final forecast is binding for determining operations for the Sturgeon operation. Barton said that for today's TMT meeting, the COE was seeking all initial thoughts from TMT members and that for the 4/21 TMT call, the COE will need to do an official poll. TMT members provided the following feedback. This initial operation to stay at minimums until the May forecast is issued is called Phase I:

- ID: no concern with waiting until May 5.
- OR: not much concern with waiting until May 5, but need more time to be able to provide the official position statement.
- WA: not much concern with waiting until May 5, but need more time to be able to provide the official position statement.
- USFWS: not much concern with waiting until May 5, but need more time to be able to provide the official position statement.
- NOAA: not much concern with waiting until May 5, but need more time to be able to provide the official position statement.
- BOR: no concern with waiting until May 5.
- BPA: no concern with waiting until May 5.
- CRITFC, Representing Umatilla Tribes: no concern with waiting until May 5.

Barton said that regardless of when the VarQ flows will occur, TMT members will also need to do a poll on Phase II of the spring operation. Joel Fenolio, COE, walked TMT through a presentation that detailed several scenarios and proposed operations for Libby. He acknowledged the fairly large discrepancy between the latest COE and River Forecast Center's water supply forecasts: the RFC was at 4400 KAF and the median ESP was 3300 KAF. Fenolio presented graphs that showed elevation and shaping for April-August water supply levels ranging between 3700 – 5650 KAF. He said that the COE thinks Libby is likely to be in the same position as last year, operating Libby Dam to "Tier 2" requirements while actually being in a "Tier 1" year. He clarified that the cutoff between a Tier 1 and Tier 2 is the May forecast for Libby of 4800 KAF. Jason Flory, USFWS, noted that there is also a spill test planned that will need a forebay elevation of 2415' if a Tier 2 year is declared. TMT members noted concerns for the effects of Libby operations on Grand Coulee operations and also for providing the best flows possible for fish and other system users throughout the spring and summer.

Action/Next Steps:

- TMT members will confer with their agencies internally and the Salmon Managers will discuss the information presented at the FPAC meeting scheduled for 4/20.
- The COE noted that TMT members should refer to the proposed operations on slide 7 and 11 found in link 5-b-i as the illustrations of two comparable options to consider for Phase II.
- TMT members will provide their official statements regarding Libby operations during the TMT call scheduled for 4/21.
- The COE will do outreach to the TMT members not present at today's meeting (MT, Colville Tribes, Shoshonne-Bannock Tribes and the Nez Perce Tribe), so that all TMT members are prepared to participate in the 4/21 call.

Grand Coulee Flow Augmentation: John Roache, BOR, reported that Hanford Reach protection flows are at 60kcfs and he expects a need to increase. Paul Wagner, NOAA, said that this issue was discussed at FPAC and recommended flows of 90kcfs beginning on 4/20.

Action/Next Steps: Action Agencies will begin operations to meet the recommended 90 kcfs on 4/20; however, this could be limited by actual conditions at Grand Coulee. TMT will revisit this issue during the 4/21 call.

Transportation Update

Paul Wagner, NOAA, reminded TMT that the question posed to the ISAB was, "given the low water year, is this a good year to maximize transportation?" Wagner said the recommendation that came back from the ISAB was that 2010 is not a good year for max transportation, and that a "spread the risk" approach would be best. Wagner said the 2010 Fish Operation Plan states that the regional sovereigns are to review the ISAB's recommendation and to consider "when to start transportation" at the technical and policy levels, and that the decision may be made at the policy/RIOG level. Wagner said the issue has been discussed at FPAC and that a request had been made of the Fish Passage Center to help provide technical data that will inform the selection of a transportation start date that would provide as close to a 50/50 transportation/in-river operation as possible.

Margaret Filardo, Fish Passage Center, shared that the FPC is preparing data that they hope to release on Thursday 4/16. TMT members discussed the following technical points of the "when to begin transportation" question:

- Russ Kiefer, ID, suggested - from a technical, biological standpoint, not representative of his agency - that given the forecasted warming temperatures, we will begin to see snow melt which will provide higher flows that could help stimulate outmigration, during the April 20-24th timeframe. He also shared that earlier transport could affect smolt return rates negatively, as they are moved downriver when they are not yet ready for the saltwater environment. If fish are allowed to migrate together because of natural flow increases, it is better for fish.

- Paul Wagner, NOAA, noted that if transportation doesn't begin until May 1, then there is no way to tell how transportation could have benefitted fish if it had begun sooner; therefore, beginning transportation on the earlier side of the April 20-May 1 timeframe would be consistent with the ISAB report. He added that NOAA will look to the data shared by the FPC for guidance in transportation decision-making.
- Tom Lorz, CRITFC, stated that his agency is open to the April 20th- May 1st time frame.
- Charles Morrill, WDFW, said his agency will wait to review the FPC data before taking a position.
- Rick Kruger, OR, stated that he too will reserve his position until the FPC data can be reviewed and added that he appreciates Kiefer's suggestion. He recalled that the NOAA Science Center had reported on the differences observed depending on where fish are tagged, and delays to transportation may impede the analysis/assessment of this year's tagged fish data for those fish tagged further upriver. Traditionally, Oregon supports transportation at any/all collector projects, but for this year, Oregon would not stand in the way of collection on the earlier side of the April 20-May 1 timeframe. Also, one of the factors that improve survival is reducing the number of powerhouse occurrences. He further noted that given the low flow year, the COE might want to consider increasing spill at non-collector projects.

Action/Next Steps: The FPC will post the transportation data findings on their website. Members of RIOG planned to discuss the ISAB report during their 4.16 meeting. This item will be revisited at the next TMT meeting on 4/21.

WMP Spring/Summer Update - Comment Process

Steve Barton, COE, reminded TMT that the comment deadline was April 10th, but noted that the COE has yet to receive any official comments. He said the COE will update the current draft and issue a revised draft by next Friday, 4/23. A one week comment period will be open until 4/30. Barton said 5/7 is the absolute drop dead date for comment submission. Per the BiOp, the final Spring/Summer Update is due no later than May 15th. Per a request from Russ Kiefer, ID, the COE will highlight specifically which operations they are looking for input on from TMT members.

Action/Next Steps: TMT members should send comments on the revised draft to Steve Barton by April 30th and may have an extension to May 7th if they request one.

Operations Review

Reservoirs: Grand Coulee was at elevation 1274.7' with outflows meeting the Hanford Reach protection flows of 60 kcfs and drafting slightly. Hungry Horse was at 3521.27', with 1.5 kcfs outflows. The April water supply forecast for Hungry Horse is 71% of average. Libby was at elevation 2402.66', with 1.5 kcfs inflows and 4.0 kcfs outflows. Albeni Falls was at 2053.7' with inflows of 12.4 kcfs, and outflows of 6.2 kcfs. Dworshak was at elevation 1530.5' with inflows of 4.1 kcfs and outflows of 1.2 kcfs. Steve Hall, COE, noted that the current water supply forecast, assuming outflows of 1.4 kcfs, show a 34% probability of Dworshak meeting refill and the project will likely be 5-15' from full at the end of June. Lower Granite flows were at 29.3 kcfs, McNary flows

were at 98.5 kcfs and Bonneville flows were at 109.9 kcfs. Steve Barton added that the BGS work was not performed as planned due to high winds. Rescheduling the date for the maintenance will be discussed at the next FPOM and TMT members will be informed of the FPOM determination.

Fish Paul Wagner, NOAA, directed TMT to the Fish Passage Center's two week passage index. He reported for juveniles: yearling Chinook were at 1,000 fish per day on the Snake River. Lower Granite passage was at 550 (possible record lows). John Day had passage of less than 100 per day. Bonneville passage was just under 1,000 per day. Sub yearlings at Bonneville were at 129,000 to date. Steelhead numbers at Lower Granite and Bonneville were in the 300 and 200 per day range, respectively. Regarding adult passage, Bonneville reached 3,545 Spring Chinook on 4/10 with 1500 the day after. TMT looked at a graph detailing the 10 year average which showed improvements over the past five years.

Power Tony Norris, BPA, had nothing to report.

Water Quality: Scott English, COE, reported two TDG instances at Camas/Washougal on 4/13 of 115.3%. The causes of the exceedances were unknown at the time but a possible correlation with the B2CC operations is being investigated. He also reported that regarding The Dalles' forebay gauge, it was decided that in order to keep operating, the COE might use pieces of the Warrendale gauge. Also, the COE may put in a temperature monitoring system at Warrendale.

The next TMT meeting will be: a conference call on **4/21 at 9:00 am.**

Agenda items will include:

- Libby Operations
- Transportation Update
- Grand Coulee Flow Augmentation

Future TMT meeting schedule:

4/28 - face to face- COE

5/5 - face to face- COE

5/12 - conference call

5/19 - face to face- COE

5/26 - conference call

**Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES
April 14, 2010**

Notetaker: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of Oregon, Idaho, USFWS, NOAA, COE, BOR, BPA, Washington, CRITFC and others participated. This summary serves as a record of discussion and decisions made, not a verbatim transcript. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes and Facilitator's Notes for April 7

The April 7 official notes had not been posted yet and will be posted soon, Doug Baus (COE) said. There were comments on the April 7 facilitator's notes:

- Dave Wills (USFWS) provided revisions to the first paragraph on page 2: "When many fish are expected to pass the project and predation is expected to be at a low level," replaces, "...high level."
- Russ Kiefer (Idaho) will submit a revision explaining that Idaho supports spilling to 100 kcfs as planned at Bonneville.

3. Updated Weather and Flood Control Forecasts

Precipitation. Barton gave TMT the April final RFC water supply forecasts for April, according to Westside SNOTEL data linked to today's agenda:

- The Dalles Dam – 65% of normal for April-August (60.9 maf)
- Lower Granite Dam – 56% of normal for April-July (12 maf)

As of April 12, precipitation has been running 100-120% of normal basin-wide according to RFC data. The forecast is fairly stable, and precipitation is the main driver of volatility in water supply forecasts. Barton gave TMT the latest precipitation data for April:

- Snake River above Ice Harbor – 119% of normal
- Columbia River above The Dalles – 124% of normal
- Clark Fork of the Snake River – 70% of normal
- Flathead River basin – 61% of normal

Snow Pack. Barton noted a statistical caveat regarding the readings shown in the second link to this item on today's agenda. On an average climate basis, these locations normally would have peaked in accumulation and be

trending downward. This year, the peaks are converging on normal readings for this time of year. The point is that water conditions are below normal throughout most of the basin (60-70% of normal in western Montana). The only areas near normal are low-elevation areas in Washington and to the south.

Link 3b depicts RFC data including Canada, where the water supply is around 70-85% of normal except in the far north. The Canadian portion of the basin has around 80% of normal water supply. The final water supply forecast for April has been incorporated into these RFC data.

4. Hanford Reach Update

Russell Langshaw (Grant PUD) gave an update on Hanford Reach protection flows over the past 4 weeks. The graph linked to this item depicts 4 weeks of operations at Priest Rapids Dam. The operation is still bumping up against critical elevation constraints, which have been around 20 kcfs. Mean daily discharges have ranged from 61 to 74 kcfs, with an average of 64.5 kcfs. Daily deltas have ranged from 0.2 to 28.7 kcfs, with an average of 7.1 kcfs.

Warmer water temperatures this winter have accelerated the protection program. Weekend protection flows are scheduled to begin this weekend and continue for the next 4 weekends. The minimum constraint for weekend operations will be the mean of minimum flows for the previous Monday through Thursday. With flows so low, that isn't expected to be a problem. Langshaw will give TMT another update at the April 21 meeting.

5. 2010 Operations

a. Bonneville Spill Plan. Barton reported on Bonneville operations since spill began April 10. Discharges have been 100 kcfs or more, thanks to higher inflows into the lower Columbia than predicted at last week's TMT meeting according to STP projections. Spill levels have remained stable in the range of 60 kcfs or slightly higher with the project at minimum generation. Total discharges are around 110 kcfs, which is expected to continue for the foreseeable future.

Russ Kiefer (Idaho) and Charles Morrill (Washington) thanked the Action Agencies for providing the best possible operation in response to SOR-2010-01, presented at last week's TMT meeting. The COE will post documentation on disposition of that SOR to the TMT website in the next few days.

Barton noted that high winds made it impossible to close the B2CC and complete BGS repairs which had been planned to coincide with the powerhouse outage. So FPOM is working on rescheduling the repairs, which could have spill implications. The COE will seek recommendations from FPAC and TMT when the work schedule becomes more definite.

b. COE Proposal for Libby Spring Operations. Libby Dam is required to begin refill VARQ operations for flood control 10 days prior to the predicted date

of initial controlled flow, Barton reminded TMT. The project also must release a sturgeon pulse if the COE final inflow forecast for May is 4,800 kaf or more. Given the unusually dry conditions this spring, COE presented TMT with several complex choices and upcoming decisions regarding Libby operations.

Joel Fenolio (COE) presented two links to this topic on the agenda, a series of water supply forecast graphs, and an outline of the COE proposal for Libby operations. The final COE May forecast to be released on May 5 will determine VARQ and bull trout discharges. When the natural hydrograph crosses the ICF value (200 kcfs on May 7, as of yesterday), that triggers VARQ and bull trout discharges starting April 28 under the default Libby operation. The actual ICF date won't be known until after the fact.

A large discrepancy between the latest COE and RFC forecasts for April 2010 (5,100 and 4,400 kaf, respectively) creates high volatility in this year's May forecast and Libby operations. Fenolio foresaw a situation like last year when the May final forecast called for a Tier 2 year operation requiring bull trout flows. However, actual inflows to Libby Dam were lower, amounting to a Tier 1 year. (The 2009 forecast was 5,200 kaf vs. an actual inflow volume of 4,300 kaf.)

The purpose of the COE proposal is to smooth out the effects of an expected drop in the volume forecast on 2010 releases from Libby Dam. By operating the project at minimum flows instead of VARQ in May, the proposal would create storage at Libby that otherwise would not occur. The stored excess would either be released by the end of May, making it flow-neutral for summer, or by the end of August. Barton emphasized that today's discussion is very preliminary, and the COE wasn't asking for binding recommendations on the proposal until next week. Fenolio explained phase 1 and phase 2 of the proposal, depicted in links to today's agenda.

Phase 1: This phase covers the beginning of refill operations. The project would hold minimum discharges of 4 kcfs after the start of refill (now projected to occur between April 28 and May 1) until the May water supply forecast is issued on May 5. The difference in volume between minimum flows and VARQ flows would be held in the reservoir until it becomes clear whether this is a Tier 1 or Tier 2 year requiring a sturgeon pulse. In either case, the stored excess would be released by May 31. If it's a Tier 2 year, the project would operate at minimum flows for refill. If it's a Tier 1 year, the project would operate to VARQ flows for refill. Two graphs linked to today's agenda compare projected 2010 Libby operations in a Tier 1 and Tier 2 year, both with an assumed actual inflow volume of 4,400 kaf based on ESP traces. The main difference is inclusion of a sturgeon volume. The cutoff point for a Tier 2 designation is a final May forecast of 4,800 kaf or more. Under phase 1 of the proposal, Libby reservoir elevation would be 2,415 feet on May 31 whether it's a Tier 1 or Tier 2 year.

Consensus is required to implement the COE proposal because it deviates from the Fish Operations Plan. If the Salmon Managers reach consensus in favor of phase 1, Libby would release 7,700 kaf in May instead of

7,000 kaf if it's a Tier 1 year with no sturgeon volume. The VARQ flows would be around 7 kcfs. If it's a Tier 2 year which seems likely, the project would pass inflows until May 18, then VARQ flows of around 10 kcfs. Essentially the project would pass inflows until they exceed VARQ, putting the reservoir at a projected elevation of 2,415 feet by the end of May – the cutoff point for spill at Libby. The Tier 2 scenario includes a sturgeon volume of 800 maf. After the sturgeon pulse ends, the project would go to minimum flows.

TMT members (Montana was not present) gave the COE some initial feedback on Phase 1:

- **USFWS** – Fully supports the idea because it increases the likelihood of reaching the required elevation to conduct a spill test of the sturgeon pulse. The spill test is part of a negotiated settlement to the BiOp litigation (see discussion of Phase 2 below). Implementing the proposal is an important first step in setting up a successful bull trout operation this year.
- **Idaho** – Supports phase 1 of the proposal.
- **Oregon** – Neutral at this point. Focused on what would happen in the lower river after May.
- **Washington** – Echoed Oregon's neutrality. Phase 1 appears to make sense.
- **NOAA** – Supports the idea.
- **BOR** – The operation sounds reasonable.
- **BPA** – This simple adjustment in light of current conditions makes sense.
- **CRITFC** – It's too early to say.

TMT members will give their official recommendations on Phase 1 of the COE proposal next week. Meanwhile, the COE will solicit Montana's view of it.

Phase 2: This involves two alternatives – a flow-neutral strategy with excess volume released by the end of June, and a summer flow augmentation strategy – under low, medium and high inflow scenarios for April-August.

Alternative #1 (shown on page 7 of the water supply forecast link) is a flow-neutral scenario that releases an excess stored volume of approximately 240 kaf before June 30 around the sturgeon pulse. This operation would raise the reservoir elevation to 2,415 feet (required for spill of 5 kcfs) around May 31 if inflows don't flatten; timing would be essential to its success. Elevation 2420 feet in Libby reservoir would allow 10 kcfs spill for the test. Alternative 1 targets an August 31 elevation of 2,443 feet in Libby reservoir.

If 2010 is a Tier 2 year as anticipated, the project would release about 4 kcfs through May 14 under alternative 1, then the bull trout minimum of 6 kcfs from May 15-31. VARQ flows would be 10 kcfs. Releasing only minimum flows through May 14 would raise the reservoir elevation by 6 feet on May 31 over the VARQ operation, providing an additional 10 kcfs for the sturgeon spill test. The spillway crest elevation is 2,405 feet. At elevation 2,415 feet, the reservoir would

have sufficient volume for spillway releases of 5 kcfs. At elevation 2,420 feet, the full 10 kcfs would be available for the spill test as written into the settlement agreement. Alternative 1 essentially merges VARQ flows with the sturgeon pulse. Timing is essential to success of this strategy.

Margaret Filardo (FPC) suggested including the predicted shapes of flows in the lower river in the graphs depicting this alternative. Oregon and Idaho asked for confirmation from the COE that flow objectives wouldn't change under this scenario. The COE will report back to TMT on that.

Inflow volumes under the low, medium and high inflow scenarios of alternative 1 are 4,400 kaf, 2,028 kaf, and 5,400 kaf, respectively. The low inflow scenario projects a volume of 214 kaf to be released between the start of refill and June 30, with a reservoir elevation of 2,411 feet on June 30 under the VARQ scenario. Under the low-flow scenario, this alternative wouldn't allow sufficient volume for spill. Dropping to minimum flows in May would yield a reservoir elevation of 2,415 feet on June 30, or 5 kcfs spill. The medium inflow scenario in a Tier 2 year would yield a volume of 5,028 kaf with 5 kcfs spill under VARQ and 10 kcfs spill under bull trout minimums starting June 10. The high inflow scenario would allow enough flexibility to release the stored volume by June 30.

Alternative 2 (shown on page 11 of the water supply forecast link) is a maximum refill operation that targets elevation 2,443 feet by end August, then 2,439 feet by end September, whether VARQ flows or bull trout minimum flows are released in May. The sturgeon pulse would start June 1. Under the high inflow scenario, this option would yield higher summer elevations than alternative 1, as well as sustained outflows after the sturgeon pulse ends. The low inflow scenario (most likely) offers a chance of providing volume for the spill test if the project drops to minimum flows. However, operating to VARQ flows under the low scenario would yield a May 31 elevation of 2,411 feet, which is insufficient for spill. Timing will be crucial, Barton said. It may be impossible this year to achieve the required spillway crest elevation for the sturgeon spill test, whether or not one of these alternatives is implemented.

To summarize, TMT was asked to consider two questions for final polling next week: (1) Is there consensus on going to bull trout minimums in May to increase the likelihood of a spill test this summer? (2) Is there consensus on either a flow-neutral operation by June 30 or a flow-augmentation operation this summer? The Salmon Managers gave the COE some preliminary feedback on the Phase 2 alternatives:

- **USFWS** – The deviation from the FOP depicted in Phase 2 is consistent with the BiOp settlement agreement which says the Action Agencies will operate the system to provide a spill test for sturgeon in June. An elevation of 2,415 feet in Libby reservoir is one component of the conditions needed for the spill test.
- **NOAA** – Concerned about whether pushing Libby volume from May into June would put unacceptable stress on Grand Coulee operations.

- **Oregon** – Concerned about the effects on lower river operations. It appears the difference between the two alternatives would amount to 2-3 kcfs volume passing through Grand Coulee by the end of June.

TMT will revisit Libby operations during its April 21 conference call.

c. Grand Coulee Flow Augmentation. Currently Grand Coulee is operating to provide Hanford protection flows of 60 kcfs at Priest Rapids Dam. But we are expecting a need to increase the objective with the spring fish migration starting, John Roache said. Paul Wagner said the issue was discussed at FPAC and recommended a 90 kcfs flow objective at Priest Rapids Dam beginning April 20.. At current inflows, that would mean drafting Coulee by slightly less than a foot per day. The increased flows would support upper and mid Columbia hatchery releases, Wagner said, as well as wild steelhead and spring Chinook at Rock Island Dam. It's possible that a flow objective of 90 kcfs could be hindered by draft limits at Grand Coulee, Barton and Norris agreed. Grand Coulee reservoir is projected to reach elevation 1,264 feet by the end of April. TMT will revisit the flow augmentation proposal in its conference call next week.

6. Transportation Update

Asked whether it would be advisable to maximize transport this year in light of the near-drought conditions, the ISAB response was no, some spill should be provided, Wagner said. The ISAB report says more information is needed on the comparative effects of spill and transport in a low-flow year such as this one.

The question facing TMT and RIOG is when transport should begin. FPC is researching this question and anticipates reporting its findings by April 15 in a report posted to its web page.

Default mode is to start transporting on April 20 at all projects in years of less than 70 kcfs, such as this one. Other options in the 2010 FOP include beginning transport no later than May 1 at Lower Granite, stopping spill at the same time. If transportation starts too late, it would result in a lack of comparative information on how transported vs in-river populations fared. NOAA research on this to date is limited by lack of early migrants. Dan Feil (COE) added that any comparison of 2010 to 2007 as another low-flow year should take into account the lack of surface passage structures at Lower Monumental and Little Goose in 2007.

The Salmon Managers shared their initial views of transport in 2010:

- **Idaho** – No official position yet. Kiefer's technical recommendation is to allow the early peak of migrants to travel in-river, then start transporting after the first wave of migrants but before May 1.
- **CRITFC** – No position yet.
- **Washington** – No position yet.

- **Oregon** – Doesn't oppose starting transport later than April 20 this year. Under such low flow conditions, the Action Agencies should definitely consider providing spill, per the BiOp protocol for dry years. Increased spill at the non-collector projects might improve river conditions and aid migration. Reducing the number of powerhouse passages tends to improve survival rates.

7. WMP Spring/Summer Update Comments Due April 10

The COE has yet to receive any comments on its preliminary draft of the Water Management Plan spring/summer update, Barton reported. The COE will update the draft in light of new information and reissue it on April 23, with a revised comment deadline of April 30 instead of May 7 as initially planned. There's some flexibility in the April 30 deadline if needed, but the final deadline of May 15 is established under the BiOp.

8. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,274.7 feet, releasing flows to meet the 60 kcfs for Hanford Reach protection flows. Hungry Horse is at elevation 3,521.27 feet, with discharges of 1.5 kcfs. Libby is at elevation 2,402.66 feet, with inflows of 1.5 kcfs and outflows of 1.2 kcfs.

Albeni Falls is at elevation 2,053.7 feet, with 12.4 kcfs inflows and 6.1 kcfs outflows. Dworshak is at elevation 1,530.5 feet, with 4.1 kcfs inflows and 1.2 kcfs outflows.

Lower Granite inflows are 29.3 kcfs; McNary inflows are 98.5 kcfs; and Bonneville inflows are 109.9 kcfs.

b. Fish. Juveniles: Passage numbers at the Salmon River trap have remained around 1,000 fish per day for the past few weeks. There was a peak of 9,000 per day at the Imnaha trap, now at 5,000 per day. Lower Granite is now passing 550 yearling Chinook per day, with the migration still delayed by low flows. John Day is passing 100 fish per day, and Bonneville just under 1,000 fish per day. Subyearlings are passing Bonneville at the rate of 129,000 per day due to the recent Spring Creek Hatchery release. The project is spilling, so they're not passing through the powerhouse. The steelhead subyearling migration is lagging behind Chinook, with a peak so far of 300 fish per day at Lower Granite and 200 fish per day at Bonneville.

Adults: The good news is they're passing in the thousands at Bonneville, with a peak of 3,545 fish on April 10 when spill started. This represents an improvement over passage in the past 5 years and is closer to the 10-year record for passage by this date.

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

d. Water Quality. There have been two borderline exceedances this week, one yesterday at Camas Washougal gage. These may correlate to operation of the B2CC for kelts; the COE is investigating a connection. The Dalles forebay gage has been operating intermittently and the COE is pursuing a temporary fix.

9. Next Meeting

The next TMT meeting will be a conference call on April 21, with Libby operations and the initiation of transport as the two main topics on the agenda. TMT will meet next in person on April 28 at the COE NW division office.

<i>Name</i>	<i>Affiliation</i>
Rick Kruger	Oregon
Russ Kiefer	Idaho
David Wills	USFWS
Paul Wagner	NOAA
Doug Baus	COE
John Roache	BOR
Tony Norris	BPA
Steve Barton	COE
Rob Allerman	Deutsch Bank
Rob Dies	Iberdrola Renewables
Joel Fenolio	COE
Kim Johnson	COE
Mark Fisher	EDF Trading
Tim Heizenrader	Centaurus
Bill Proctor	COE
Karl Kanbergs	COE
Scott English	COE
Dan Feil	COE
Charles Morrill	WDFW
Tom Lorz	CRITFC

Phone:

Scott Bettin	BPA
Jason Flory	USFWS Spokane
Greg Bowers	COE
Steve Hall	COE Walla Walla
Margaret Filardo	FPC
Russ George	WMC
Glen Trager	Shell Energy
John Hart	EWEB
Richelle Beck	DRA
Greg XX	Endure Energy
Tom Le	Puget Sound Energy
Don Faulkner	COE

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Wednesday April 21, 2010 09:00 - 11:00

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for April 7 and 14, 2010 [[Meeting Minutes](#)]
3. Libby Spring Operations - Steve Barton, COE-RCC
 - a. [Projections with STP](#)
 - b. [Operations](#)
 - c. [Follow-up Modeling Results](#)
4. Transportation Update - Steve Barton, COE-RCC
5. Other
 - a. Set agenda and date for next meeting - **April 28, 2010**
 - b. [[Calendar 2010](#)]

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

Table 1. Summary of Kootenay Lake Modeled May 1 through June 30 Releases (average kcfs).

Modeled Mean value and Non-Exceedance Frequency Summary.

Results based on April 6th ESP streamflow forecasts.

	Base Alternative: VarQ Operation	Alternative 1: Flow-Neutral Operation	Alternative 2: Refill Operation
Mean	41.9	40.8	40.2
25th-% (Non-Exceedance)	38.0	37.4	36.7
50th-% (Non-Exceedance)	41.4	40.9	40.4
75th-% (Non-Exceedance)	45.2	43.9	43.4

Table 2. Grand Coulee May 31st Modeled Reservoir Elevations.

Modeled Minimum / Mean Value and Non-Exceedance Frequency Summary.

Results based on April 6th ESP streamflow forecasts.

	Base Scenario: VarQ Operation	Alternative 1: Flow-Neutral Operation	Alternative 2: Refill Operation
Minimum	1226.0	1226.0	1226.0
Mean	1259.0	1257.8	1257.8
25th-% (Non-Exceedance)	1250.9	1249.6	1249.6
50th-% (Non-Exceedance)	1257.7	1255.6	1255.6
75th-% (Non-Exceedance)	1266.3	1264.6	1264.6

Table 3. Summary of Alternative Comparisons for Grand Coulee May 31st Reservoir Elevation.

Modeled Mean Difference and Non-Exceedance Summary.

Results based on April 6th ESP streamflow forecasts.

	Base Scenario Minus Alternative 1	Base Scenario Minus Alternative 2	Alternative 1 Minus Alternative 2
Mean	1.23	1.23	0.00
25th-% (Non-Exceedance)	0.79	0.79	0.00
50th-% (Non-Exceedance)	1.28	1.28	0.00
75th-% (Non-Exceedance)	1.88	1.88	0.00

Table 4. Summary of Grand Coulee Modeled May 1 through June 30 Releases (average kcfs).

Modeled Mean value and Non-Exceedance Summary.

Results based on April 6th ESP streamflow forecasts.

	Base Alternative: VarQ Operation	Alternative 1: Flow-Neutral Operation	Alternative 2: Refill Operation
Mean	105.4	104.5	103.9
25th-% (Non-Exceedance)	95.9	94.4	93.9
50th-% (Non-Exceedance)	104.2	103.7	103.4
75th-% (Non-Exceedance)	113.9	112.8	112.2

Table 5. Summary of Grand Coulee Modeled July 1 through August 31 Releases (average kcfs).

Modeled Mean value and Non-Exceedance Summary.

Results based on April 6th ESP streamflow forecasts.

	Base Alternative: VarQ Operation	Alternative 1: Flow-Neutral Operation	Alternative 2: Refill Operation
Mean	85.6	86.6	86.0
25th-% (Non-Exceedance)	80.2	82.2	81.4
50th-% (Non-Exceedance)	85.8	86.7	86.0
75th-% (Non-Exceedance)	89.8	91.1	90.0

Table 6. Summary of McNary Modeled May 1 through June 30 Releases (average kcfs).

Modeled Mean value and Non-Exceedance Summary.

Results based on April 6th ESP streamflow forecasts.

	Base Alternative: VarQ Operation	Alternative 1: Flow-Neutral Operation	Alternative 2: Refill Operation
Mean	187.3	186.3	185.9
25th-% (Non-Exceedance)	171.6	170.9	170.4
50th-% (Non-Exceedance)	186.9	184.4	184.7
75th-% (Non-Exceedance)	200.5	200.8	199.1

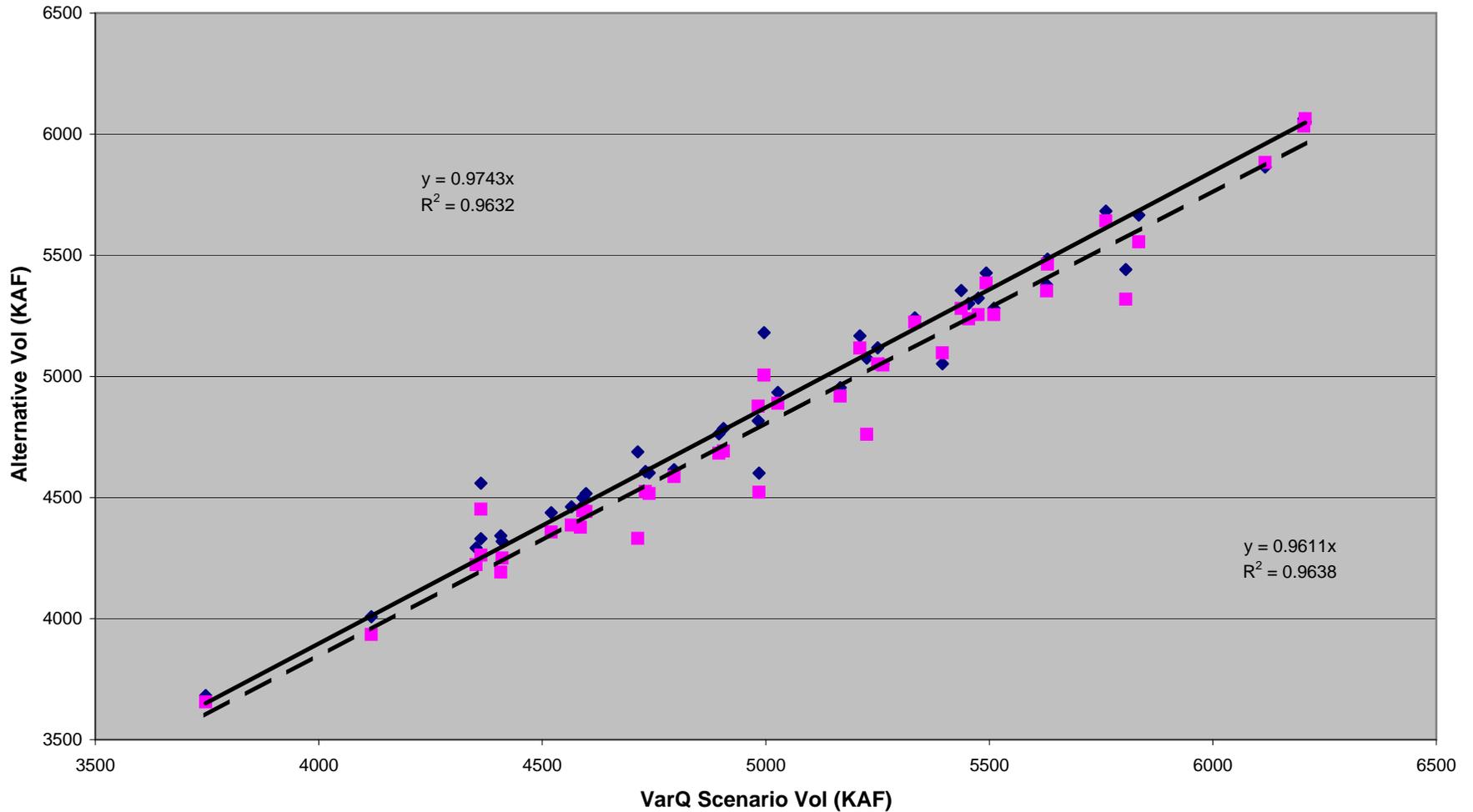
Table 7. Summary of McNary Modeled July 1 through August 31 Releases (average kcfs).

Modeled Mean value and Non-Exceedance Summary.

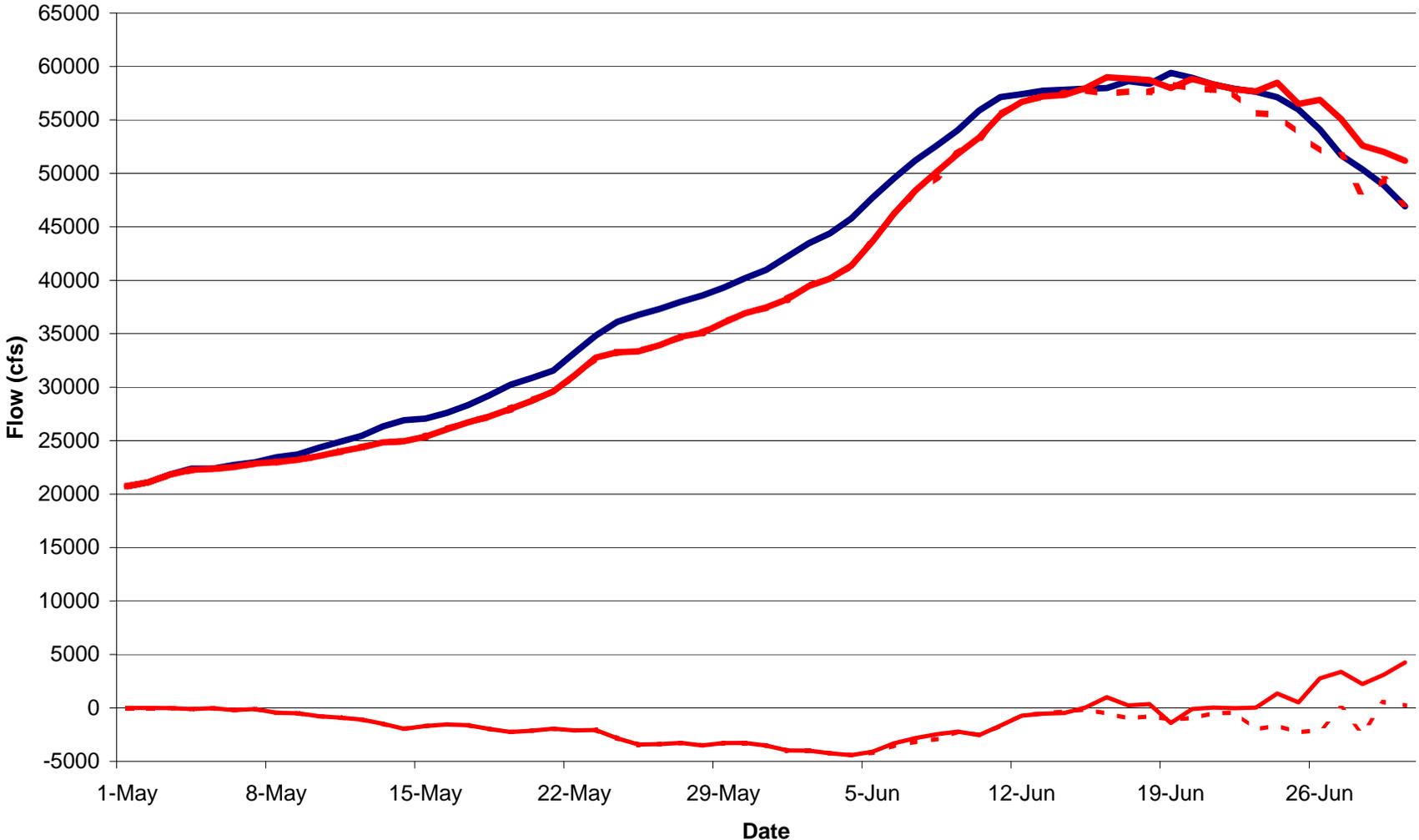
Results based on April 6th ESP streamflow forecasts.

	Base Alternative: VarQ Operation	Alternative 1: Flow-Neutral Operation	Alternative 2: Refill Operation
Mean	125.9	126.9	126.3
25th-% (Non-Exceedance)	120.7	119.6	120.4
50th-% (Non-Exceedance)	124.9	125.6	124.7
75th-% (Non-Exceedance)	130.6	131.8	131.3

Corra Linn Volume Releases



Daily 50th Percentile Flows and Differences from VarQ



VarQ Alt 1 Alt 2 Diff Alt 1 - VARQ Diff Alt 2 - VARQ

Brief Background

- Seattle District is requesting a deviation request to go to minimums through the month of May 2010. This request would benefit:
 - Libby release operations between the months of April and May
 - Increase the probability of providing for the spill test as specified in the 2006 USFWS as clarified
 - Benefit recreational interests on the reservoir as well as power needs during the summer
- The plan is being presented in 2 phases and phase II has 2 alternatives, discussed later in the presentation

Questions to TMT

- Can we get consensus on Phase I?
- If yes, can we get consensus on reducing the VarQ flows in May to minimums (Phase II)?
- If yes, which alternative of Phase II can we get consensus?

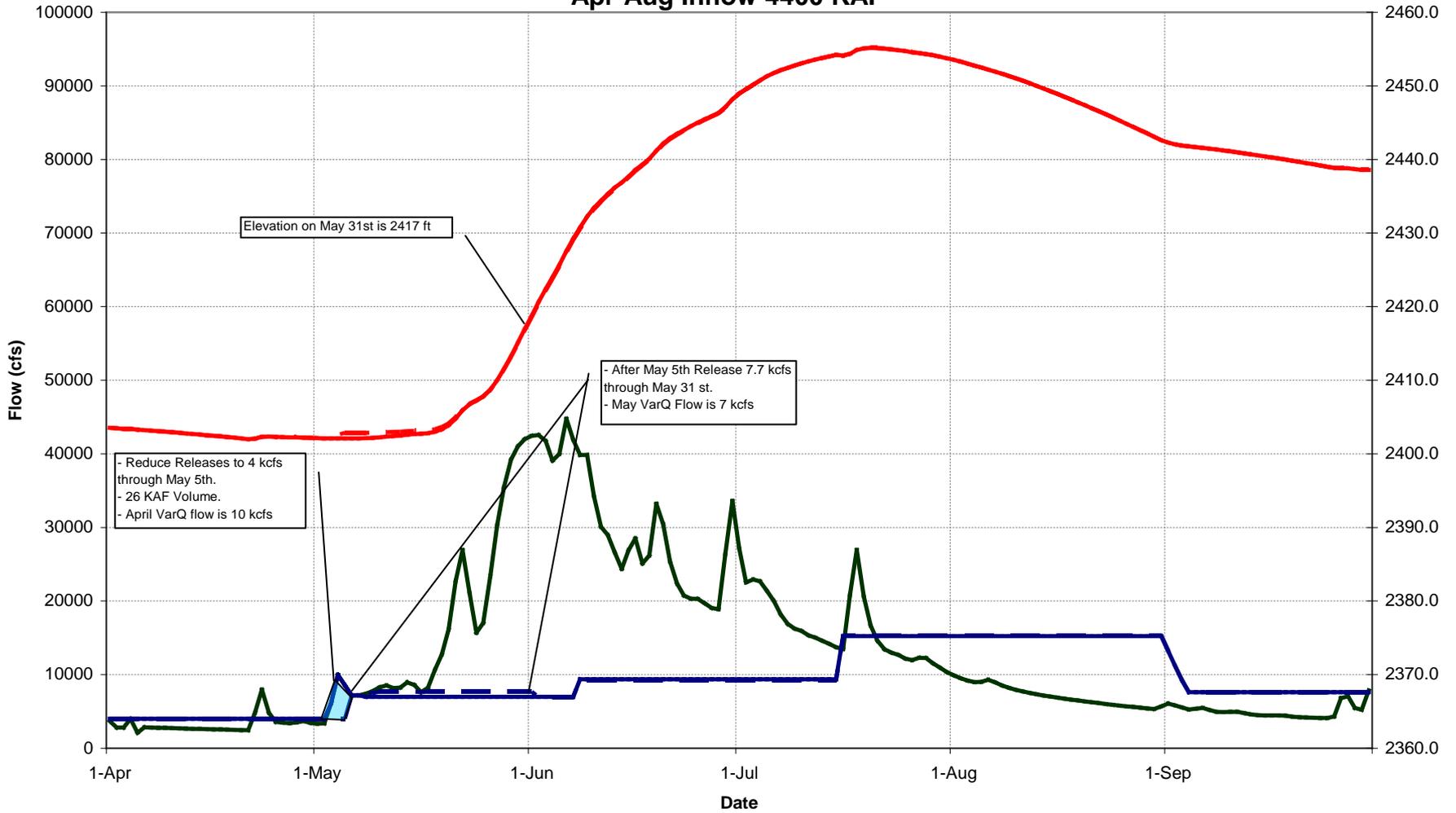
Phase I

- Hold minimum flows after start of refill (projected May 1st) until the May Water Supply Forecast (WSF) is issued.
 - In Tier 1 or 2 year get the volume out by May 31st.
- See Phase I graphs

Libby Dam and Reservoir

Water Year 2010 - Tier 1

Apr-Aug Inflow 4400 KAF

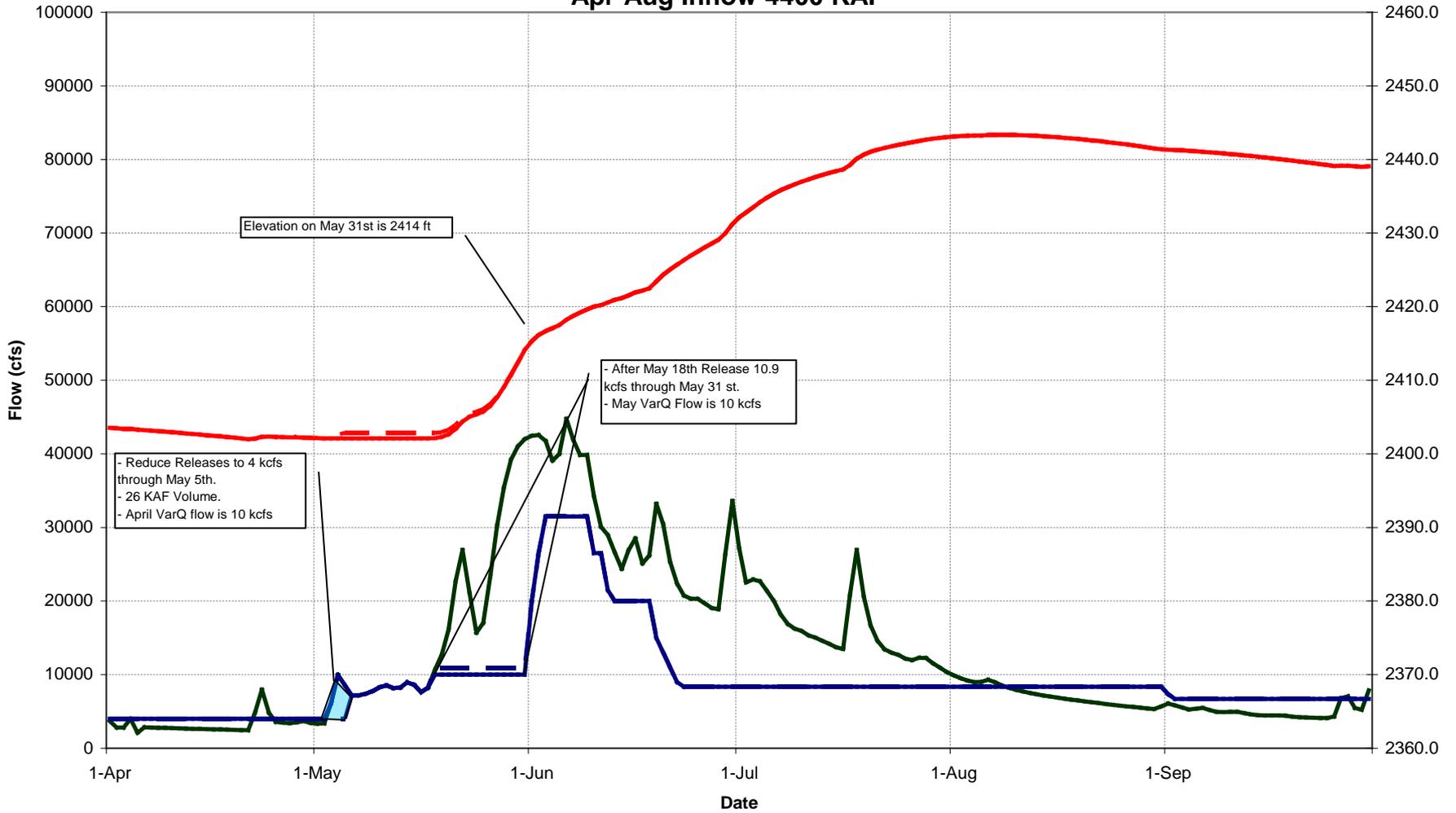


— Inflow
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 — Elevation Deviation

Libby Dam and Reservoir

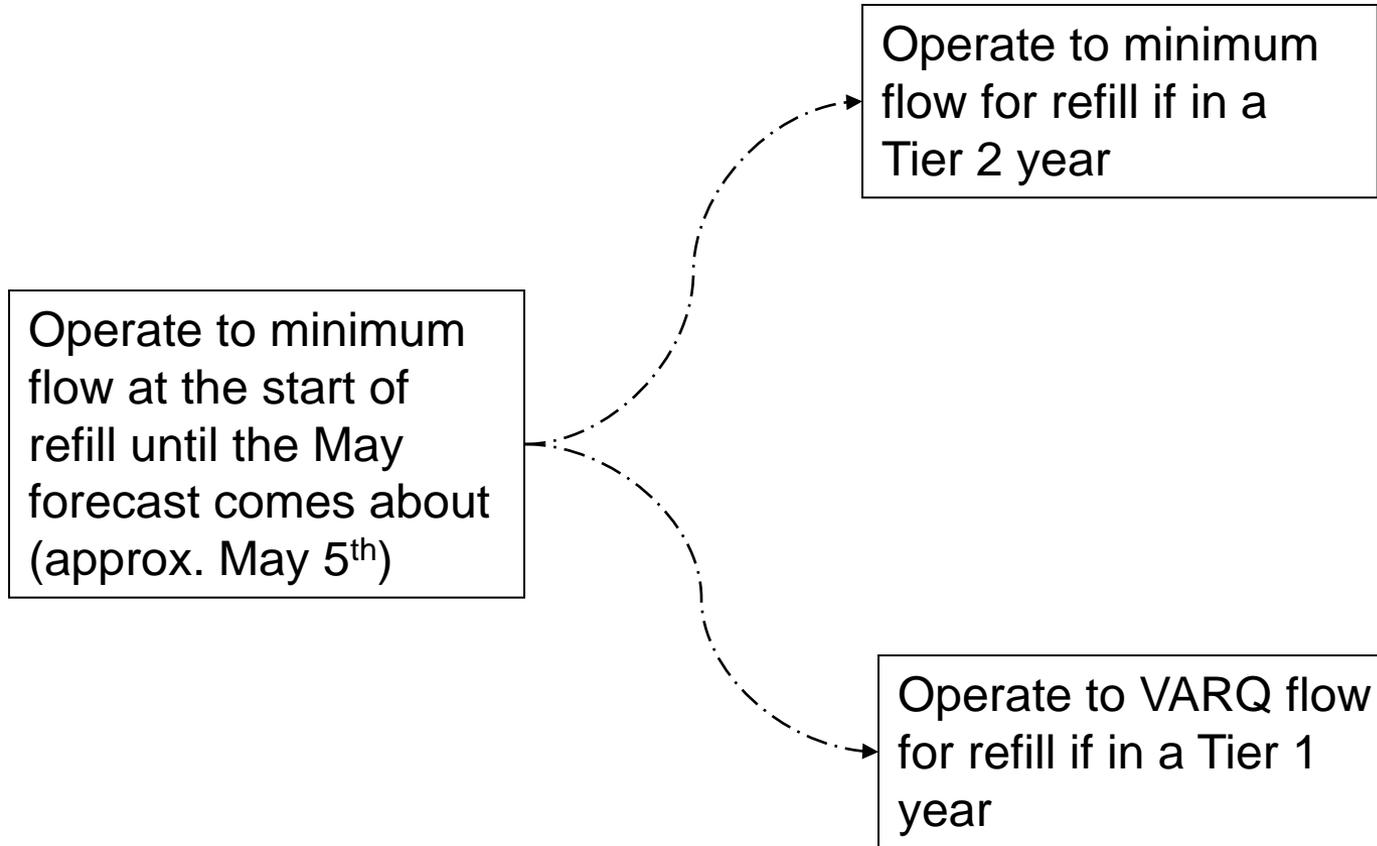
Water Year 2010 - Tier 2

Apr-Aug Inflow 4400 KAF



— Inflow
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 - - Elevation Deviation

Libby Operations – WY 2010 Decision Points



Phase II

- Tier 2 year declared by WSF being between 4800 – 5400 KAF.
 - Hold 4 kcfs through May 14th then increase to 6 kcfs on May 15th until the Sturgeon Operation starts
 - Increases the chance to spill Libby Dam as part of the settlement agreement
- Alt 1: is to take the volume difference in May and release that same volume around the pulse
 - Flow Neutral
- Alt 2: is to target a flow to reach 2443 ft Aug 31st and then 2439 ft end of Sept.

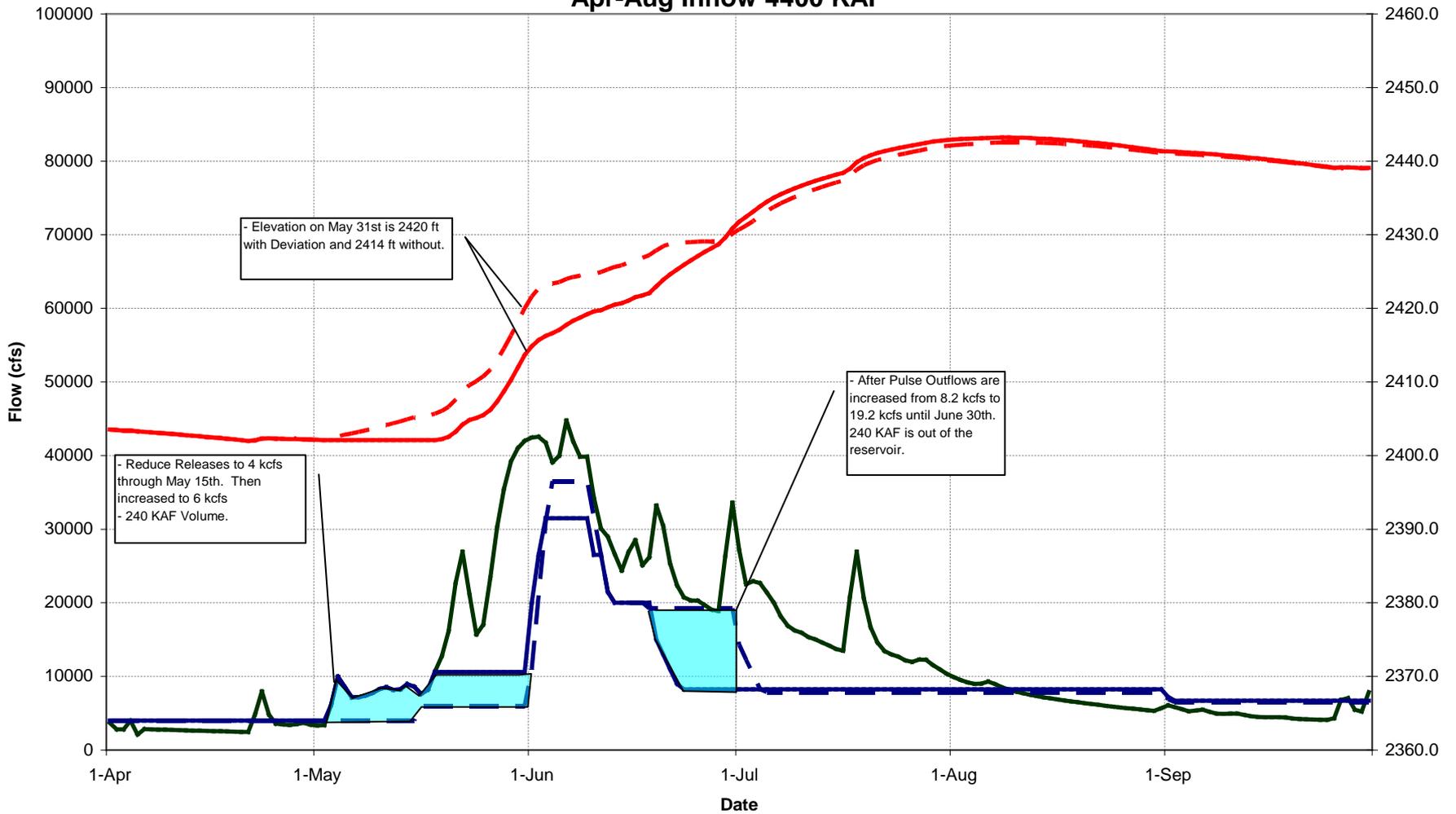
Alt 1: Flow Neutral

- Start of Refill is May 1st
- June 1st start of pulse
 - Sturgeon operations started June 10th last year
- Hydrographs are actual ESP traces
- Libby Dam can spill 5 kcfs if at elevation 2415 ft and 10 kcfs at elevation 2420 ft.
- After June 30th target 2443 ft 31 Aug

Libby Dam and Reservoir

Water Year 2010 - Tier 2

Apr-Aug Inflow 4400 KAF

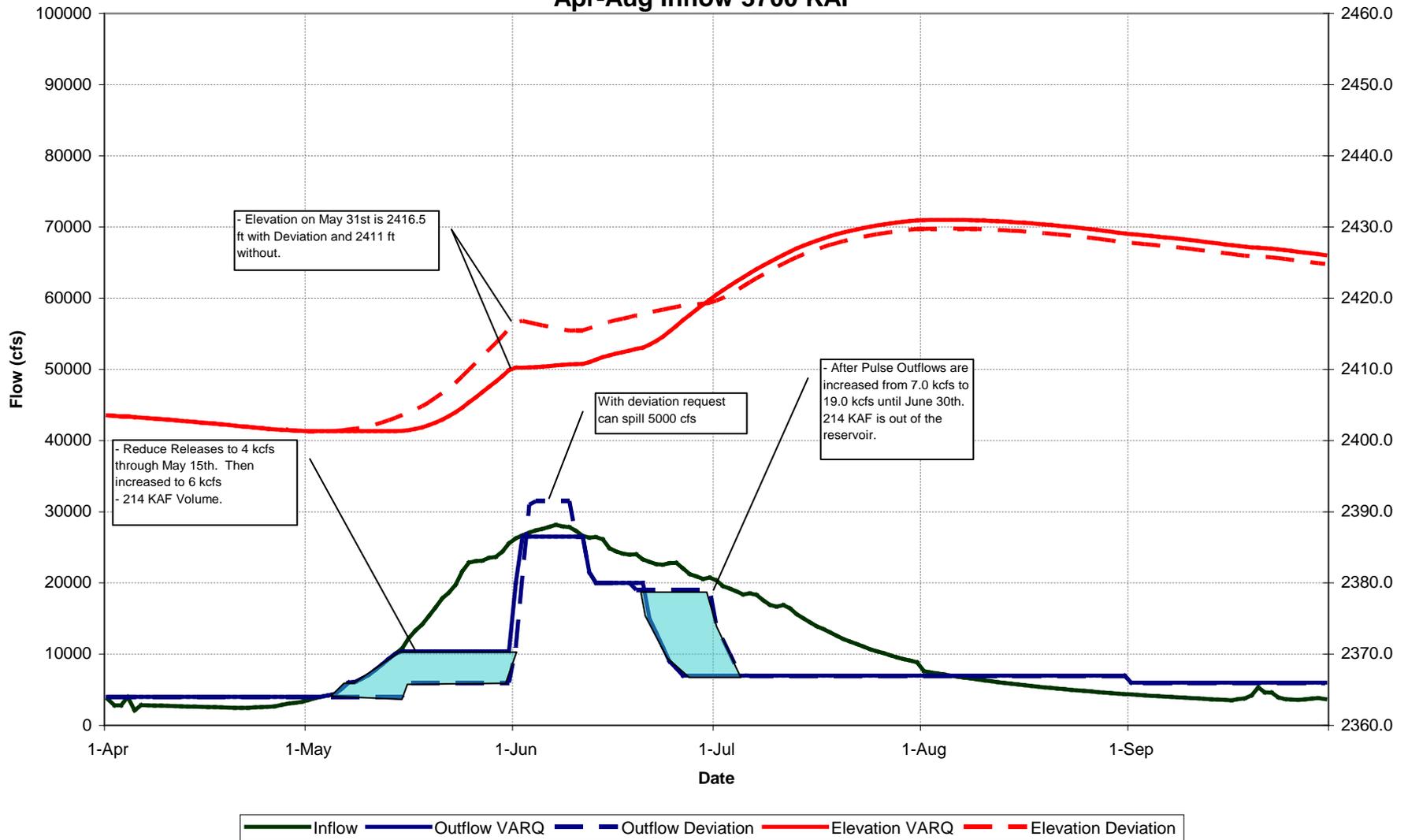


— Inflow
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir

Water Year 2010 - Tier 2 STP

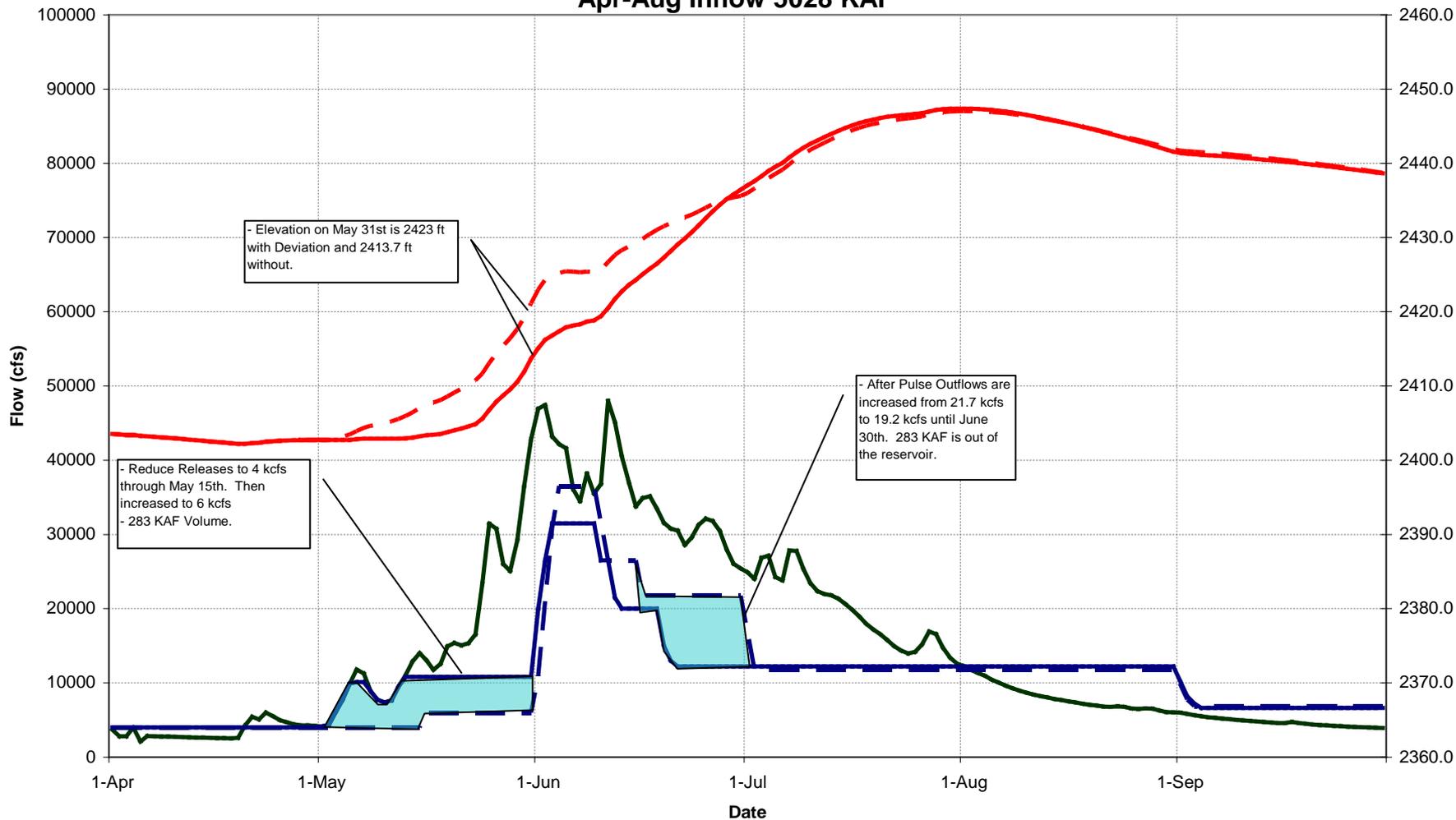
Apr-Aug Inflow 3700 KAF



Libby Dam and Reservoir

Water Year 2010 - Tier 2

Apr-Aug Inflow 5028 KAF

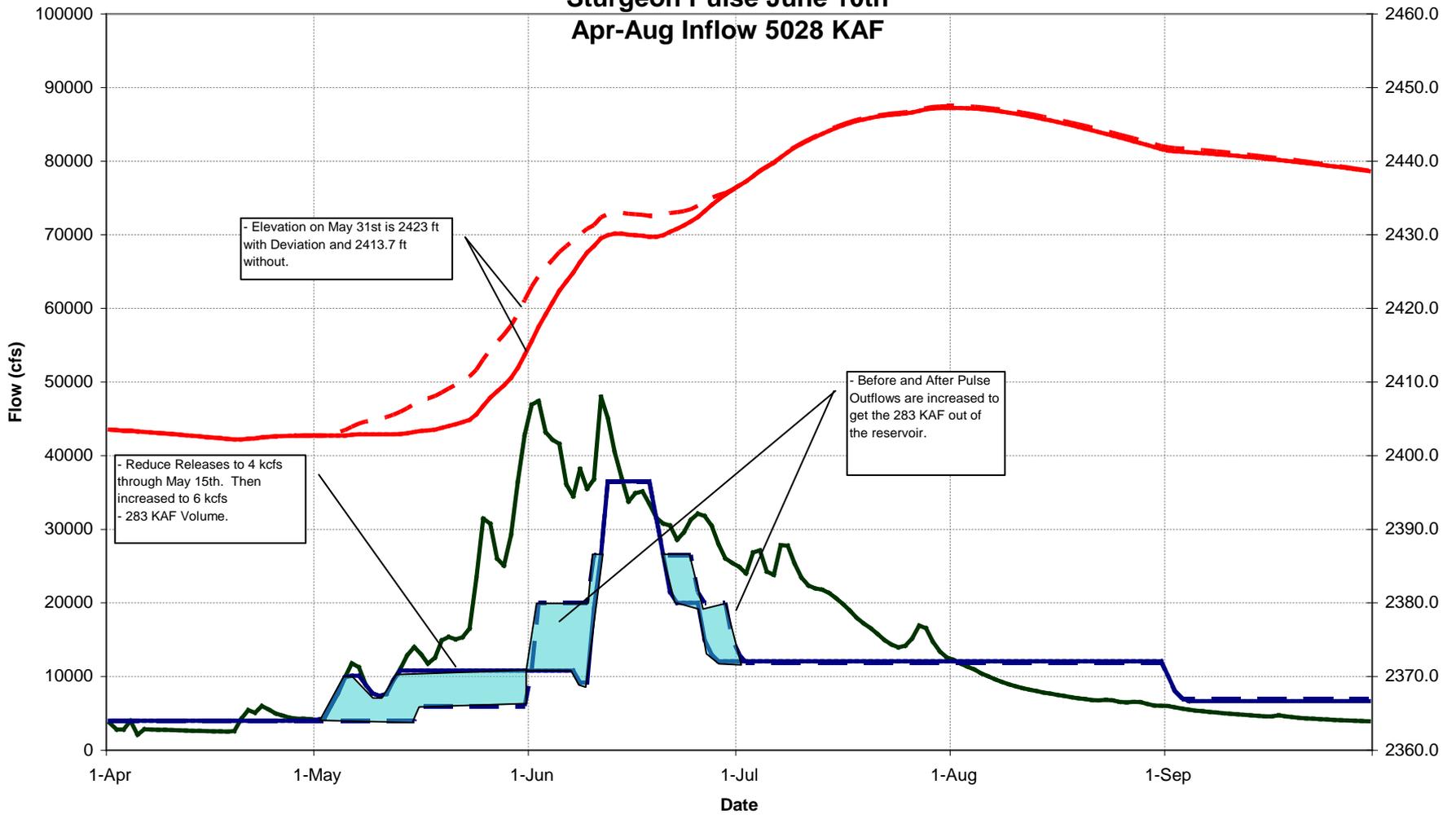


— Inflow
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir

Water Year 2010 - Tier 2 and Sturgeon Pulse June 10th

Apr-Aug Inflow 5028 KAF

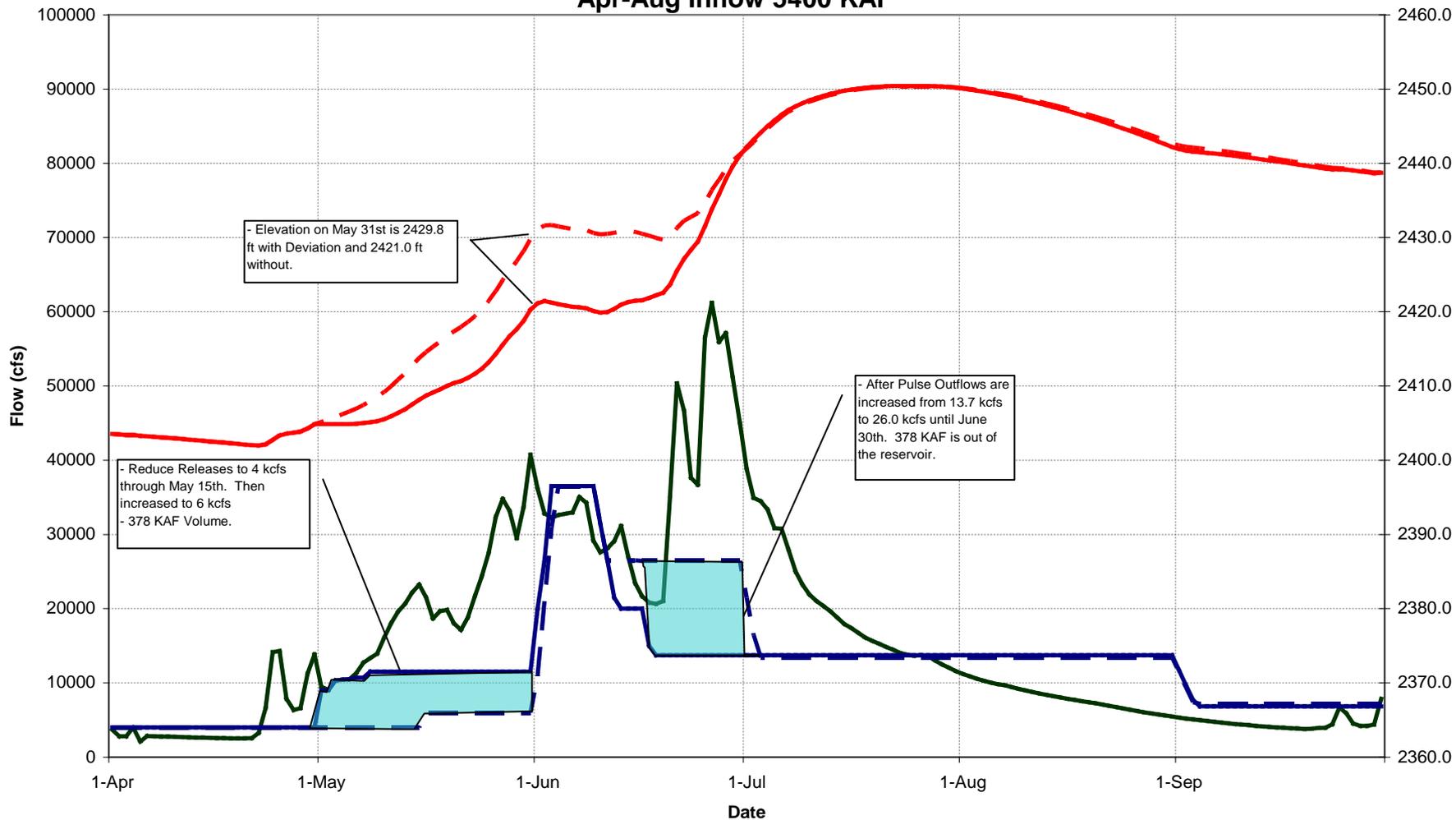


— Inflow
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 - - - Elevation Deviation

Libby Dam and Reservoir

Water Year 2010 - Tier 2

Apr-Aug Inflow 5400 KAF

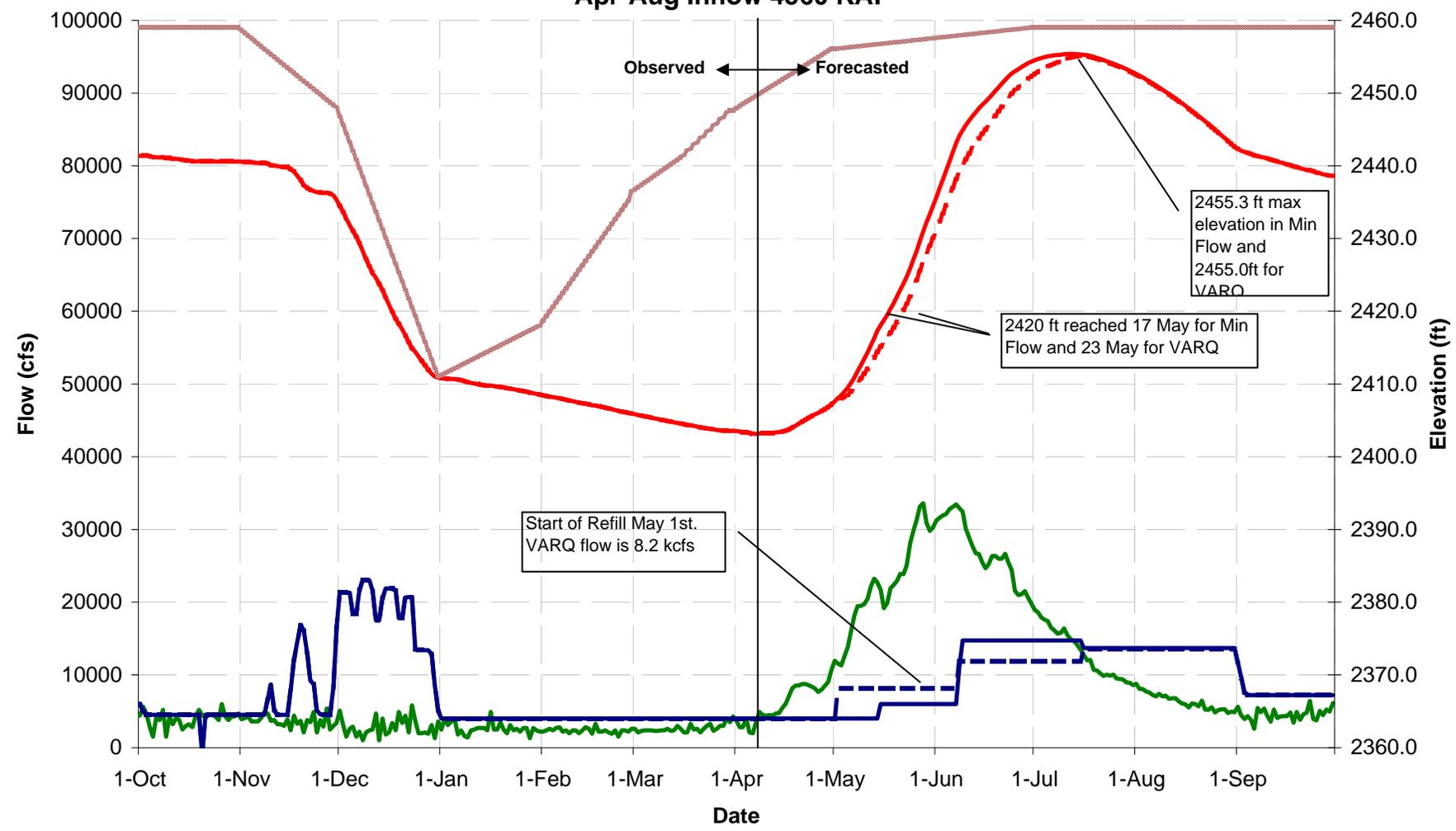


— Inflow
 — Outflow VARQ
 - - - Outflow Deviation
 — Elevation VARQ
 - - - Elevation Deviation

Alt 2: Regulation to target elevations

- Start of Refill is May 1st
- June 1st start of pulse
- Hydrographs are synthetic daily average pattern for each inflow scenario
- Libby Dam can spill 5 kcfs if at elevation 2415 ft and 10 kcfs at elevation 2420 ft.
- See graphs with that target 2443 ft in associated PDF file (Libby Projections with STP.pdf)

Libby Dam and Reservoir Water Year 2010 - Low Year Apr-Aug Inflow 4560 KAF

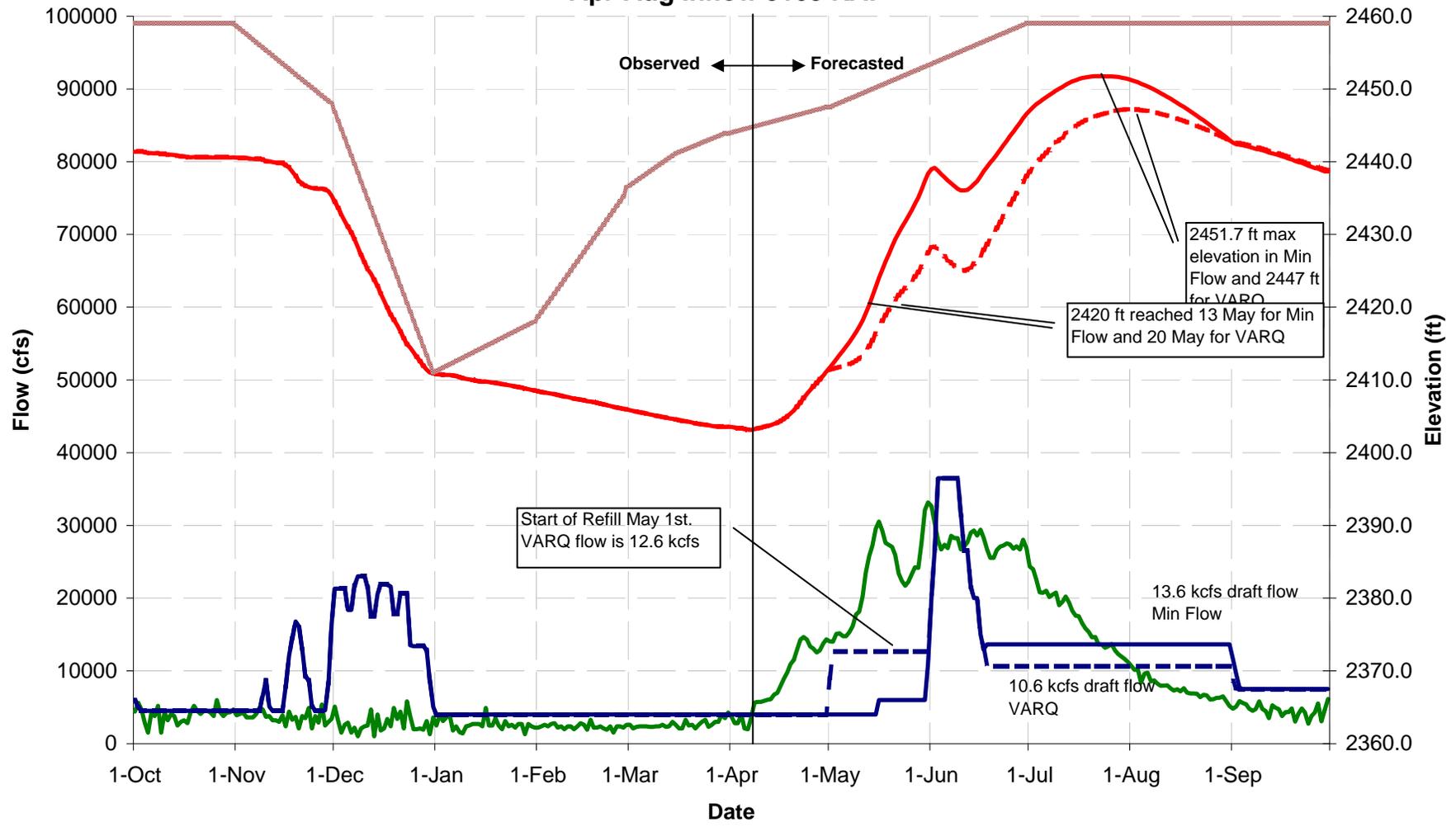


— Inflow
 — Outflow VARQ
 — Outflow Min Flow
 — Elevation VARQ
 — Elevation Min Flow
 — Flood Control

Libby Dam and Reservoir

Water Year 2010 - Median Year

Apr-Aug Inflow 5103 KAF

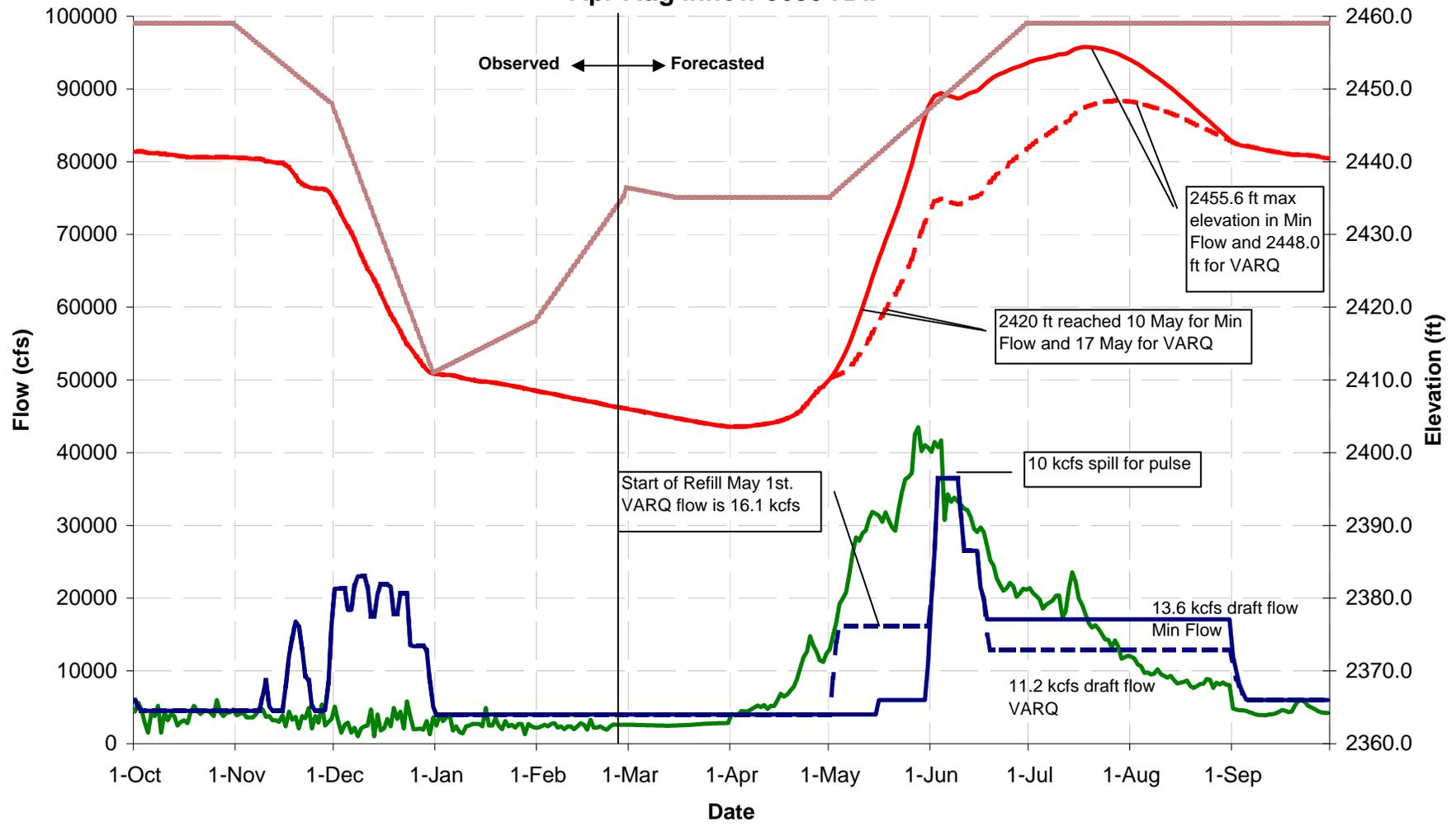


— Inflow
 — Outflow VARQ
 — Outflow Min Flow
 — Elevation VARQ
 — Elevation Min Flow
 — Flood Control

Libby Dam and Reservoir

Water Year 2010 - High Year

Apr-Aug Inflow 5650 KAF

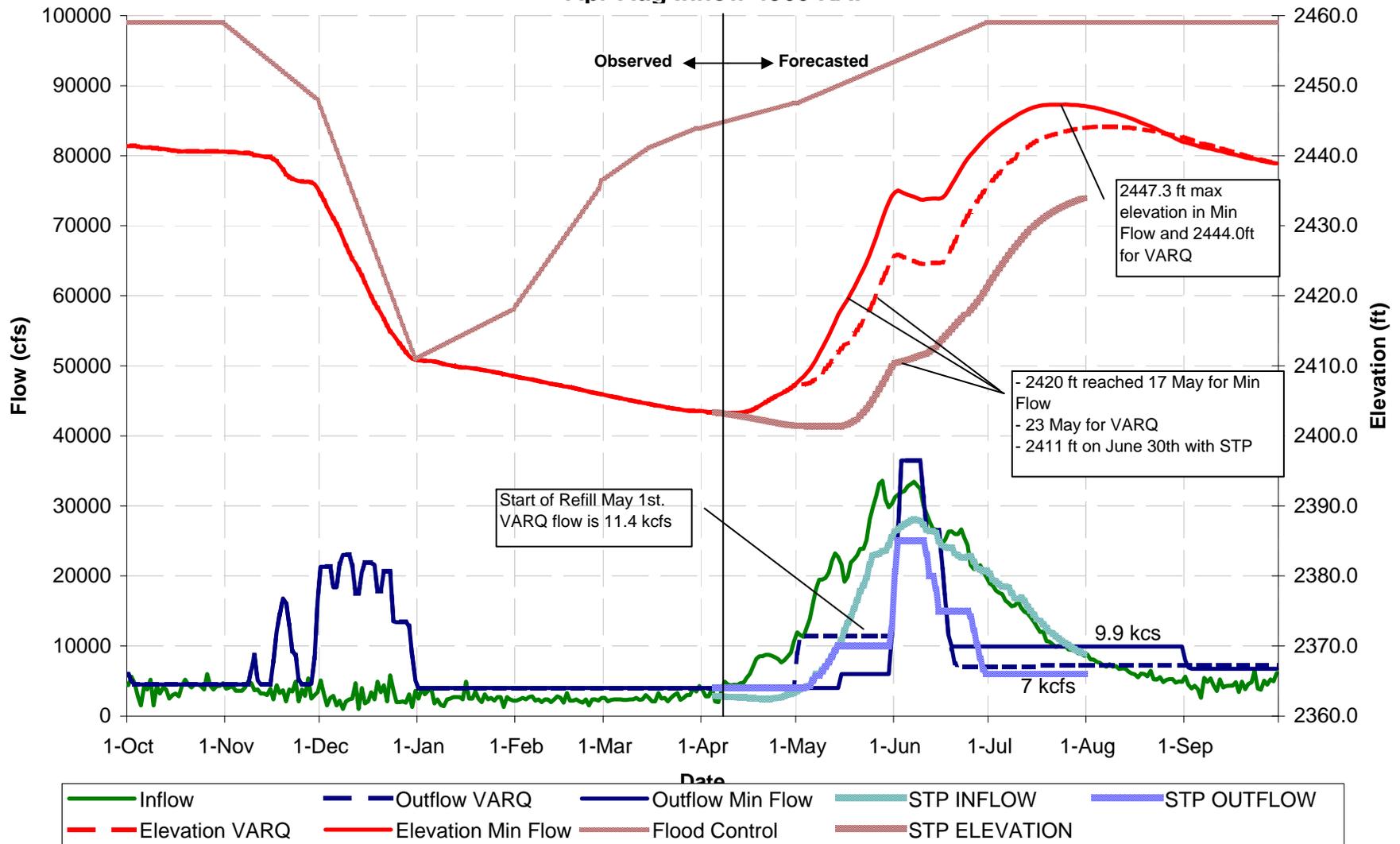


— Inflow
 — Outflow VARQ
 — Outflow Min Flow
 - - - Elevation VARQ
 — Elevation Min Flow
 — Flood Control

Libby Dam and Reservoir

Water Year 2010 - Low Year with Tier 2 Year

Apr-Aug Inflow 4560 KAF



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 21, 2010 Conference Call

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 for April 7 and 14, 2010

There were no changes to either set of notes and both are considered final.

Libby Operations

Steve Barton, COE, directed TMT to several tables and graphs, posted as links to the agenda, detailing modeling data supporting various operational options at Libby dam. He began by reminding TMT members of two alternative operations for Phase 1 proposed and discussed at the 4/14 TMT meeting. He noted that the Initial Control Flow date is still projected for 5/7. As VarQ operations begin 10 days prior to the ICF date, this would have the COE begin to release VarQ flows from Libby on 4/28. The COE proposed to keep Libby Dam discharges at project minimums (4 kcfs) until the May Final Water Supply Forecast is issued, expected on May 05. Paul Wagner, NOAA, shared that this issue was discussed at FPAC and said that the Salmon Managers would add a stipulation to the proposal: that if the May water supply forecast goes down (from the April forecast), that the April forecast would still apply to the amount of water released by the end of May. The COE stated that they found the stipulation acceptable and TMT members were polled on their official positions regarding moving forward with staying at minimum discharges until the May final water supply forecast is released:

- COE: OK
- OR: OK
- WA: OK
- ID: OK
- MT: OK
- Colville Tribe: abstained from providing input on the decision
- BPA: no objection
- BOR: OK

Action/Next Steps TMT members present on the call had consensus regarding Phase 1 of operations, to hold Libby dam at minimum flows until the May final forecast is released on 5/5. (At which time – subject to Phase 2 discussion - the COE will shift to VarQ operations, pending the input from TMT members.)

The COE then moved on to describe options for Phase 2 of Libby operations. In response to requests from TMT members for more detailed information on the options, the COE produced graphing and modeling data to help better explain the various scenarios and outcomes for proposed operations at Libby Dam. Barton and Joel Fenolio, COE, walked TMT through the tables and graphs posted as links to the agenda that showed data for expected flows, elevation and shaping for the Base/VarQ and two alternative operations for TMT to consider. The seven tables detailed the mean, 25th-%, 50th-% and 75th-% flow scenarios at various projects involved in the three operations. Fenolio clarified that the average difference between the Base/VarQ operation and Alternative 1 is that VarQ would yield about 1 kcfs more flow for the May-August period than Alternative 1. The difference between Alternative 1 and Alternative 2 is that Alternative 1 would yield about .6 kcfs more flow for the May-August period.

Rick Kruger, OR, stated that at this point, Oregon is not comfortable with either of the “Alternative” operations. Jason Flory, USFWS, recalled the Settlement Agreement with the Action Agencies to operate Libby for sturgeon and said at this point any deviation operation needs to be in compliance with that agreement. Fenolio said that he felt Alternative 2 best meets the three major needs of the region: the conditions in the Settlement Agreement, the 2008 BiOp and the reservoir refill targets (and associated recreational needs.) Steve Barton, COE, said that at this point, the COE was seeking input and discussion amongst TMT members, as the graphs and tables had been posted the night before the meeting and they acknowledged that TMT members need more time to consider all the data. TMT members thanked the COE for their work in gathering and presenting the supporting data. The COE and BPA clarified that there is not yet a definitive release schedule available for the 1 MAF release from Canada. The COE said that TMT members could have another week to consider the alternatives and a decisive poll on Phase 2 of the operation could be done at the 4/28 TMT meeting.

Kruger and Steve Smith, Colville Tribes, said that they would like to continue discussion of the data with COE following the meeting, so that they could appropriately describe/consider the alternatives within their respective agencies before the TMT meeting next week. Jim Litchfield, MT, and the COE helped to clarify that a lack of consensus at TMT would result in the Base/VarQ operation. Flory said that the Action Agencies have an obligation to do the sturgeon operation described in the USFWS BiOp and that there is a legal obligation to perform the spill test for this and the next two years, but whether conditions allow for the “higher river stage” compliance point planned for the spill test remains to be seen. The COE responded that if there is consensus at TMT to do otherwise, it is legal to do so under the Adaptive Management clause; anything outside of a consensus decision will be up to legal counsel to decide. The COE added that the assumption they are working with currently is that achieving “consensus at TMT” entails notifying TMT members via the distribution lists and phone in advance of a meeting where there is to be a polling of members, polling the members present during the meeting, then following up with TMT members not present after the meeting to offer the opportunity to provide input. TMT members may exercise the right to abstain from any poll if they wish to do so.

Action/Next Steps TMT members will digest the additional data and discuss alternatives for Phase 2 internally within their agencies and with each other

externally over the next week. The COE is looking to take an official poll at the next TMT meeting on 4/28 regarding Phase 2 operations. However, any feedback/questions that can be discussed between now and then will be helpful to the COE and can be directed toward Steve Barton via phone or in person.

Transportation Update

Steve Barton, COE, reported that per the RIOG, the COE is moving forward with a “spread the risk” strategy for transportation. Collection will begin at Lower Granite on April 23rd. Eight days later collection will begin at Little Goose and three days after that, collection will begin at Lower Monumental. Paul Wagner, on behalf of the Salmon Managers noted that the operation was consistent with FPAC’s recommendation. He added that there was some flexibility with the plan in that if any issues are detected during transportation, they will be discussed with TMT. Barton clarified that the COE will spill per the 2010 FOP. Barton asked if there were any objections to the plan for transportation operations as described by the COE. TMT members responded as follows:

- NOAA: no objection
- MT: no objection
- OR: no objection
- ID: no objection
- Colville Tribe: abstaining
- NOAA: no objection
- BPA: no objection
- BOR: no objection

Other

Grand Coulee Flow Augmentation

John Roche, BOR, reported that Grand Coulee was at elevation 1270.80 and meeting flow objectives at Priest Rapids of 90 kcfs as of yesterday. Volume will be analyzed week by week. Paul Wagner reported that it was decided at FPAC to ramp up to 100 kcfs next week, hopefully averaging above 100 kcfs starting 4/26. He noted that Steelhead, Spring Chinook and Sockeye have all been spotted at Rock Island, though not many at McNary. He reminded TMT that emergence timing was three weeks ahead of normal this year and that travel through the Columbia will be slow given the low flows. The goal is to be at 135 kcfs by mid May, likely stepping down in June, depending on flows. Roache added that based on this week’s STP model run, peak flows at Priest Rapids will likely be 116-117 in late May, with Grand Coulee starting refill in June.

Bonneville Operations

Steve Barton, COE, updated TMT on two recent issues:

- Barton followed up on an email sent last Friday 4/16 which reported recent TDG exceedances of the 115% criteria recorded at the Camas/ Washougal gauge. Bonneville is currently spilling at 75 kcfs which appears to be bringing gas levels down, however they are still above 115%, so the COE is currently investigating the cause of the gauge readings. OR and CRITFC commented that the Camas/Washougal gauge is no longer used by state agencies to manage water quality.

- B2 Corner Collector Update: Barton reported that the repair work has been conducted, per the FPOM decision. The B2 Corner Collector closed on 4/20 at 0800 and as of 0900 on 4/21 was still closed due to high winds. Crews are standing by to open the collector as soon as it is safe to do so.

Action/Next Steps Barton will notify TMT members via email when the collector is successfully re-opened.

The next TMT meeting will be: face to face on 4/28 at 9:00am at the COE.

Agenda items will include:

- Notes Review
- Libby Operations
- Updated Weather and Flood Control Forecasts
- Hanford Reach Update
- Water Management Plan - Comments Update
- Priest Rapids Flow Objectives
- Operations Review

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES
April 21, 2010

Notetaker: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of NOAA, Oregon, COE, BPA, BOR, Montana, USFWS, Washington, Idaho, the Colville Tribe, CRITFC and others attended. This summary is an official record of the views expressed and decisions made, not a verbatim transcript. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for April 7 and 14

There were no comments on the minutes for April 7 or 14 today.

3. Libby Spring Operations

Barton led a discussion of the proposal for Libby operations the COE presented to TMT last week. The proposal has two phases, with Phase 1 covering operations in May and Phase 2 covering three potential operations in June including a base case scenario. The COE provided three links to this agenda item today – STP stream flow projections, operational scenarios, and modeling results TMT members requested for Phase 2. Link 3c shows the potential impacts of the three Phase 2 alternatives.

Phase 1 of the COE proposal seeks approval to delay refill of Libby reservoir until the May final forecast is released, probably on May 5. If approved by TMT, Phase 1 would keep the project at minimum discharge instead of VARQ flows until the May forecast is issued. If TMT doesn't reach consensus in support of this proposal, the COE will follow the base case operation, which means restarting Libby refill operations on April 28, 10 days before the projected ICF date of May 7.

Paul Wagner (NOAA) reported that FPAC supports Phase 1 with one stipulation: VARQ flows should start April 28 based on the April water supply forecast. If the May forecast goes down, the April forecast would still apply, i.e. the volume under the current forecast would continue to be released regardless of the May forecast. FPAC is concerned about decreases in the forecast, not increases.

TMT representatives gave their views of Phase 1:

- **NOAA** – Supports the proposed operation.

- **Oregon** – Supports the proposal with the stipulation that it will be flow-neutral by May 31. Oregon would object to any operation that reduces spring flows in the lower Columbia River.
- **Washington** – Supports the proposal.
- **Idaho** – Supports the proposal.
- **Colville Tribe** – Abstained from voting today.
- **BPA** – No objection.
- **BOR** – No objection.

With TMT's unanimous approval of Phase 1, the COE will maintain minimum discharges at Libby Dam until the Seattle district releases the final forecast for May. Subject to the outcome of Phase 2, the project will ramp up to VARQ flows when the final May forecast is known.

Phase 2 would keep the project at minimum outflows after release of the May final forecast until the sturgeon pulse begins, assuming it's a Tier 2 forecast, Barton said. If that's implemented via TMT consensus, there are two alternatives for releasing the stored volume. Alternative 1 would release it by the end of June, Alternative 2 by end August. A third option under Phase 2 is the base case scenario, VARQ operations only.

Joel Fenolio (COE) led a discussion of Item 3c linked to today's agenda, which consists of seven tables showing modeling the COE did in response to TMT requests for more information on Phase 2. All modeling runs are based on the April 6 ESP stream flow forecast for Libby and compare how the three alternatives might affect Libby operations. The spring operation runs from May 5-June 30 and the summer operation from July 1-August 31.

Kootenai Lake discharges water into the Kootenai River in Canada, then into the Columbia River above Grand Coulee Dam. Table 1 summarizes spring releases at Kootenai Lake under the VARQ base case and two alternatives:

- VARQ – 41.9 kaf
- Alternative 1 – 40.8 kaf
- Alternative 2 – 40.2 kaf

Page 3 of the Kootenai Lake data shows a 3% decrease in flows released from Kootenai Lake under Alternative 1 and a 4% decrease under Alternative 2. Rick Kruger (Oregon) asked why the VARQ scenario apparently produces a difference in head. The VARQ scenario produces a higher lake elevation, thus more volume out of Kootenai Lake in May-June compared to the two alternatives, Fenolio replied. This is due to a channel restriction that limits releases from

Kootenai Lake. The difference in actual May-June releases between Alternative 1 and 2 is approximately 600 cfs; between VARQ and Alternative 1, approximately 1 kcfs. In Fenolio's view, Alternative 2 represents the best possible Libby operation in terms of meeting all requirements, including the settlement agreement, the NOAA BiOp, refill operations, and power generation. He led TMT through a discussion of each table.

Table 2 on page 1 of link 3c shows how inflows at Grand Coulee would be reshaped in May under the Phase 2 alternatives. The minimum (worst case) scenario is 1,226 feet elevation Coulee in all cases, which is unlikely. The maximum scenario shows the end of May elevation at 1,259 feet for both Alternative 1 and 2. Grand Coulee elevation is a foot or two lower under the alternatives compared to the VARQ operation.

In terms of providing sufficient flows for the sturgeon spill test at Libby, elevation 2,415 feet is needed in the Libby reservoir to release 5 kcfs and elevation 2,420 feet to release 10 kcfs of gated flow.

Table 3 shows projected Grand Coulee elevations under VARQ flows and the two alternatives. There's no difference in Grand Coulee elevation at the end of May under either alternative, but the base case scenario has a higher end-of-May elevation at Coulee than either alternative, due to the Kootenai Lake issue. The elevation range is 1-2 feet.

Table 4 shows the potential differences in spring operations between Alternatives 1 and 2 and the base case. Barton noted that all scenarios are consistent with Grand Coulee spring flow objectives:

- VARQ – 105 kcfs
- Alternative 1 – 104.5 kcfs
- Alternative 2 – 103.9 kcfs

Grand Coulee is now drafting to produce 90 kcfs flows at Priest Rapids Dam and will probably increase to a 100 kcfs flow objective at Priest Rapids starting next week.

Table 5 shows potential summer releases from Grand Coulee:

- VARQ – 85.6 kcfs
- Alternative 1 – 86.6 kcfs
- Alternative 2 – 86.0 kcfs

Alternative 1 allows Grand Coulee to discharge slightly higher flows than the VARQ operation because it reestablishes head at Kootenai Lake sooner (see discussion of Table 1).

Table 6 shows potential McNary spring operations (May-June):

- VARQ flows – 187.3 kcfs
- Alternative 1 – 186.3 kcfs
- Alternative 2 – 185.9 kcfs

Table 7 shows potential McNary summer operations (July-August):

- VARQ flows – 125.9 kcfs
- Alternative 1 – 26.9 kcfs
- Alternative 2 – 26.3 kcfs

Barton polled TMT on Phase 2, emphasizing that today's poll is preliminary. On April 28, the COE will poll TMT for official recommendations regarding Phase 2 operations at Libby. TMT members gave the COE their initial feedback :

- **Oregon** – Not comfortable with either alternative, due to an apparent reduction of 1 kcfs in spring flows under Alternative 1 and a reduction of 600 cfs under Alternative 2. If Phase 1 is flow-neutral, why would the Phase 2 alternatives reduce spring flows? Will confer with COE representatives immediately after today's meeting to gain a clearer understanding of how the alternatives would affect lower river operations. Abstained from taking a position until the issues are clear.
- **Montana** – Libby Dam is the only project that has been configured to aid passage of white sturgeon, an endangered species. That fact should be a primary consideration in planning Libby operations this year. Ultimately, this could become a legal issue if TMT doesn't reach consensus on one of the alternatives.
- **USFWS** – A settlement agreement and jeopardy ruling says the Action Agencies will operate Libby Dam to provide a spill test for sturgeon in 2010. A deviation from compliance with VARQ via implementation of either Alternative 1 or 2 is needed to be in compliance with the RPA in the USFWS 2008 BiOp.
- **BOR** – The Grand Coulee elevations under either alternative would not be a known cause of irrigation problems.
- **Colville Tribe** – Deferred voting until Grand Coulee operations are discussed (see agenda item 5 below).

In preparation for the final TMT poll on April 28, COE staff will make themselves available over the next week to answer questions regarding Phase 2 of the Libby proposal.

4. Transportation Update

The COE is moving forward with a split strategy of spill and transportation this year, which is consistent with the ISAB recommendation. RIOG and FPAC have already approved this strategy, Wagner said. It means beginning transportation at Lower Granite Dam on May 24 this year, then 8 days later at Little Goose and 3 days after that at Lower Monumental dams.

Barton polled TMT members on the COE's split spill and transportation strategy for spring 2010. **NOAA, Montana, Oregon, Washington, Idaho, BPA** and **BOR** had no objections. The **Colville Tribe** abstained from voting.

5. Grand Coulee Flow Augmentation

The current elevation at Grand Coulee reservoir is 1,270.8 feet, operating to meet a weekly flow objective of 90 kcfs at Priest Rapids Dam, Roache said.

Yesterday the Vernita Bar flow objective was raised from 60 to 90 kcfs, and FPAC has already decided to raise it again to 100 kcfs, Wagner said. The purpose of the increases is to aid steelhead, spring Chinook and sockeye migration from the mid and upper Columbia River, which is already late this year. Continuing to provide low flows would further delay their migration. NOAA's primary focus for spring operations is on maintaining the flow objectives at Priest Rapids, Lower Granite and McNary dams. Priest Rapids is the focal point at the moment, with a goal of 135 kcfs flows sometime in May. An increase to 100 kcfs starting next week will be the next step toward that goal.

Based on STP inflow projections, Priest Rapids flows will peak at 116-117 kcfs in mid or late May, with a low Grand Coulee elevation of 1,259 feet, Roache said. That elevation could drop lower if inflows decline. An elevation in the 1,260-foot range or below indicates vulnerability to 3rd powerhouse entrainment, Tony Norris (BPA) noted.

Steve Smith (Colville Tribe) expressed interest in further conversation with Action Agency representatives regarding Grand Coulee spring flows. He also expressed interest in the FPAC process and in knowing at some point how the Action Agencies plan to release 1 maf of storage in Canada this year.

7. Bonneville Operations Update

Readings at the Camas Washougal gage recently showed TDG levels above 115% per the spring operation as specified in the Fish Operations Plan, Barton said. The Bonneville spill cap was adjusted to 65 kcfs, with that operation to continue as long as Cascade Island or Camas Washougal TDG readings remained below 120%. That operation was approved by TMT members and state water quality agencies and went into effect April 16. Rick Kruger (Oregon) and Tom Lorz (CRITFC) noted that the Camas Washougal gage readings no longer apply to state water quality rules.

Yesterday at 8 am, the B2CC was closed to facilitate work on the transducers and BGS that had been scheduled earlier this month and postponed due to high winds, Barton reported. The closure yesterday was coordinated through FPOM. The B2CC was scheduled to reopen this morning, but high winds are creating unsafe conditions for workers. Barton assured TMT that crews are standing by, ready to reopen the B2CC as soon as possible. The COE will notify TMT via email when the B2CC reopens.

8. Next Meeting

The next TMT meeting will be April 28 at the COE NW division office. Topics covered will include Libby operations in May and June, Hanford Reach protection flows, and Priest Rapids flow objectives.

Name	Affiliation
Rick Kruger	Oregon
Paul Wagner	NOAA
Steve Barton	COE
Joel Fenolio	COE
Tony Norris	BPA
Doug Baus	COE
John Roache	BOR
Greg Hoffman	COE
Barry Espenson	CBB
Jim Litchfield	Montana
Margaret Filardo	FPC
Jason Flory	USFWS Spokane
Karl Kanbergs	COE
Rob Allerman	DeutschBank
Richelle Beck	DRA
Dave Benner	FPC
Russ George	WMC
Eric Trautman	BP Energy
John Hart	EWEB
Holli Krebs	JP Morgan
Sherry XX	Puget Power
XX	Seattle City Light
Tom Le	Puget Sound Energy
Rob Dies	Iberdrola Renewables
David Wills	USFWS
Cindy LeFleur	Washington
Greg Lawson	Point Carver
Brian Marotz	Montana
Russ Kiefer	Idaho
Steve Smith	Colville Tribe
Steve Hall	COE Walla Walla
Shane Scott	PPC
Glen Trager	Shell Energy

Scott English
Laura Hamilton
Greg Hoffman
Steve Hall
Tom Lorz

COE
COE
COE
COE Walla Walla
CRITFC

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday April 28, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

To check into the building, take the elevator to the 5th floor and the guard will issue you an ID badge if you need one and will take you down to the meeting room on the 4th floor. If you have NOT attended a TMT meeting in the past contact Steve Barton (503) 808-3945 so you can be added to the TMT Visitor List and issued an ID badge. This badge may be used indefinitely. If you have attended TMT in the past you may re-use your ID badge indefinitely. If you are a federal employee you will also need to have an ID badge issued to you which can be used indefinitely.

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for April 21, 2010 [\[Meeting Minutes\]](#)
3. Updated Weather and Flood Control Forecasts - Steve Barton, COE-RCC
 - a. [Westwide SNOTEL](#)
 - b. [NWRFC Current Snow Conditions](#)
4. Hanford Reach Update - Russell Langshaw, Grant County PUD
 - a. [Priest Rapids Operation 2010](#)
5. B2CC Update - Steve Barton, COE-RCC
6. System Operation Request - Kyle Dittmer, CRITFC
 - a. [2010 C-1 Operation of the Lower Columbia Pools for the Spring 2010 Treaty Fishery](#)
7. Libby Phase 2 Discussion - Steve Barton, COE-RCC
 - a. [Libby Phase II Ops](#)
 - b. [Libby Water Year 2010 Tier 2](#)

8. Water Management Plan Comments - *Steve Barton, COE-RCC*
9. Priest Rapids Flow Objectives - *Paul Wagner, NOAA Fisheries*
10. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality
11. Other
 - a. Set agenda and date for next meeting - **May 5, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

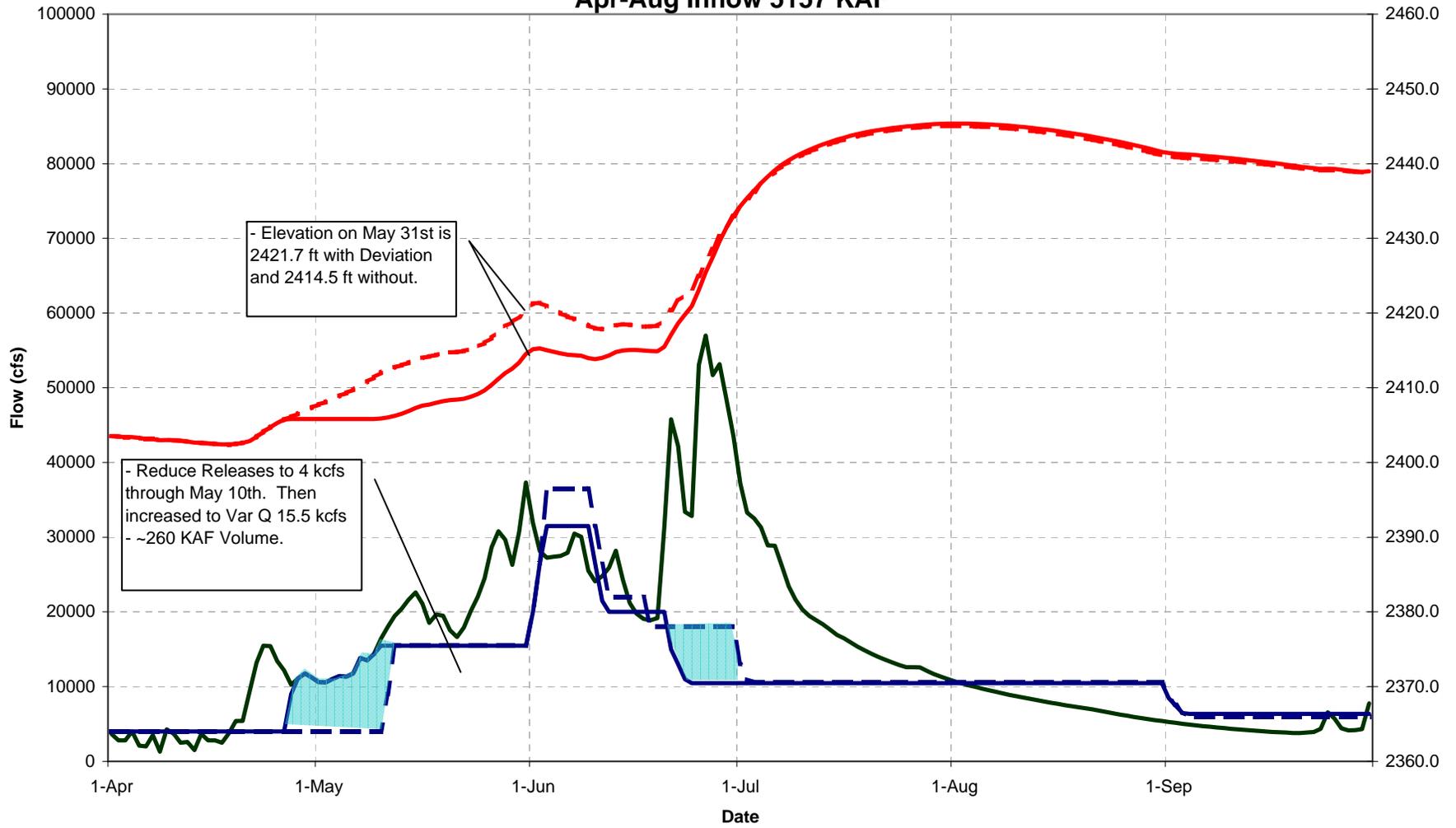
[Steve Barton](#) at (503) 808-3945, or

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

Libby Dam and Reservoir

Water Year 2010 - Tier 2

Apr-Aug Inflow 5157 KAF



- Elevation on May 31st is 2421.7 ft with Deviation and 2414.5 ft without.

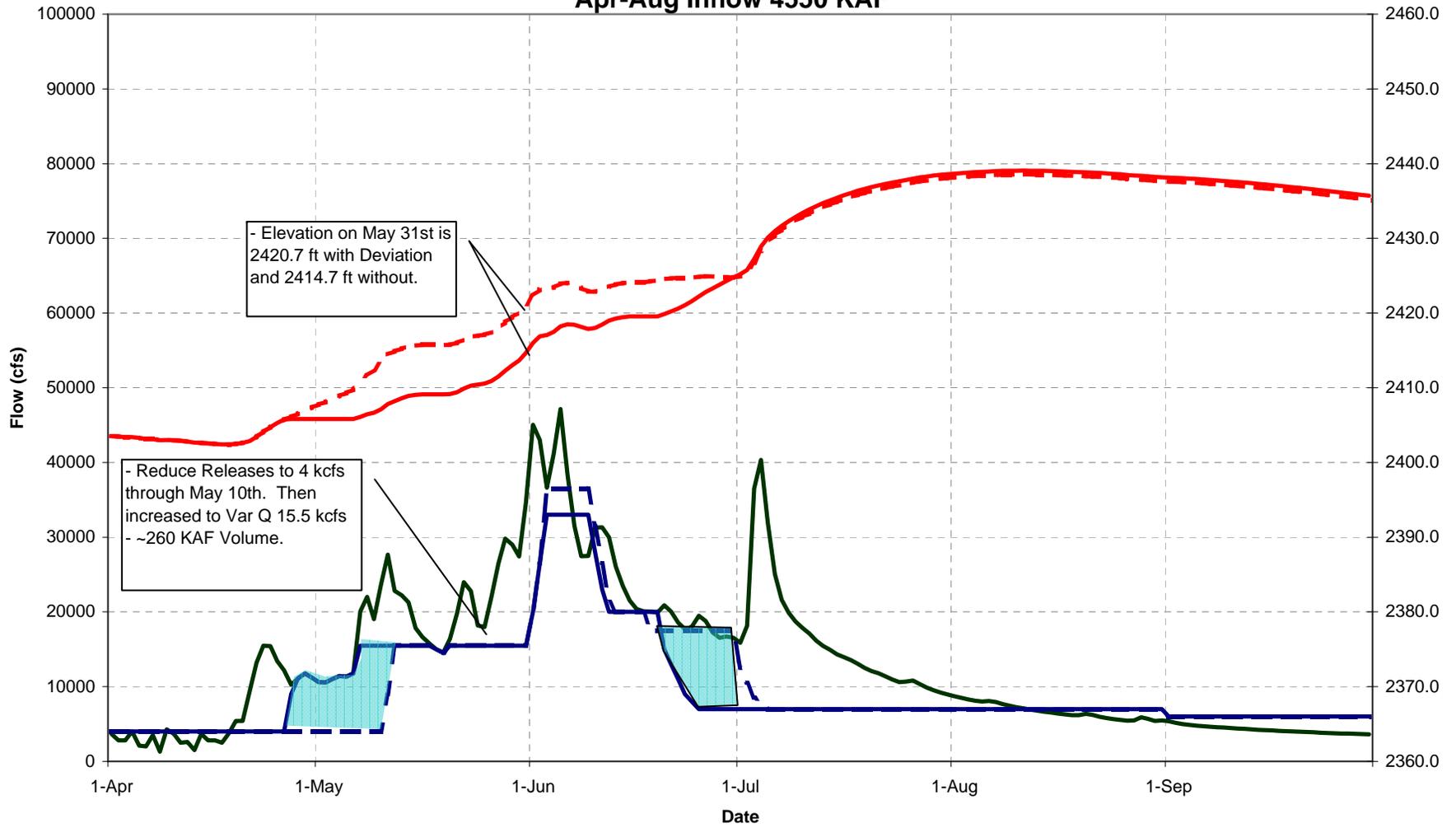
- Reduce Releases to 4 kcfs through May 10th. Then increased to Var Q 15.5 kcfs - ~260 KAF Volume.

— #REF! — Outflow VARQ - - Outflow Deviation — Elevation VARQ - - Elevation Deviation

Libby Dam and Reservoir

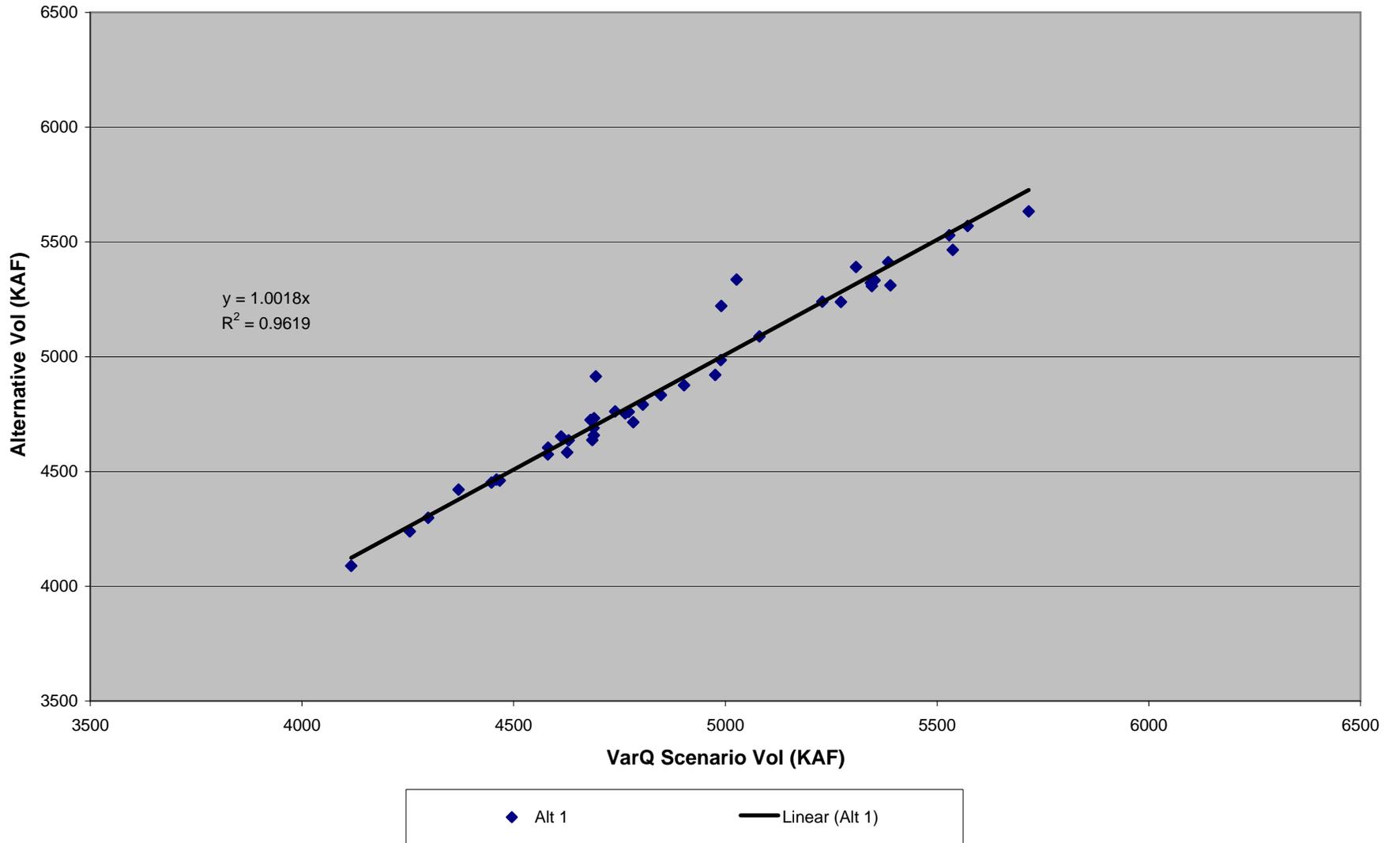
Water Year 2010 - Low Tier 2

Apr-Aug Inflow 4550 KAF



— #REF!
 — Outflow VARQ
 — Outflow Deviation
 — Elevation VARQ
 — Elevation Deviation

Corra Linn Volume Releases

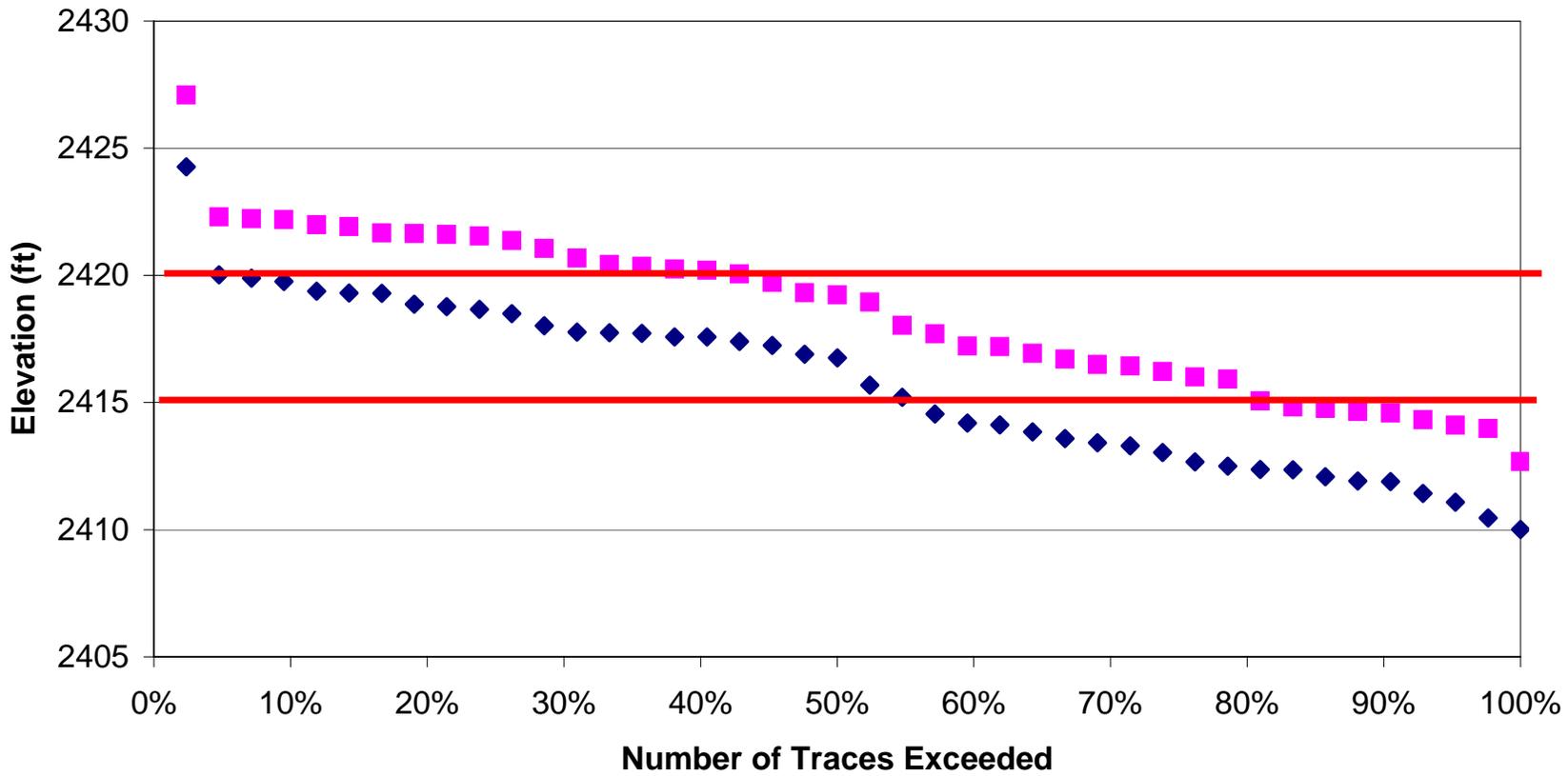


**Corra Linn Volume Release for May 1
to June 30 from Apr 6th ESP Traces**

	VarQ	Alt 1
1949	4902	4876
1950	4117	4089
1951	4782	4714
1952	5273	5239
1953	4694	4914
1954	4740	4761
1955	4448	4451
1956	4976	4921
1957	5529	5529
1958	5308	5391
1959	4990	5221
1960	4682	4725
1961	5346	5308
1962	4612	4653
1963	4627	4583
1964	4581	4574
1965	4630	4635
1966	5229	5240
1967	4581	4604
1968	5081	5088
1969	5572	5570
1970	4690	4732
1971	4805	4791
1972	4764	4753
1973	4685	4637
1974	4255	4239
1975	4298	4298
1976	4772	4760
1977	4689	4658
1978	5027	5336
1979	4370	4420
1980	5716	5633
1981	5537	5466
1982	4459	4465
1983	4467	4460
1984	4689	4689
1985	5344	5322
1986	5352	5333
1987	4989	4985
1988	5385	5412
1989	4848	4833
1990	5390	5311

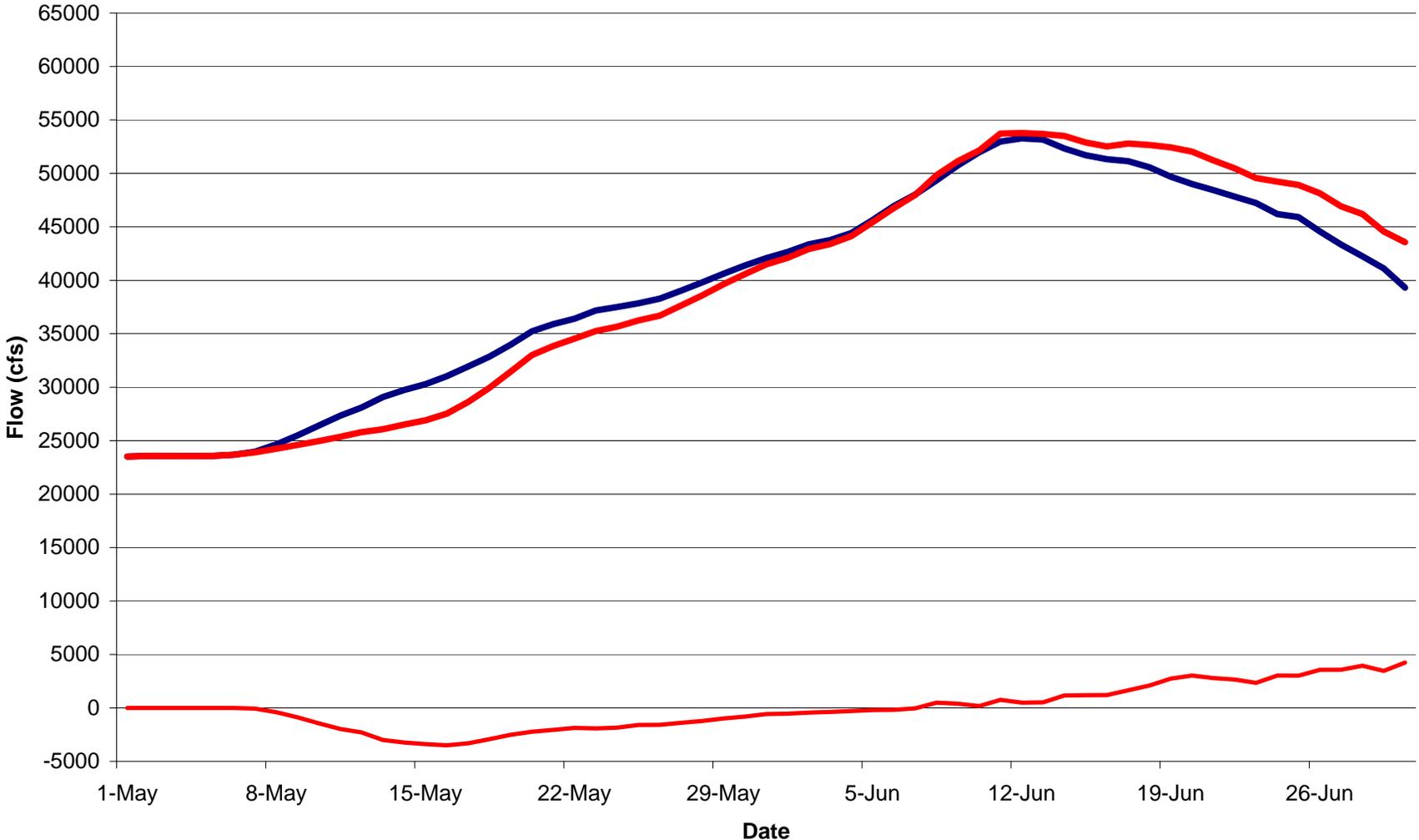
Average 4886 4896

Difference from VARQ (KAF) -9
Average Flow Diff (kcfs) -0.08



◆ May 31 Elevation VARQ ■ May 31 Elevation Revised Operation

Daily 50th Percentile Flows and Differences from VarQ



VarQ Alt 1 Alt 2 Diff Alt 1 - VARQ Diff Alt 2 - VARQ

Phase II

- Tier 2 year declared by WSF being between 4800 – 5400 KAF.
 - Hold 4 kcfs through May 14th then increase to 6 kcfs on May 15th until the Sturgeon Operation starts
 - Increases the chance to spill Libby Dam as part of the settlement agreement
- Alt 1: is to take the volume difference in May and release that same volume around the pulse
 - Flow Neutral
- Alt 2: is to target a flow to reach 2443 ft Aug 31st and then 2439 ft end of Sept.

Alt 1: Flow Neutral

- Start of Refill is May 1st
- June 1st start of pulse
 - Sturgeon operations started June 10th last year
- Hydrographs are actual ESP traces
- Libby Dam can spill 5 kcfs if at elevation 2415 ft and 10 kcfs at elevation 2420 ft.
- After June 30th target 2443 ft 31 Aug

What do we know now?

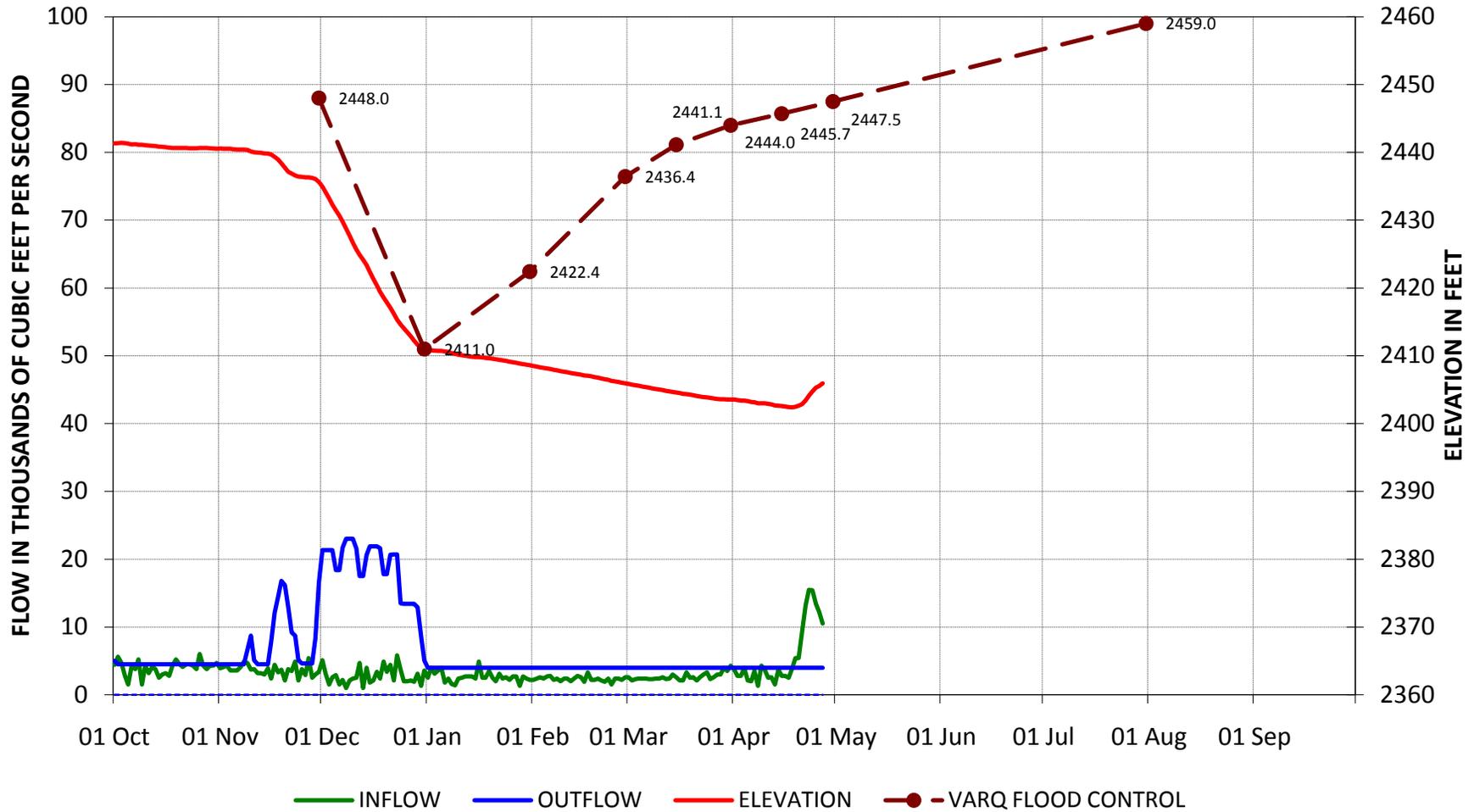
- ICF Date is April 27th and Start of Refill April 17th
 - Increases the VarQ flows from ~10 kcfs to 15 kcfs
 - ~400 KAF needs to be released under Alt 1 around the Sturgeon Pulse
 - 260 KAF is a conservative estimate of what can be released before June 30th

Alt 1 modifications

- Libby will only remain at minimums until 260 KAF has been accounted against VarQ releases
- Then released by June 30th

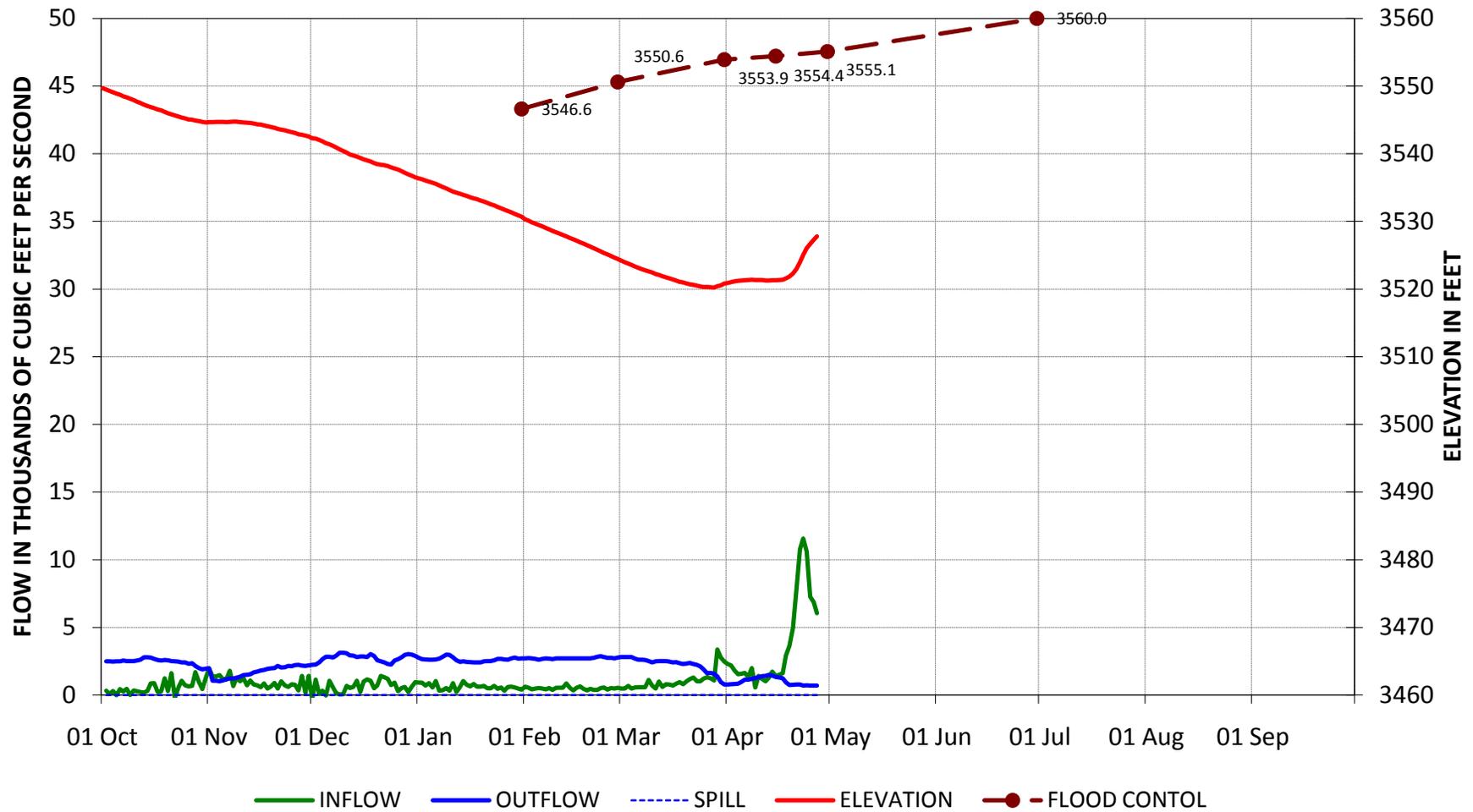
LIBBY DAM AND RESERVOIR

Water Year 2010



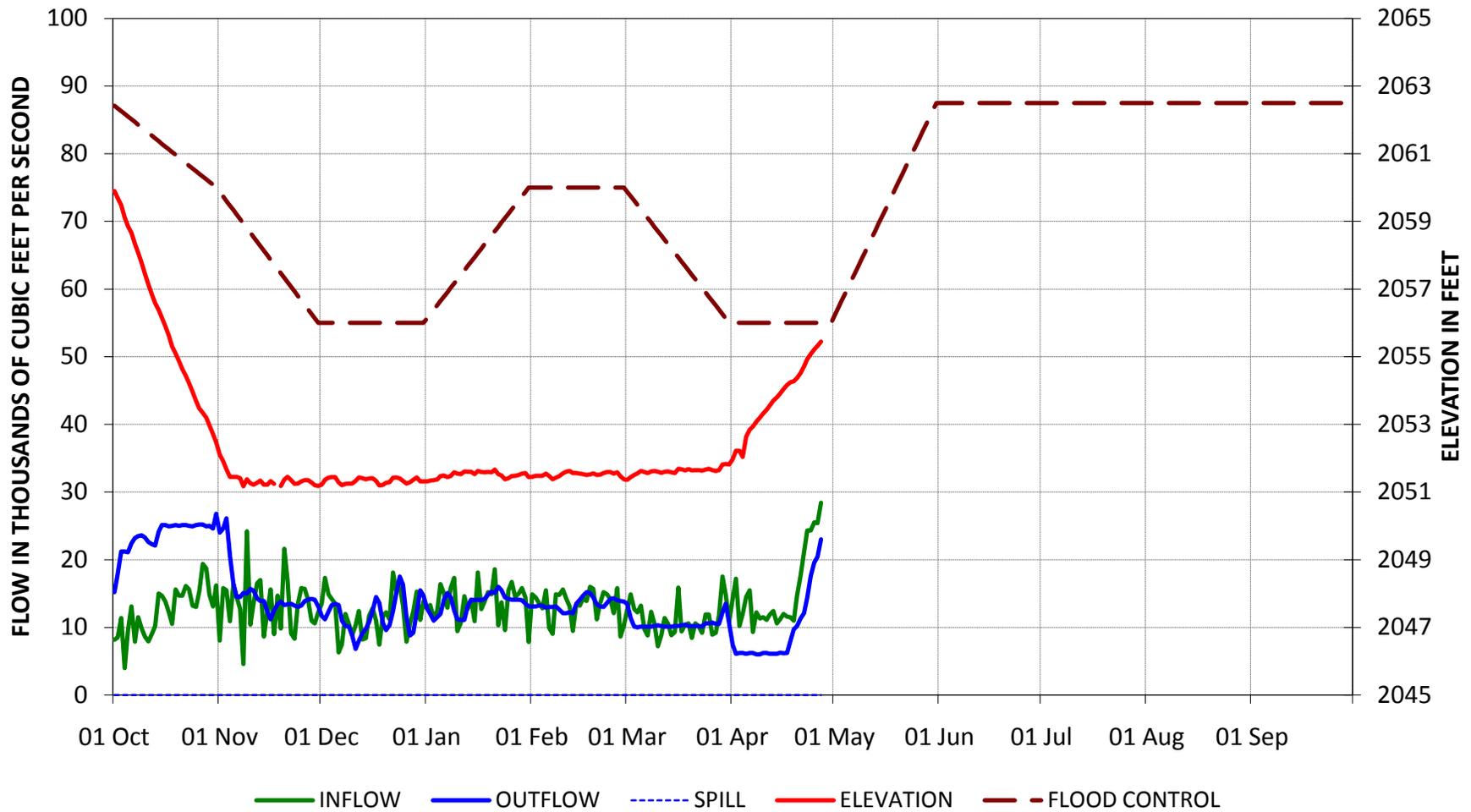
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



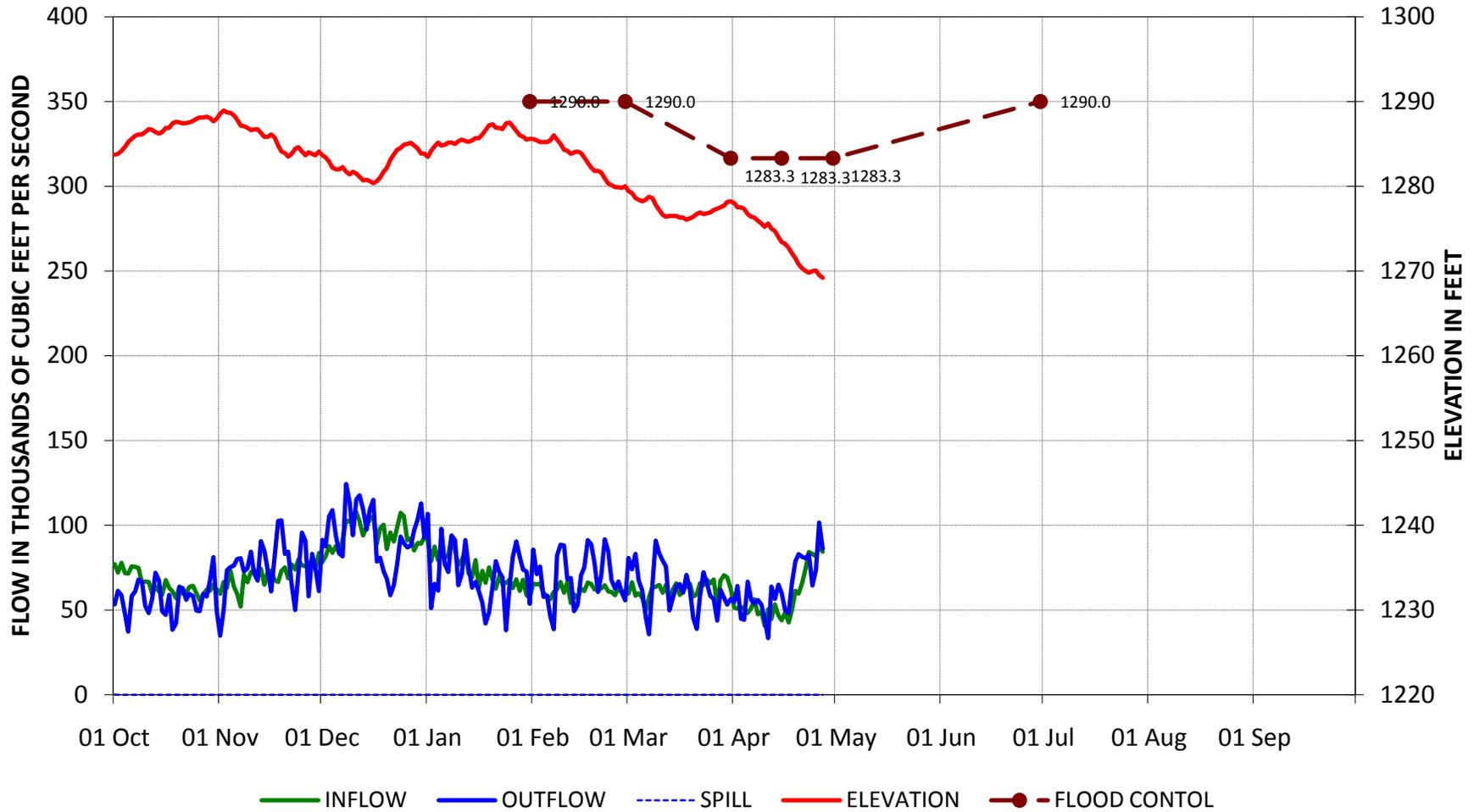
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



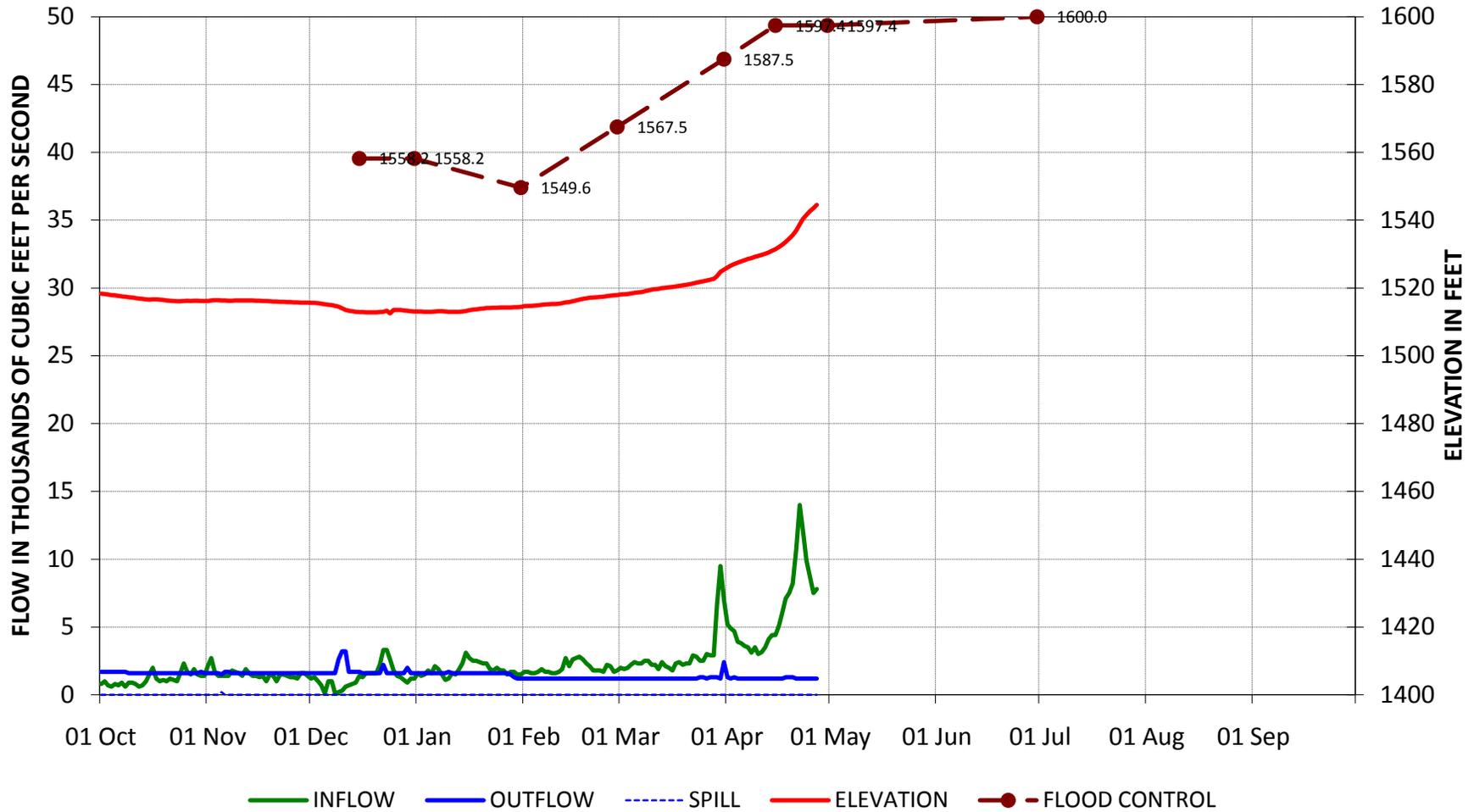
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



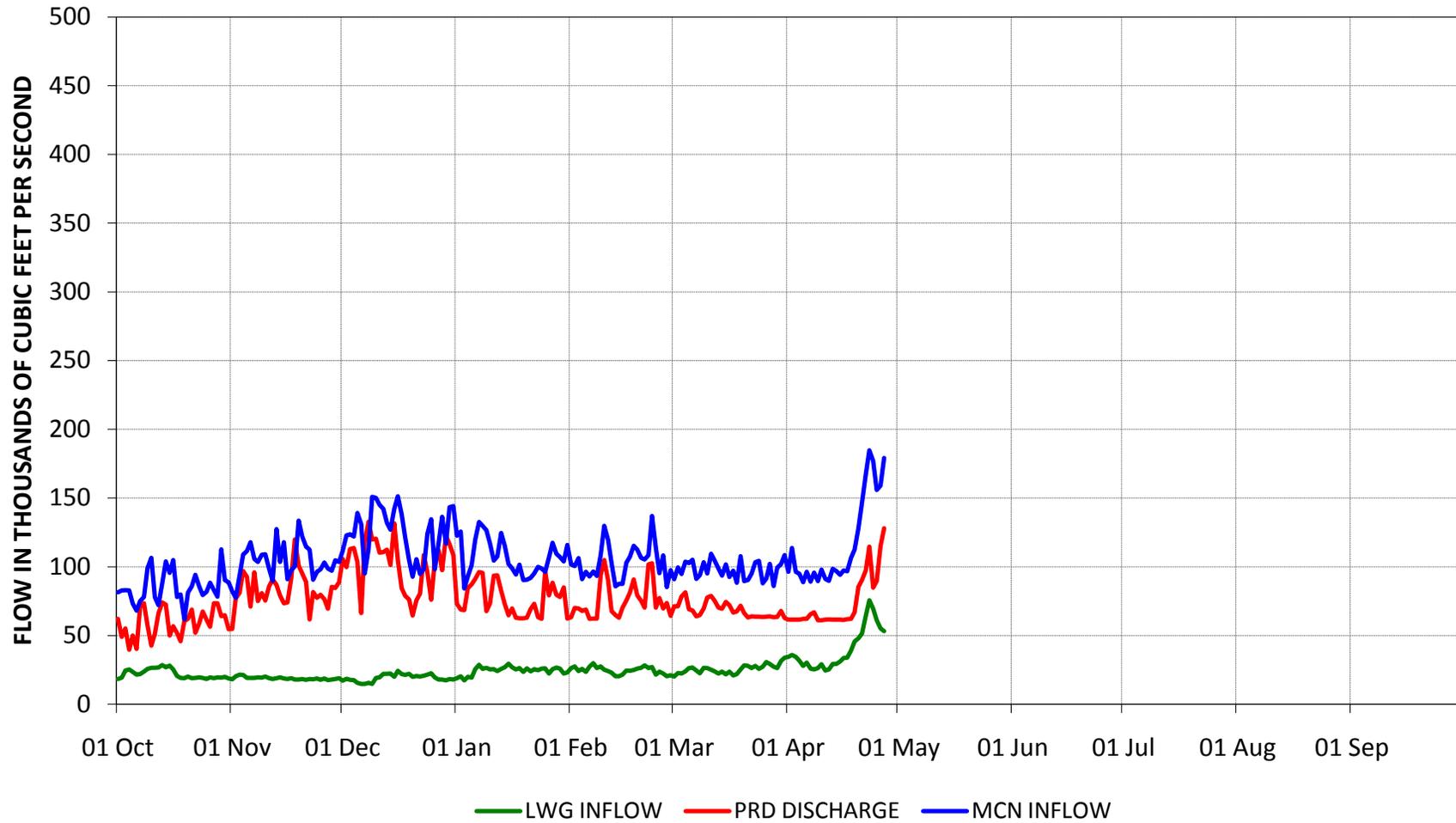
DWORSHAK DAM AND RESERVOIR

Water Year 2010



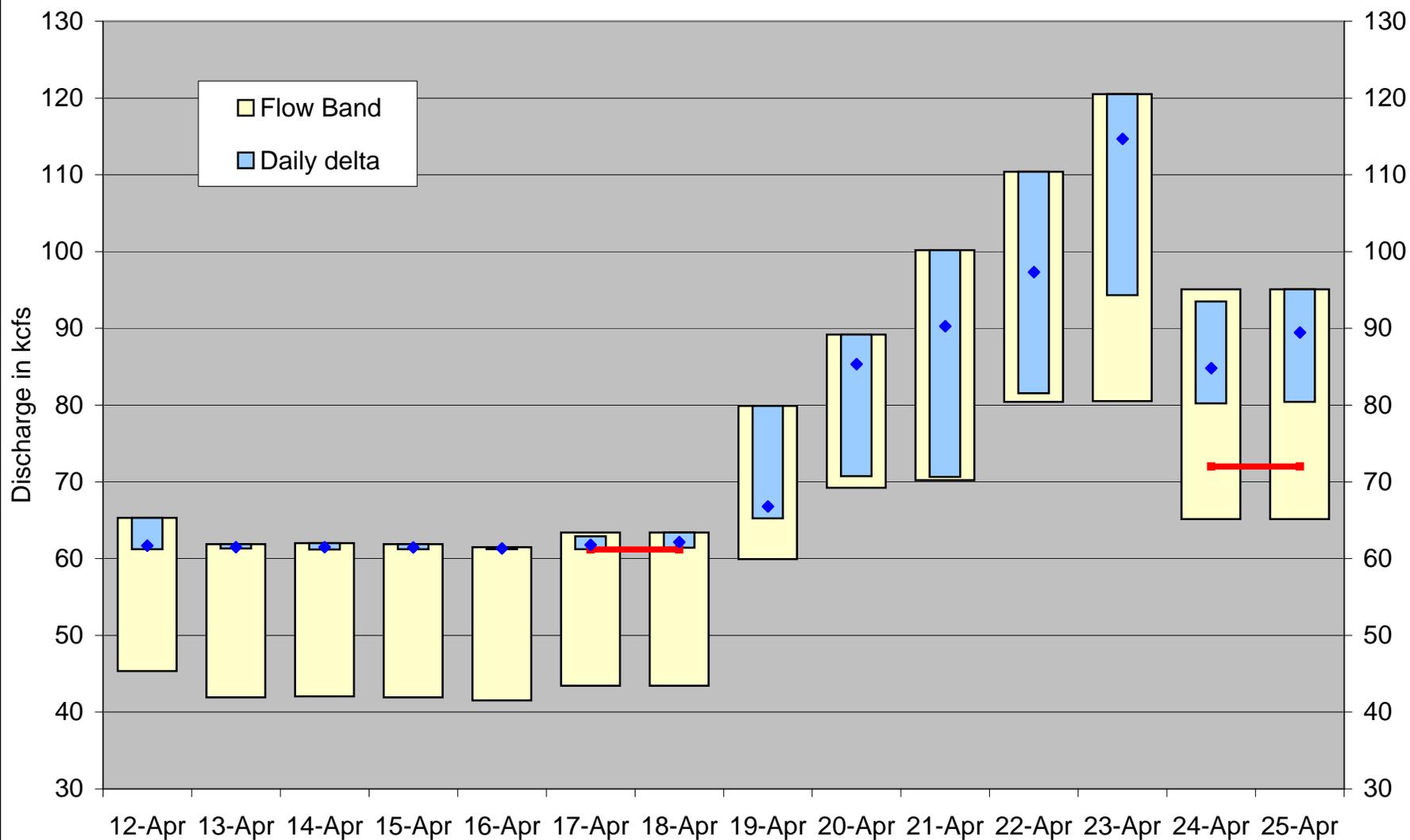
LOWER SNAKE AND LOWER COLUMBIA RIVER FLOWS

Water Year 2010



Priest Rapids Operations 2010

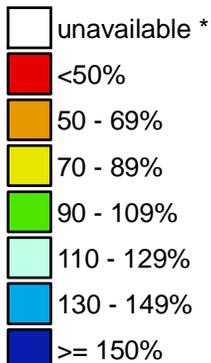
Number of exceedances: 0



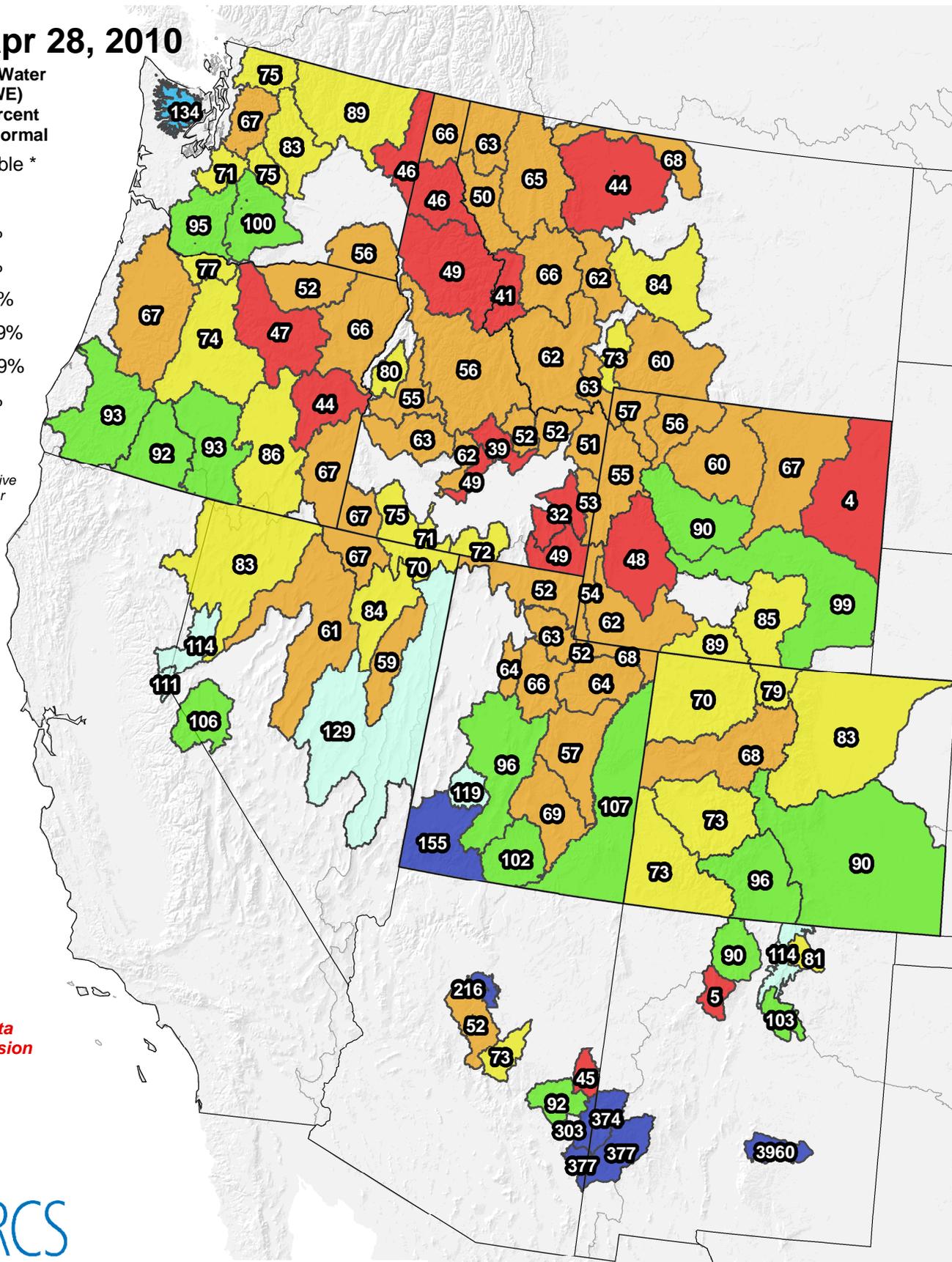
Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

Apr 28, 2010

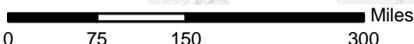
Current Snow Water Equivalent (SWE) Basin-wide Percent of 1971-2000 Normal



* 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

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

April 28, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 April 21, 2010

There were no changes offered to either the facilitator's summary or the official meeting minutes.

Action/Next Steps: The group will revisit and finalize these minutes at the next TMT meeting on 5/5.

Updated Weather and Flood Control Forecasts

Steve Barton, COE, directed TMT to two maps, both posted as links to the agenda. The mid-month forecast was issued on 4/22 by the River Forecasting Center and reported no major changes. Barton noted that the final and early bird forecasts assumed normal precipitation as of April 26th. Currently, the basin as a whole is near to above normal with Grand Coulee at 88%, Snake at 124% and The Dalles at 108% of normal. He reported updated water supply volumes as 64% of normal at The Dalles (June-July), 72% at Grand Coulee (June-July) and 54% of normal for the Snake (April- July). As to the snow pack data, conditions have been cool and moving towards normal, but Barton noted that calculations and statistics have been volatile. He reported that some areas are below to much below normal, but that there are areas with melt conditions and some run-off. Region-wide, a few areas are below 50% of average and much of the region is in the 50-79% of average range. Barton also shared that the ICF was declared as of 4/27, marking the initiation of refill operations at all projects may commence.

Action/Next Steps: This item has been discontinued from future TMT agendas for the time being.

Hanford Reach Update

Russell Langshaw, Grant County PUD, directed TMT to a link, posted to the agenda, which included the previous two weeks' operational data from 4/12- 4/25 (updated data to be posted to the TMT agenda later today). The mean daily discharge was 61.3-114.7, daily maximums were 61.5-120.5, daily delta constraints were 20-40 kcfs and the daily delta was .3-29.2 kcfs. He reported that the first week of protection flows had mean flow deltas of 1.5 kcfs and the second week the mean delta was 20.8 kcfs. He noted that operations have been tight, but that flows were picking up. He further noted that operations are half way through weekend minimum protections (two more weekends to go), with 947 temperature units and that emergence is projected to be done in five days.

Action/Next Steps: Langshaw will provide another update to TMT in two weeks.

B2CC Update

Steve Barton, COE, recalled that as of last week's TMT meeting, the B2CC was closed and the COE was waiting for the high winds to die down to re-open. It re-opened at 31300 on 4/22, but was closed again Monday (4/26) morning due to safety issues surrounding a broken Boat Exclusion device; Barton reported that the B2CC reopened at 10:45 yesterday. He reminded TMT that next year a crane lift is expected to be in place, which will support easier opening/closing of the corner collector.

Action/Next Steps: Barton will update TMT on any activities surrounding the corner collector as necessary.

Spring Treaty Fishing – SOR #2001-C-1

Tom Lorz, CRITFC, detailed for TMT SOR 2010-C-1 posted as a link to the agenda. This SOR marks the beginning of the 2010 Spring Tribal Fishing season. The SOR requested a 1.5' band at Bonneville, John Day and The Dalles pools from 0600 Tuesday 4/27 to 1800 Thursday 4/29. While SOR's are typical this time of year it was noted that the 1.5' band is different than in past years and Lorz explained that it aids in the net setting operations. The COE thanked CRITFC for putting together a very implementable SOR.

Action/Next Steps: The COE will implement the SOR as written; Lorz will report on Treaty Fishing at the next TMT meeting on 5/5.

Libby Phase 2 Discussion

Steve Barton and Joel Fenolio, COE, recapped for TMT the options for Phase 2 of operations at Libby Dam. Barton and Fenolio reviewed power point slides that described the specifics of the options for TMT to consider, noting that the latest water supply data had been incorporated into a new "Alternative 1 modified." They also clarified that sturgeon operations can't begin until May 28th, when all five units of Libby will be available. The COE originally proposed to keep Libby Dam discharge at project minimums (4 kcfs) until the VARQ flows commence, on or about 6/1. The COE said that alternative 1 has now been modified with updated information and that the volume of water stored behind Libby Dam that would otherwise have been released above minimums between the start of refill (April 17th) and the beginning of VARQ flows would be released either by the end of June (Alternative 1) or the end of August (Alternative 2). The COE made the following distinctions for the two "alternative" operations:

Alternative 1 (modified) (release stored volume by the end of June) provides for a volume neutral condition at Libby Dam within spring and minimal impact to Grand Coulee Dam's ability to provide spring and summer flow augmentation in the amounts under the base VARQ operation at Libby Dam. The latest model guidance suggests no significant impact to Grand Coulee refill or spring/summer flow augmentation objectives. The latest results also indicate that the maximum volume that could be stored under this alternative is 260 KAF due to the limited discharge capability and time between the end of the sturgeon operation and June 30. It is estimated that Libby would reach 260 KAF remaining at minimum discharge until approximately May 10, at which time the project

would increase discharge to those derived under the VARQ procedure. Fenolio clarified that it may not be possible to get all 260 KAF out by June 30th. There may be limitations due to hydrologic conditions, maximum outflow constraints at the dam, or other unforeseen issues that would limit the projects ability to release the 260 KAF. It was also noted that while it currently looks like Alternative 1 should be flow neutral on the mainstem it cannot be guaranteed that the actual operation of Kootenay Lake will allow for a 1-to-1 ratio of water to occur had Libby Dam operated to VarQ flows during the spring.

Alternative 2 (release stored volume by the end of August) results in a shift of volume from spring (May-June) to summer (July-August) of between 60 and 200 KAF (reduction of May-June average flow at McNary of 0.5 to 1.7 kcfs, and a corresponding increase in the average flow July-August).

The COE noted that both alternatives provide an increase chance of meeting minimum elevations to allow for the spill provisions of the sturgeon operation at Libby Dam under a Tier II year as specified in RPA, as clarified, of the USFWS 2006 Libby BiOp. The COE's latest modeling results indicated an 80% chance of meeting elevation 2415', which would allow for 5 kcfs spill operation under the proposed operation, compared to a 55% chance under a VARQ operation. The COE data also suggests a 40% chance of meeting elevation 2420', allowing for the maximum spill of 10 kcfs, compared to a 5% chance under a VARQ operation. If the COE's May Final April-August water supply forecast is below 4,800 KAF (e.g. Tier I), then the project would operate to VARQ after the forecast is issued.

Jim Litchfield, MT, stated that it would be better for sturgeon to spread the volume out over a long period of time and asked if it would be possible to do something between Alternatives 1 and 2 and release the stored volume by the end of July. The COE clarified that a "between Alternatives 1 and 2" operation would have an impact on lower Columbia River flows. Paul Wagner, NOAA, noted that information has been changing weekly and forecasts ahead will also affect Libby operations as we move through the season. Barton suggested that if TMT decided to go with Alternative 1, TMT could continue to assess the latest data as time progresses and use adaptive management to make decisions along the way. Rick Kruger, OR, noted that the COE's forecast for Libby has a bias that tends toward the high side and that using it to establish the Tier level (1 or 2) may not be using the best scientific information. Kruger also asked about the sturgeon pulse operations from the previous year; he added that in this low flow year, even with a spill operation, the river may not even get as high as occurred during non-spill pulses due to lower inflows from tributaries below Libby. Jason Flory, USFWS, commented that it is stated in the RPA of the 2006 USFWS BiOp that the spill test will be done in 2010-2012; he added that in future years it would be good to see what TDG levels there are with higher river flows. Flory said he thought it would be prudent to plan operations for the spill test so that if there are higher river stages, all will be in place to take advantage of that. Flory said that an elevation of ~1764' at Bonner's Ferry for 7-21 days when the sturgeon are spawning is what is needed for the test; he acknowledged that there are a unique set of conditions that are needed for the spill test and that it will depend on what flows, precipitation and snow melt levels are over the coming months. The COE stated that with the pulse operation, elevation should be in the range of ~1758-1763'.

Following a brief caucus, Barton clarified that regardless of TMT's input on Libby Phase 2 operations, this issue will be moved to the policy/legal level and the Action Agencies will consider TMT input as they make their final decision. Barton thanked TMT for their good faith participation in helping the COE work through this issue and he also thanked Fenolio and the Seattle District for their presentation of the complex data. An official TMT member poll was taken and the responses were as follows:

- NOAA: okay with Alternative 1, as described, so long as the volume stored is released by June 30. They are not willing to plan on an operation that reduces flows in spring at McNary. On this basis, NOAA objects to Alternative 2.
- OR: Does not object to Alternative 1, subject to the same provisions described by NOAA. Oregon expressed concern over the forecasts. Oregon objects to Alternative 2.
- USFWS: Supports Alternative 1. Alternative 2 does not meet objectives in the lower river (e.g. does not support).
- MT: Montana is fine with Alternative 1 and Alternative 2. Under Alternative 1, Montana would like to revisit the requirement to release the volume by the end of June. Montana also stated Alternative 2 provides a better flow scenario and pool operation from their perspective.
- ID: Supports Alternative 1. Agrees it is a good plan to revisit the June operation (e.g. Montana). Does not support Alternative 2.
- WA: Concurs with the above statements on Alternative 1. Also concurs with the above statements (except for those from Montana) on Alternative 2.
- Confederated Tribes of the Colville Indian Reservation: No objection to Alternative 1. Does not support Alternative 2. Agrees it is prudent to revisit June operations.
- BPA: No objection to Alternative 1 or 2.
- BOR: No objection to Alternative 1 or 2.
- COE: No objections to Alternative 1 or 2.

Action/Next Steps: The COE will reach out to those TMT members not present at today's meeting for their official positions. An update on these operations will be given at the next TMT meeting on 5/5.

Water Management Plan Comments

Steve Barton, COE, reported back to TMT that several comments on the plan have been received by the COE. He requested more feedback from the Salmon Managers, BPA and BOR. He reminded TMT that a copy can be found and downloaded from the TMT site.

Action/Next Steps: Barton asked that suggested changes be submitted to him and Doug Baus, COE, in MS Word track changes. The preferred due date is 4/30 and the drop dead date for submissions is 5/7. The COE will submit the final plan on 5/15. Barton offered that folks may contact him should they have any issues meeting the above deadlines. A final update will be given at the next TMT meeting on 5/5.

Priest Rapids Flow Objectives

Paul Wagner, NOAA, reminded TMT of this week's scheduled ramp up to 100 kcfs. He noted that migration has picked up and that it is in sync with historic timing due to the increased flows. He said that the Salmon Managers recommended that flows be increased to 110 kcfs (weekly average) next week, with a target 135 kcfs ahead.

Action/Next Steps: Priest Rapids flows will be increased next week, with a weekly average target of 110 kcfs. Wagner will update TMT on these operations at the next TMT meeting on 5/5.

Operations Review

Reservoirs: Grand Coulee was at elevation 1269.2' - meeting Priest Rapids objectives. Hungry Horse was at 3527.79', with 0.7 kcfs outflows filling slightly. On Friday April 30th outflows at Hungry Horse will pick up to around 3 kcfs. Starting on April 30 flows out of the Boise River will be approximately 650 cfs for flow augmentation. Flow augmentation for the Upper Snake above Milner will start on May 1 and by May 3, flows past Milner will be around 3200 cfs. Total flow augmentation flows from the Upper Snake will average around 3.85 kcfs for the month of May. Libby was at elevation 2405.94', with 10.5 kcfs inflows and 4.0 kcfs outflows. Albeni Falls was at 2055.44' with inflows of 28.4 kcfs, and outflows of 23 kcfs. Dworshak was at elevation 1544.45' with inflows of 7.8 kcfs and outflows of 1.2 kcfs. Steve Hall, COE, noted that the current water supply forecast shows a 40% probability of Dworshak meeting refill and the project will likely be 5-15' from full. He also noted that no snow has been observed below 4500 and the COE is very concerned about refill. Hall said he will have more analysis for TMT at the 5/5 meeting. Priest Rapids had 100 kcfs outflows, Lower Granite had 53.2 kcfs outflows (peaking at 73) and McNary had 179.2 kcfs outflows.

Fish: Cindy LeFleur, WDFW, reported on adult passage: 110,000 Spring Chinook at Bonneville. She noted that the prediction for the season is 250,000 when looking at the 1980-2009 average, 315,000 for the 10 year average and 685,000 for the 5 year average. She also shared that the run timing is earlier this year. Paul Wagner, NOAA, reported that Yearling Chinook had a high of 166,000 at Lower Granite and that transport started on 4/24. Little Goose transport is starting on 5/2. A 24 hour sample taken on 4/26 yielded 25,000 fish. McNary saw 17,000 and Bonneville saw 30,000. He moved on to report on Steelhead which are picking up; 95,000 at Lower Granite, 46,000 at Little Goose, 8,000 at McNary and 4,000 at Bonneville. TMT then looked at DART webpage data which showed 10,000 adults at Bonneville. Wagner noted that Steelhead are tracking about where they should be for this time of year.

Jim Litchfield, MT, asked if the local sea lion population had become active. Wagner directing TMT to the sea lion link on the TMT page and noted that as of 4/23, 1600 fish have been taken which is similar to data from previous years. TMT planned to check on this link in a couple weeks as more data becomes available.

Power: Tony Norris, BPA, had nothing to report.

Water Quality: Laura Hamilton, COE, reported on exceedances at both the Camas and Ice Harbor forebay gauges, which are typical for this time of year.

Other: David Wills, USFWS, reported that the May release from the Spring Creek Hatchery is scheduled for 5/10, with 4.65 million fish planned for release. The Service is coordinating with the COE on this operation. Wills will report back to TMT on the success of the release.

The next TMT meeting will be: face to face on **5/5 at 9:00 am at the COE.**

Agenda items will include:

- Treaty Fishing Update
- Libby Phase 2 Update
- Spring Creek Hatchery Release Update
- Priest Rapids Update
- Water Management Plan Comments Update
- Operations Review

Future TMT meeting schedule:

5/12 - conference call

5/19 - face to face- COE

5/26 - conference call

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

April 28, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of NOAA, USFWS, Oregon, the COE, Montana, BPA, BOR, CRITFC, Idaho, Washington and others attended. This summary is an official record of the views expressed and decisions made, not a verbatim transcript. Anyone with questions or comments about these notes should provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for April 21

The minutes and facilitator's notes for April 21 will be finalized on May 5.

3. Updated Weather and Flood Control Forecasts

The RFC mid-month water supply forecast was issued April 22, indicating little change from the previous forecast, Barton said. Both the final and early bird forecasts assumed normal precipitation for the balance of the forecast time periods. The April 26 precipitation forecasts are:

- Above Grand Coulee – 88% of average
- Snake River above Ice Harbor – 124% of average
- Above The Dalles – 108% of average

The volume forecast hasn't changed much either:

- The Dalles, Jan.-July – 64% of average, or 68.8 maf
- Grand Coulee, Jan.-July – 72% of average, or 45.6 maf;
April-Sept. – 74% of average, or 47.1 maf
- Snake River, April-July – 54% of average, or 11.7 maf

Snow pack data indicate the region has been cool and is moving toward normal temperatures, though Barton reiterated his earlier warning regarding the statistical definition of "normal" when conditions change as rapidly as they have been. Snow pack is below to far below normal in northern Idaho and western Montana, and slightly below normal in Canada. The snowmelt is well under way, and the region will see some runoff in the coming weeks.

Since TMT last met, the initial controlled flow was declared as of April 27, also the beginning of refill operations. This will have a significant impact on decisions regarding Libby operation (see agenda item 7 below).

4. Hanford Reach Update

Flows at Priest Rapids Dam peaked on April 19, with mean daily discharges of 61.3-114.7 kcfs for April 12-25, Russell Langshaw (Grant PUD) reported. Daily minimum flows were 61.2-94.3 kcfs, and daily maximums ranged from 61.5-120.5 kcfs. Daily delta constraints were 20-40 kcfs, and daily deltas 0.3-29.2 kcfs. For the first week of protection flows, the mean of the daily deltas was 1.5 kcfs, and the second week, 20.8 kcfs.

Flows have started to pick up, allowing more operational flexibility. Weekend minimum protection flows will continue for the next two weekends. Accumulation of temperature units is at 947, with emergence expected to end in about 5 days. Weekend protection flows will continue for another 400 TU's after the end of emergence, or approximately a month.

5. B2CC Update

The transducer installation and BGS work scheduled for April 20 was completed, but high winds prevented the corner collector from reopening that day as planned, Barton said. When the B2CC opened again at 1 pm on April 22, the COE notified TMT members via email. On April 26 at 3:00pm B2CC has been closed again due to safety concerns associated with a broken device that keeps boats out of the B2CC. As of 10:45 am yesterday, April 27, the boat exclusion device has been repaired and the B2CC reopened.

Rick Kruger (Oregon) noted that B2CC closure for wind-related issues won't be a problem next year. A new design will allow the bulkhead to be lifted by a crane without being suspended, which is risky in high winds.

6. SOR 2010 C-1 – Operation of Lower Columbia Pools for Spring 2010 Treaty Fishery

Tom Lorz (CRITFC) presented this SOR, linked to today's agenda. The tribal fishery began yesterday, April 27. CRITFC is requesting a 1.5-foot operating band at Bonneville, John Day and The Dalles pools from 6 am on April 27 to 6 pm on April 29. The COE is implementing the SOR as written.

7. Libby Phase 2 Discussion

Joel Fenolio (COE) led TMT's follow-up discussion of alternatives for the operation of Libby Dam in June through August. Phase 1 of the Libby operation for April and May was approved by TMT last week. Fenolio explained two attachments to this item, a PowerPoint presentation and modeled scenarios.

Most of today's discussion of Phase 2 revolved around Alternative 1, a flow-neutral scenario that would release the volume stored in May (the difference between VARQ and minimum flows) around the sturgeon pulse in June. The

scenarios assume this will be a Tier 2 year including a sturgeon pulse. Alternative 1 aims to be flow-neutral by June 30, thus having no impact on Grand Coulee operations. After June 30, Alternative 1 targets elevation 2,443 feet in Libby reservoir on August 31, then 2,439 feet on September 30. Alternative 2 (not considered in depth today) would use some of the stored volume for summer flow augmentation.

The start of refill being declared on April 27 instead of May 1 as initially projected is a big change in terms of Libby operations, Fenolio explained. The effect is to increase Libby VARQ flows from 10 to 15 kcfs, making it more risky to plan on flow neutrality by June 30 under Alternative 1. Today's discussion included modification of Alternative 1 to address the increased risk.

The original proposal was to hold minimum flows of 4 kcfs through May 14, then increase flows to 6 kcfs from May 15 until the sturgeon pulse starts. The accumulated VARQ volume under Alternative 1 was 280-300 kaf according to last week's projections. Now it's 400 kaf, which is too much to release by June 30 because it would force more spill at Libby, violating TDG limits. Fenolio cited 260 kaf as a conservative estimate of how much water the reservoir could discharge by June 30 at powerhouse capacity. The 260 kaf would be released in addition to the sturgeon pulse.

In response to the ICF date change, the COE modified Alternative 1 so that Libby would only release minimum flows until the 260 kaf is stored in the reservoir, then increase to VARQ flows until May 31. Libby would shift to VARQ releases on May 11-13 under this proposal.

Jim Litchfield (Montana) asked, how flexible is the June 30 deadline for flow neutrality in terms of anadromous fish needs? The purpose of the deadline is to aid Grand Coulee refill and keep Grand Coulee operations as flow-neutral as possible, Steve Hall (COE Walla Walla) explained. Most listed stocks migrate in May and June, and this year's migration will definitely extend into June under the low-flow conditions, Wagner noted. It will be especially important to schedule releases during the migration benefit period this year.

Jason Flory (USFWS Spokane) asked, what if sturgeon flows started early? That would make flow neutrality more achievable, but it won't be possible to use all five units at Libby until May 28, assuming scheduled repairs proceed as planned, Fenolio said. The unit outages would make it impossible to provide sturgeon flows earlier.

Fenolio presented graphs that depict modified Alternative 1 operations under different water supply scenarios, assuming this is a Tier 2 year with a sturgeon pulse. Modification of Alternative 1 increases the likelihood of reaching elevation 2,420 feet in Libby reservoir, required for 10 kcfs of gated spill for the sturgeon spill test. By contrast, the VARQ scenario would yield an elevation of around 2,415 feet on May 31, or 5-6 kcfs of gated spill for the test, but not the full 10 kcfs specified in the settlement agreement.

The first graph in attachment 7b shows an April-August inflow volume of 5,157 kaf, with an elevation of 2,421.7 feet on May 31 under Alternative 1, and 2,414.5 feet under the VARQ flow scenario. The second graph contrasts the same two operations with an inflow volume of only 4,550 kaf. The third graph shows potential releases from Corra Linn Dam, which can constrict releases from Libby. At present, the graphs indicate the VARQ and deviation (Alternative 1) scenarios would both release the same volume from Corra Linn. By contrast, last week's data showed that only 97% of the water released under the deviation was able to pass through Corra Linn. The elevation at Corra Linn would be higher under Alternative 1 than under the VARQ scenario.

Barton noted that the volume released during Phase 1, which was approved by TMT last week, should have no impact on the ability to achieve sufficient elevation for the spill test because Phase 1 is flow-neutral compared to the VARQ scenario. Karl Kanbergs (COE) noted that the shape of actual inflow and runoff, not just volume, will drive Libby operations. In effect, the Phase 2 deviation request would replace Phase 1 if TMT approves Alternative 1, Litchfield and Barton noted.

Rick Kruger (Oregon) expressed concern that Alternative 1 would affect the flow neutrality of Phase 1. An overriding goal of Alternative 1 is to make Grand Coulee operations flow-neutral, Barton replied. Fenolio said there's still some risk of trapped water at Corra Linn Dam, but that appears unlikely.

The final graph in attachment 7b compares Libby reservoir elevations based on multiple inflow traces. Alternative 1 has approximately an 80% chance of providing 5 kcfs spill and a 40% chance of providing 10 kcfs spill for the spill test, according to these projections. Limiting the amount below VARQ flows to 260 kaf would make the impact on Corra Linn as flow-neutral as possible.

Litchfield suggested a compromise between Alternatives 1 and 2: release the stored water by June 30 instead of May 31. Wagner and Kruger noted that a change in the inflow forecast could impact the ability to provide 10 kcfs for the spill test. Barton noted that it will be possible to give Litchfield's idea further consideration while taking new forecasts into account as updated information becomes available.

In summary, there's about an 85% chance of spilling 5 kcfs and about 45% chance of spilling 10 kcfs under the modified Alternative 1, Fenolio said. Under VARQ flows, those odds shift to a 50% chance of 5 kcfs spill and less than 10% chance of 10 kcfs spill for the spill test.

Barton polled TMT members on their views of Phase 2. He will solicit the views of any member not present today.

- **NOAA** – Supports Alternative 1 of Phase 2 as long as the stored volume is released by June 30. Might support another approach if updated

information indicates it wouldn't conflict with the overriding goal of shaping declining flows. Would object to a decrease in flows that impacts migration of listed stocks.

- **Oregon** – Doesn't object to Alternative 1 as modified, but has concerns about the risks associated with forecasting. Would object to Alternative 2.
- **USFWS** – Supports Alternative 1 but would object to Alternative 2.
- **Montana** – Supports Alternative 1 because it maximizes the chance of providing a good sturgeon operation this year. Wants TMT to revisit Libby operations in June and consider the possibility of a more gradual ramp down of stored releases. Requested updates on Libby operations at each meeting in May and June. Would support Alternative 2.
- **Idaho** – Supports Alternative 1. Agrees that Libby operations should be revisited in June. Would object to Alternative 2.
- **Washington** – Agrees with NOAA, USFWS and Idaho on Alternative 1. Agrees with Montana regarding further decision-making in June. Would object to Alternative 2.
- **Colville Tribe** – No objection to Alternative 1; would object to Alternative 2. It's prudent to revisit Libby operations in June.
- **BPA** – No objection to either Alternative 1 or 2.
- **BOR** – No objection to either Alternative 1 or 2.
- **COE** – No objection to either Alternative 1 or 2.

With consensus on Alternative 1 as modified, the COE will proceed with legal and policy review leading to implementation. TMT will review Libby operations again on May 5, when the final May forecast is available, and weekly throughout May and June. As requested by Montana and others, the COE will reopen the decision process in June.

8. Water Management Plan Comments – Spring/Summer Update

The COE has received Action Agency comments on the WMP spring/summer update but has yet to receive comments from the Salmon Managers. Doug Baus (COE) solicited their comments in "track changes" format. While the deadline for final publication is May 15, the spring/summer update is essentially a living document. The absolute deadline for comments is May 7, with substantive comments due by April 30.

9. Priest Rapids Flow Objectives

The flow objective for Priest Rapids is 100 kcfs this week, , but FPAC increased it to 110 kcfs next week to accommodate increased migration, Paul Wagner (NOAA) said. The flow objective is a weekly average. FPAC will reconsider it each week in light of updated information. The ultimate goal is to provide 135 kcfs if inflows allow. Like Libby operations, this topic will remain on TMT's weekly agendas throughout passage season.

10. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,269.2 feet, releasing 100 kcfs (weekly average) for Hanford Reach protection flows. Hungry Horse is at elevation 3,527.79 feet, discharging 700 cfs and filling slightly. Discharges from Horse will increase to about 3 kcfs on April 30. Flow augmentation from the upper Snake will start on April 30 from the Boise system and May 1 from the Upper Snake above Milner. Total Upper Snake flow augmentation is projected to average around 3.85 kcfs for the month of May, John Roache (BOR) reported.

Libby is at elevation 2,405.94 feet, with inflows of 10.5 kcfs and outflows at minimums of 4 kcfs. Albeni Falls is at elevation 2,055.94 feet with inflows of 28.4 kcfs and releases of 23 kcfs.

Dworshak is at elevation 1,544.45 feet and refilling to the extent possible. Steve Hall estimated a 40% chance of Dworshak refill this year, based on the COE's official April water supply forecast. The odds increase to 50% based on the mid-April STP regression forecast, which is a single trace forecast. Dworshak is one of the basins with less than 50% of average water supply this year. Next week, the COE will show TMT an analysis of how many feet the reservoir might fall short of its refill target.

Lower Granite inflows peaked at 73 kcfs a few days ago and are now 50.2 kcfs. McNary inflows are 179.2 kcfs.

b. Fish. Adults: Approximately 111,000 spring Chinook passed Bonneville, Cindy LeFleur (Washington) reported. This year's run isn't as late as it has been for the past 5 years. Wagner noted that 111,000 is about double the 10-year average seen to date, with more fish coming.

Juveniles: Daily smolt reports for the past 2 weeks show they're still appearing at tributary traps, which means more are coming, Wagner reported. The latest passage index for spring Chinook at Lower Granite was 166,000, the highest count so far this season. The previous seasonal high was 121,000 fish at Lower Granite during the spring freshet on the Snake. Transport began on April 24 at Lower Granite; it will start on May 2 at Little Goose. The latest passage index for yearling Chinook is 25,000 at Little Goose, which shows that migration is taking longer than usual. The yearling Chinook passage index is 117,000 at McNary, and 30,000 at Bonneville. For steelhead, it's 95,000 fish at Lower Granite; 46,000 at Little Goose; 8,000 at McNary; and 4,000 at Bonneville. Smolt

passage is at or above the 10-year average for the past week, while steelhead passage is average.

Pinnipeds: As of April 23, 11 California sea lions were trapped and 9 removed from the Bonneville Dam area; 53 Stellers have been observed. Recent catch data indicate increased sturgeon consumption, presumably by Stellers.

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

d. Water Quality. During the past 2 weeks, there have been a few exceedances at Camas Washougal and Ice Harbor forebay, which is typical for this time of year, Laura Hamilton (COE) reported.

11. Next Meeting

The next TMT meeting will be May 5 at the COE NW division office. Agenda items will include the treaty fishery, Priest Rapids protection flows, Libby Phase 2 operations, the Spring Creek Hatchery release, WMP final comments, and the usual operations review.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Paul Wagner	NOAA
Rick Kruger	Oregon
David Wills	USFWS
Doug Baus	COE
Jim Litchfield	Montana
Tony Norris	BPA
John Roache	BOR
Kim Johnson	COE
Rob Dies	Iberdrola Renewables
Karl Kanbergs	COE
Dan Feil	COE
Joel Fenolio	COE
Laura Hamilton	COE

Phone:

Brian Marotz	Montana
Scott Bettin	BPA
Jason Flory	USFWS Spokane
Tom Lorz	CRITFC
Greg Hoffman	COE
Steve Hall	COE Walla Walla
Mike Shapley	Snohomish PUD
Tim Heizenrader	Centaurus
Holli Krebs	JP Morgan
Rob Allerman	Deutsch Bank
Russ George	WMC

Greg Lawson
XX
Russell Langshaw
Barry Espenson
Richelle Beck
Russ Kiefer
Cindy LeFleur
John Hart
Mark Bagdovitz
Sherry XX
Margaret Filardo
Sherry Sears

Point Carbon
Seattle City Light
Grant PUD
CBB
DRA
Idaho
Washington
EWEB
USFWS
Puget Power
FPC
Colville Tribe

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday May 5, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

To check into the building, take the elevator to the 5th floor and the guard will issue you an ID badge if you need one and will take you down to the meeting room on the 4th floor. If you have NOT attended a TMT meeting in the past contact Steve Barton (503) 808-3945 so you can be added to the TMT Visitor List and issued an ID badge. This badge may be used indefinitely. If you have attended TMT in the past you may re-use your ID badge indefinitely. If you are a federal employee you will also need to have an ID badge issued to you which can be used indefinitely.

**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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

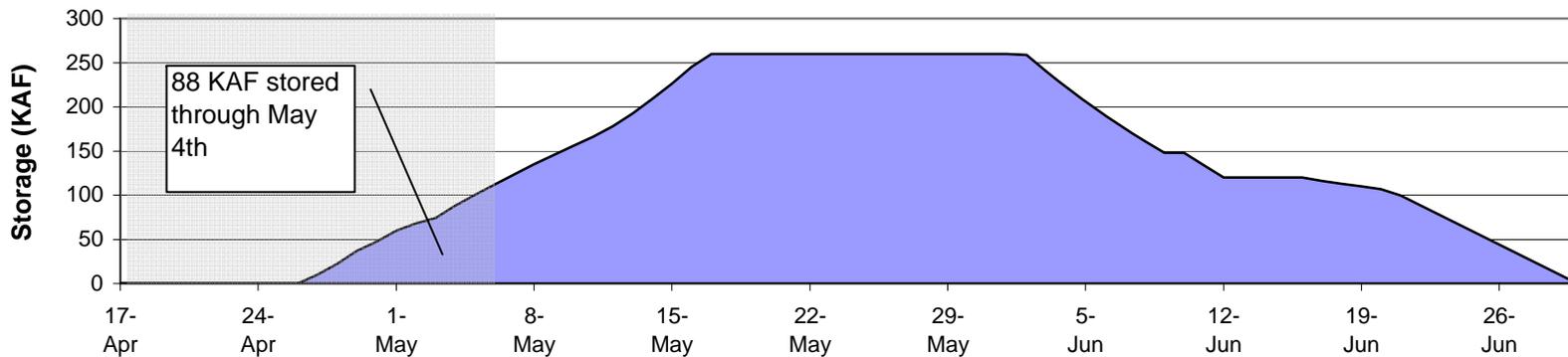
AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for April 28, 2010 [\[Meeting Minutes\]](#)
3. Updated Weather and Flood Control Forecasts - Steve Barton, COE-RCC
4. Libby Operations - Steve Barton, COE-RCC
 - a. [Storage Accounting](#)
5. Water Management Plan Spring/Summer Update (Due May 7) - Steve Barton, COE-RCC
6. Priest Rapids Flow Objectives - Paul Wagner, NOAA Fisheries
7. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality

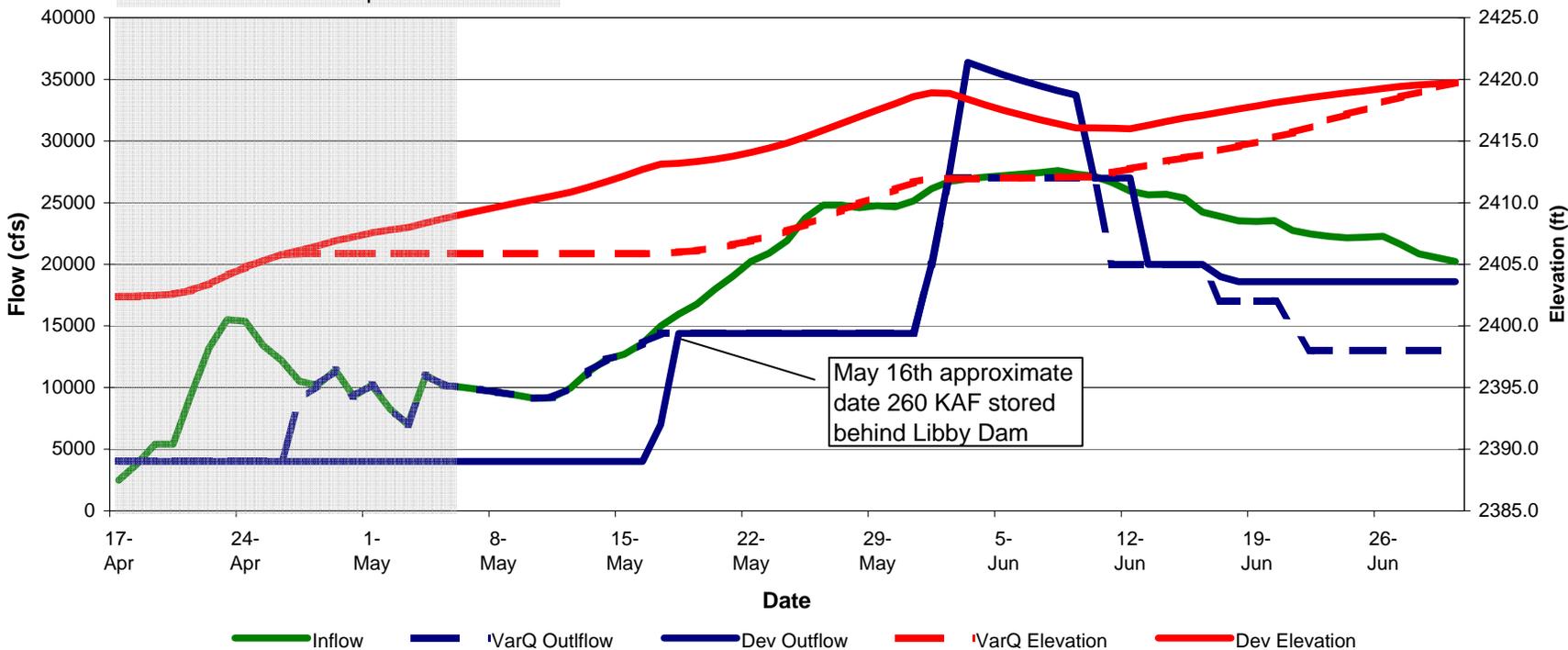
- i. [April %TDG Summary](#)
- 8. Other
 - a. Set agenda and date for next meeting - **May 12, 2010**
 - b. [\[Calendar 2010\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

Libby Dam Deviation Request Accounting

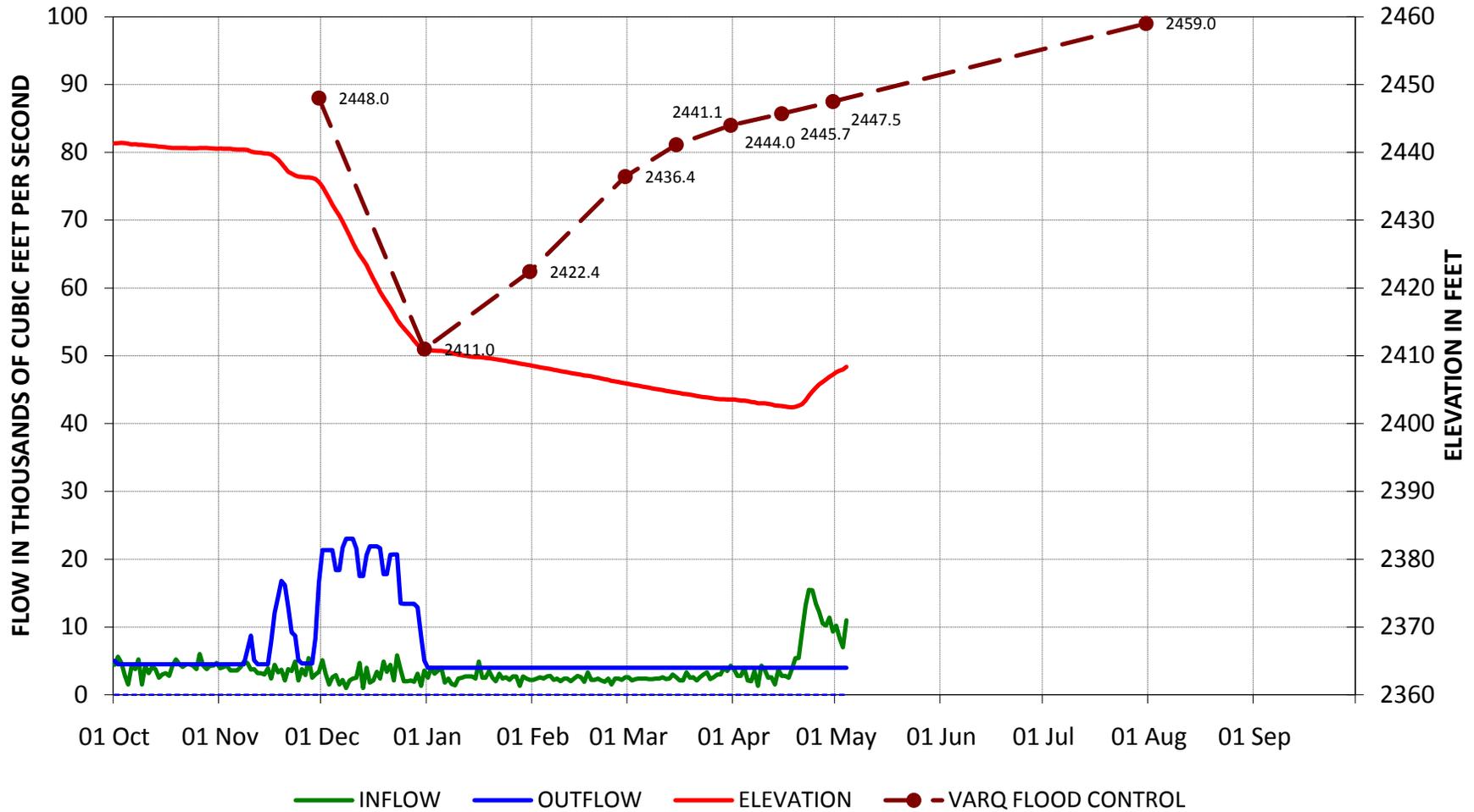


Shaded Area shows operations to date



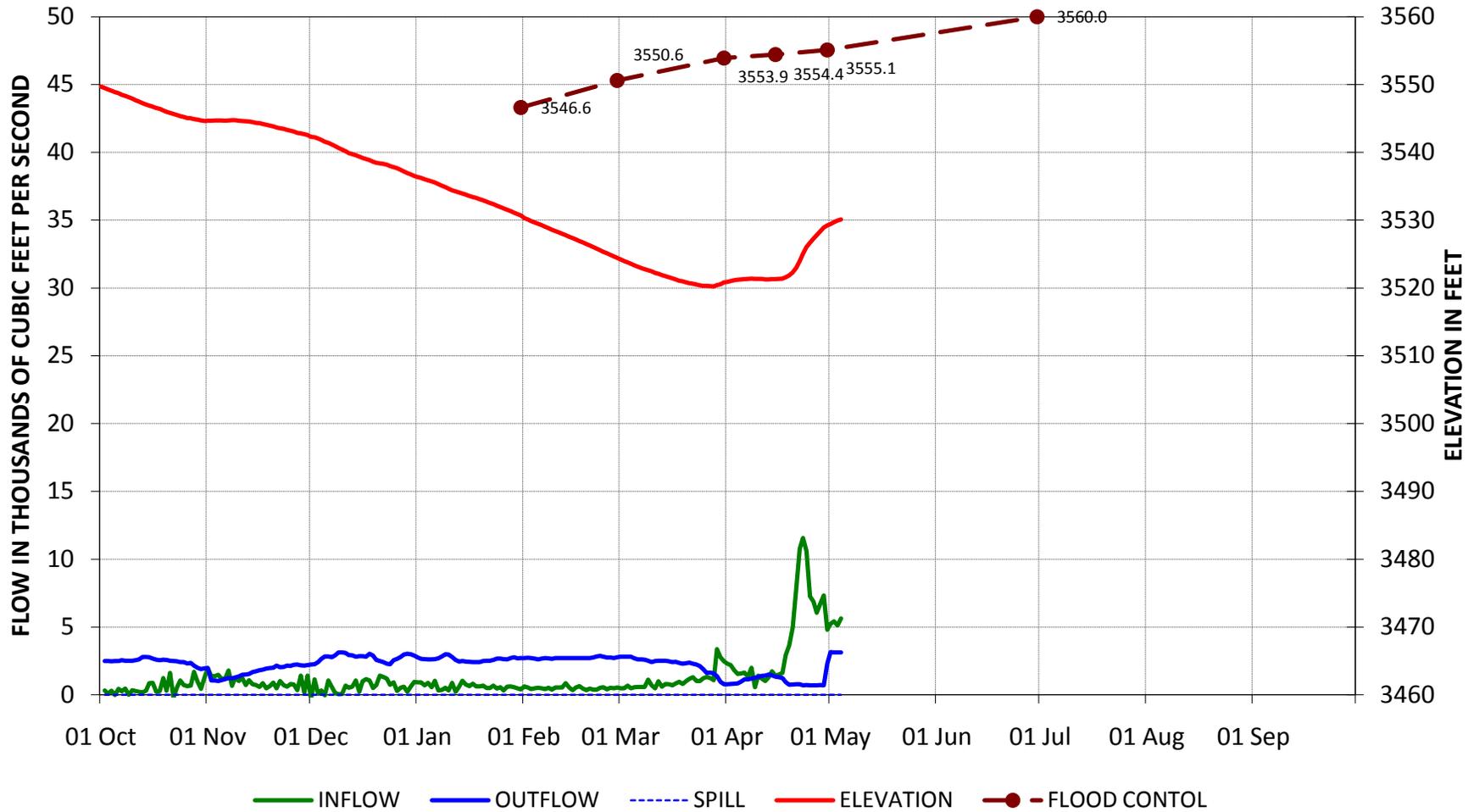
LIBBY DAM AND RESERVOIR

Water Year 2010



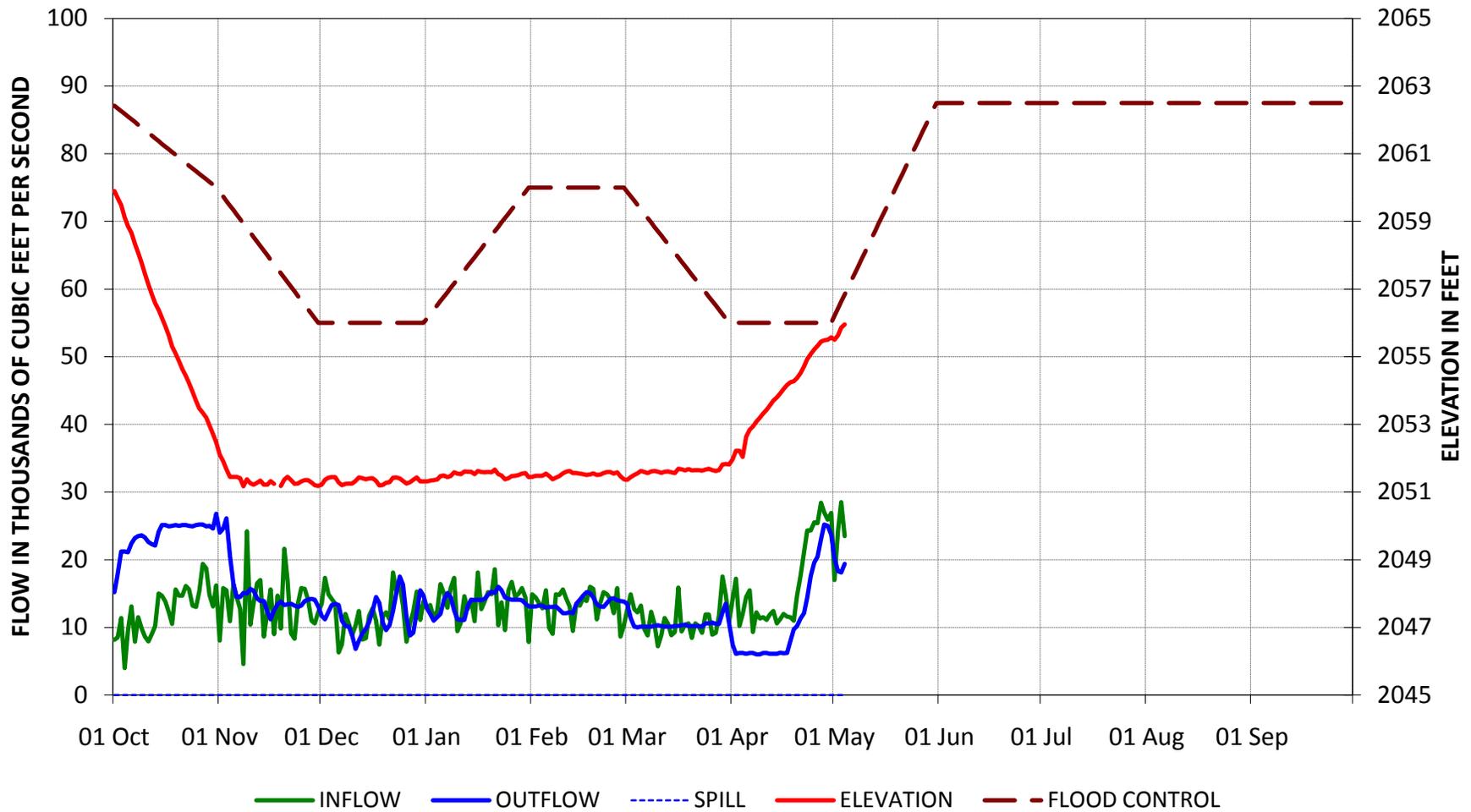
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



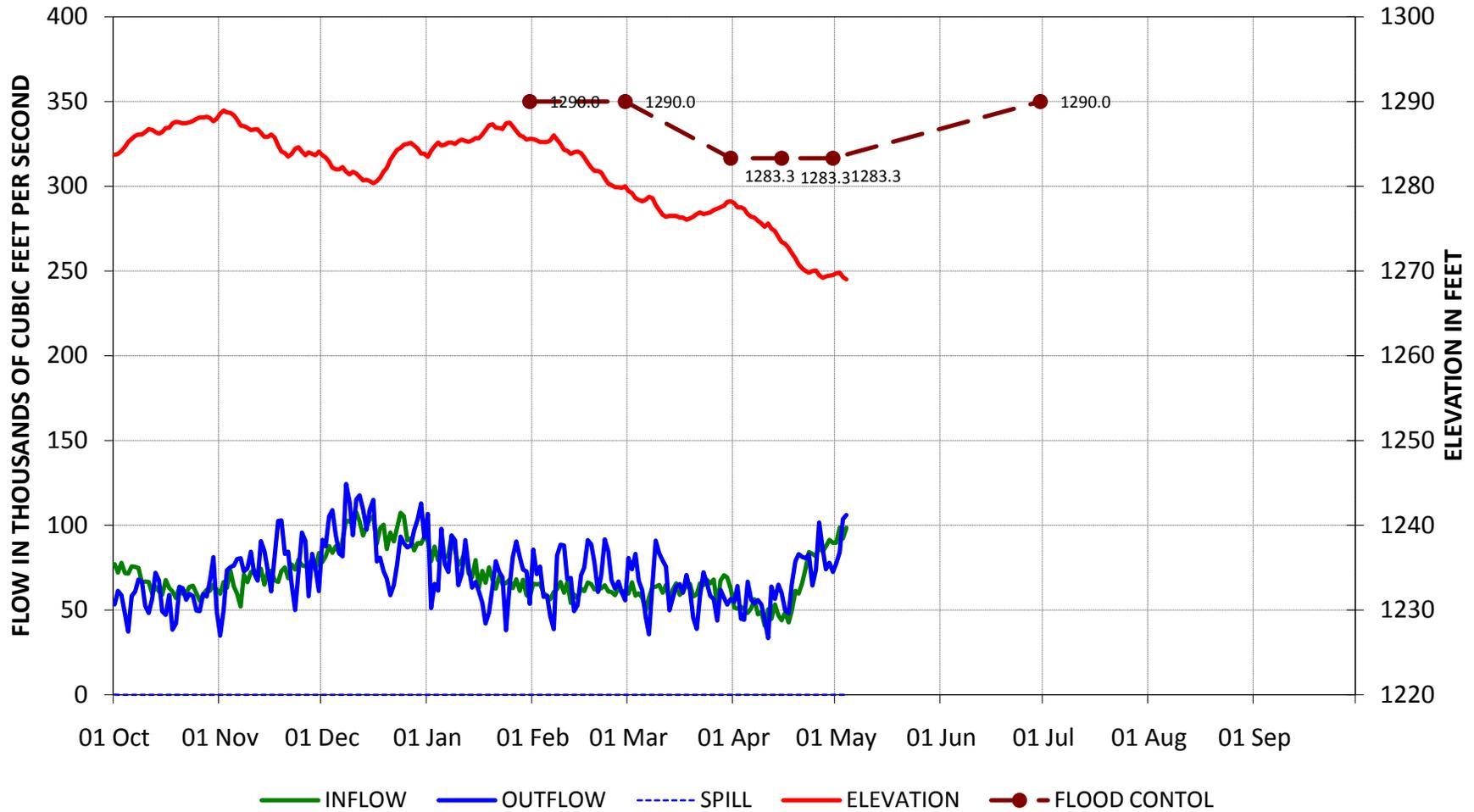
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



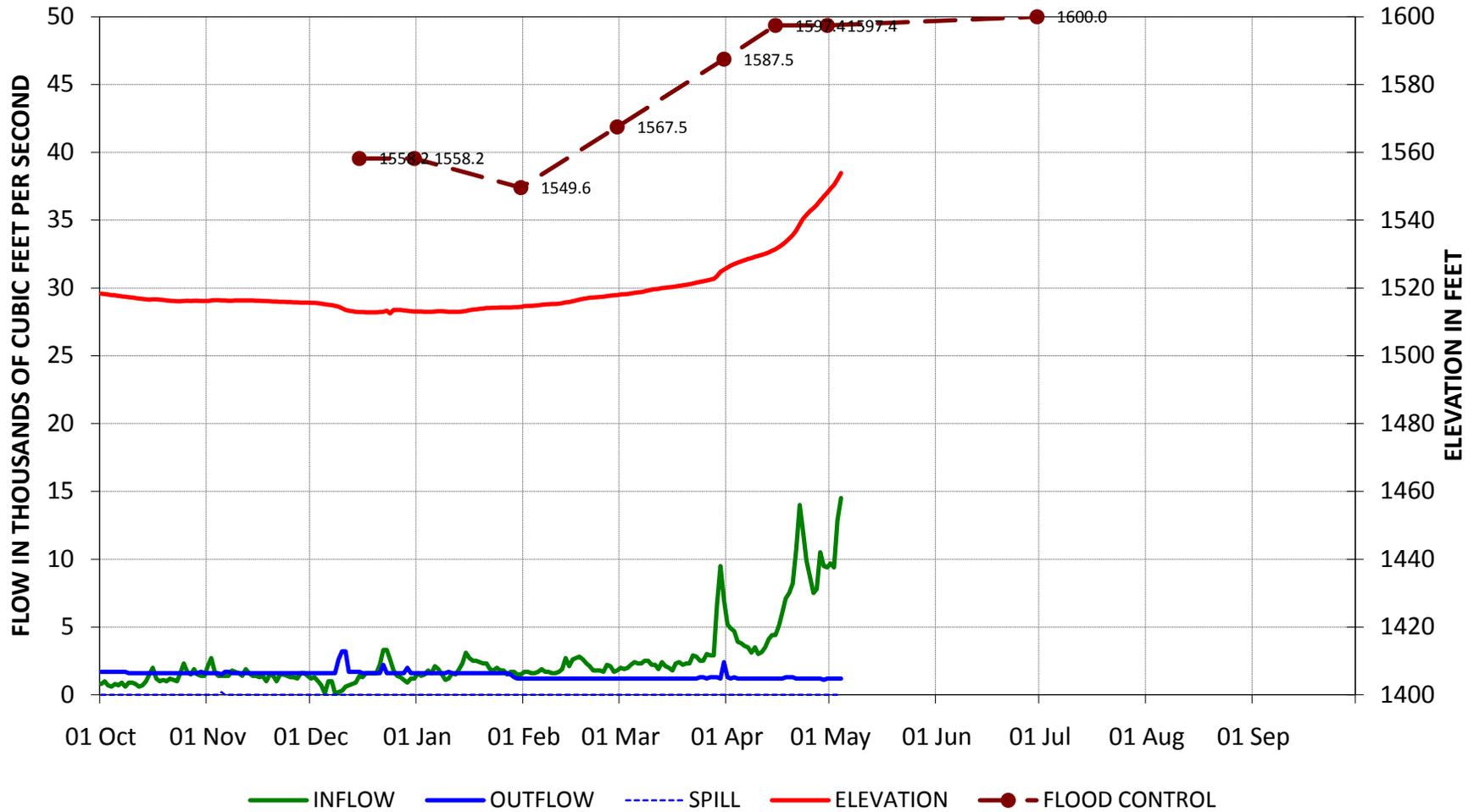
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



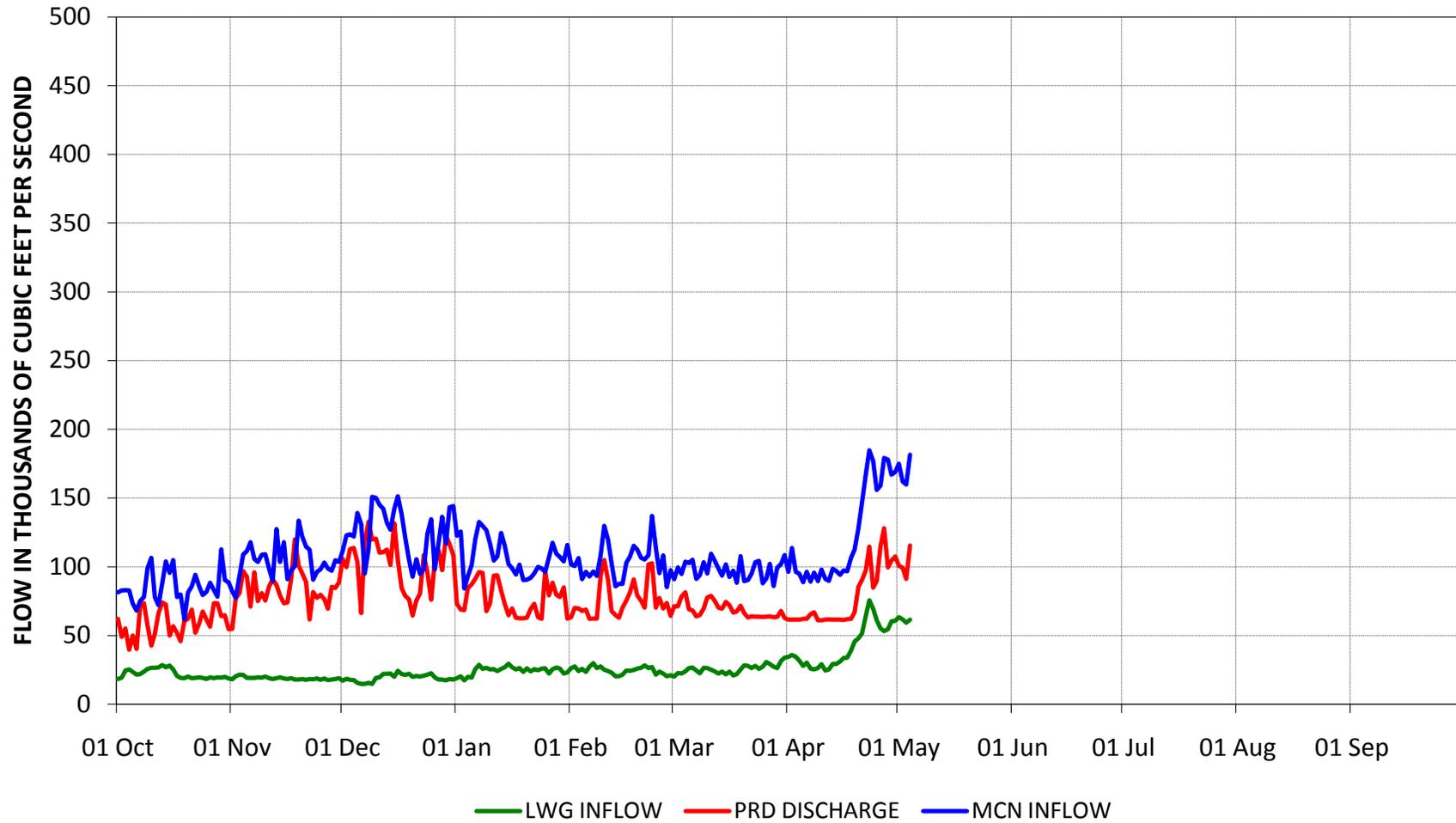
DWORSHAK DAM AND RESERVOIR

Water Year 2010



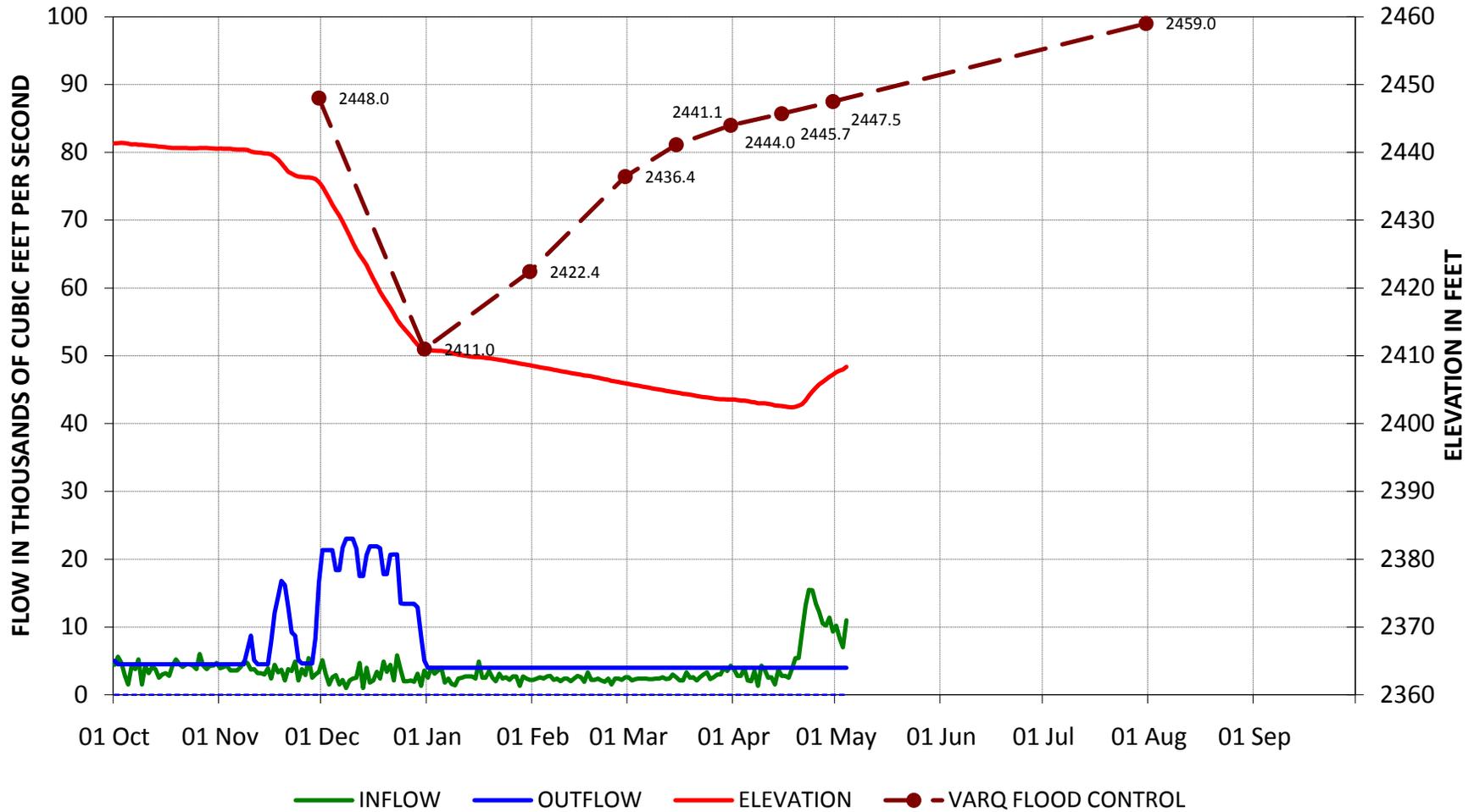
LOWER SNAKE AND LOWER COLUMBIA RIVER FLOWS

Water Year 2010



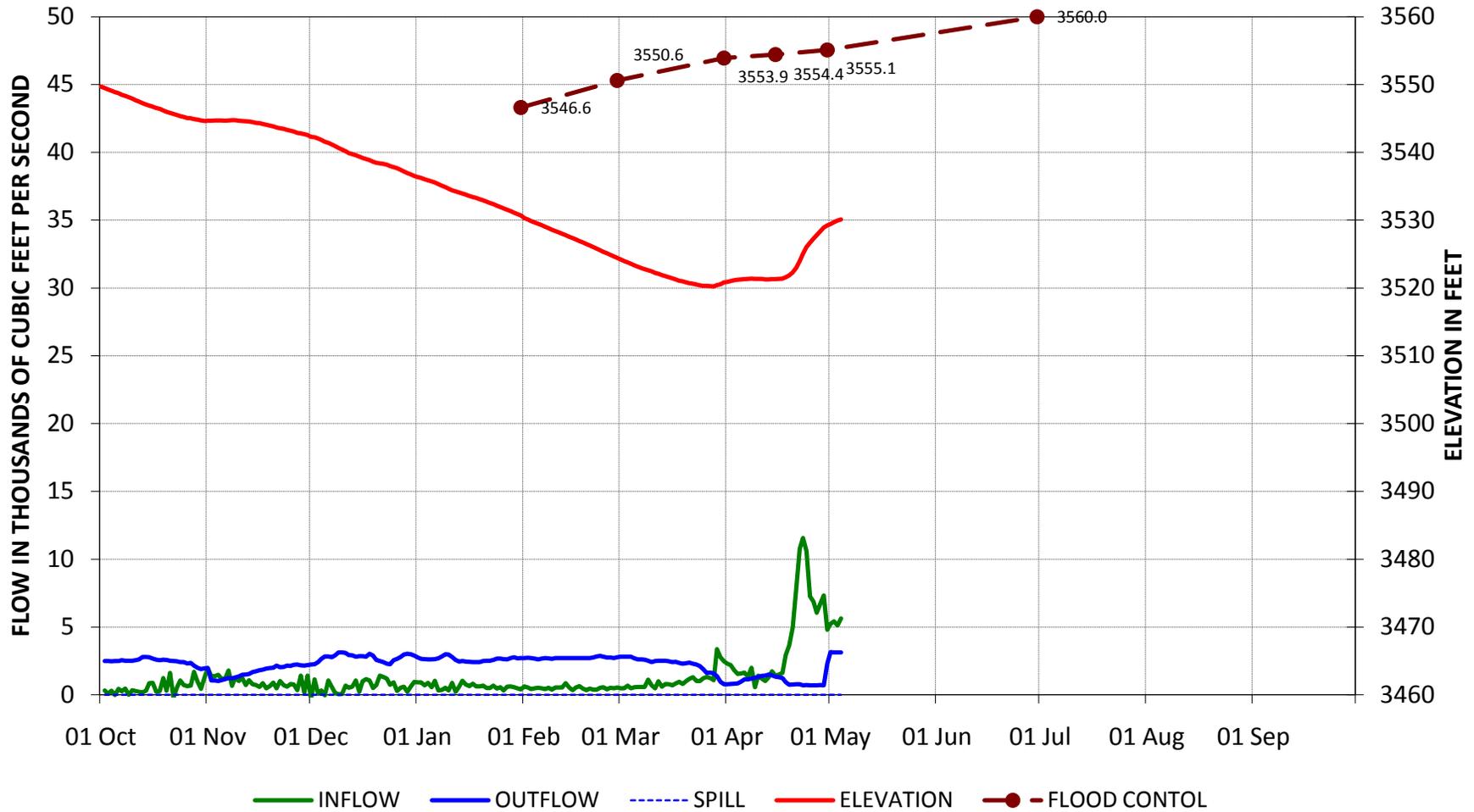
LIBBY DAM AND RESERVOIR

Water Year 2010



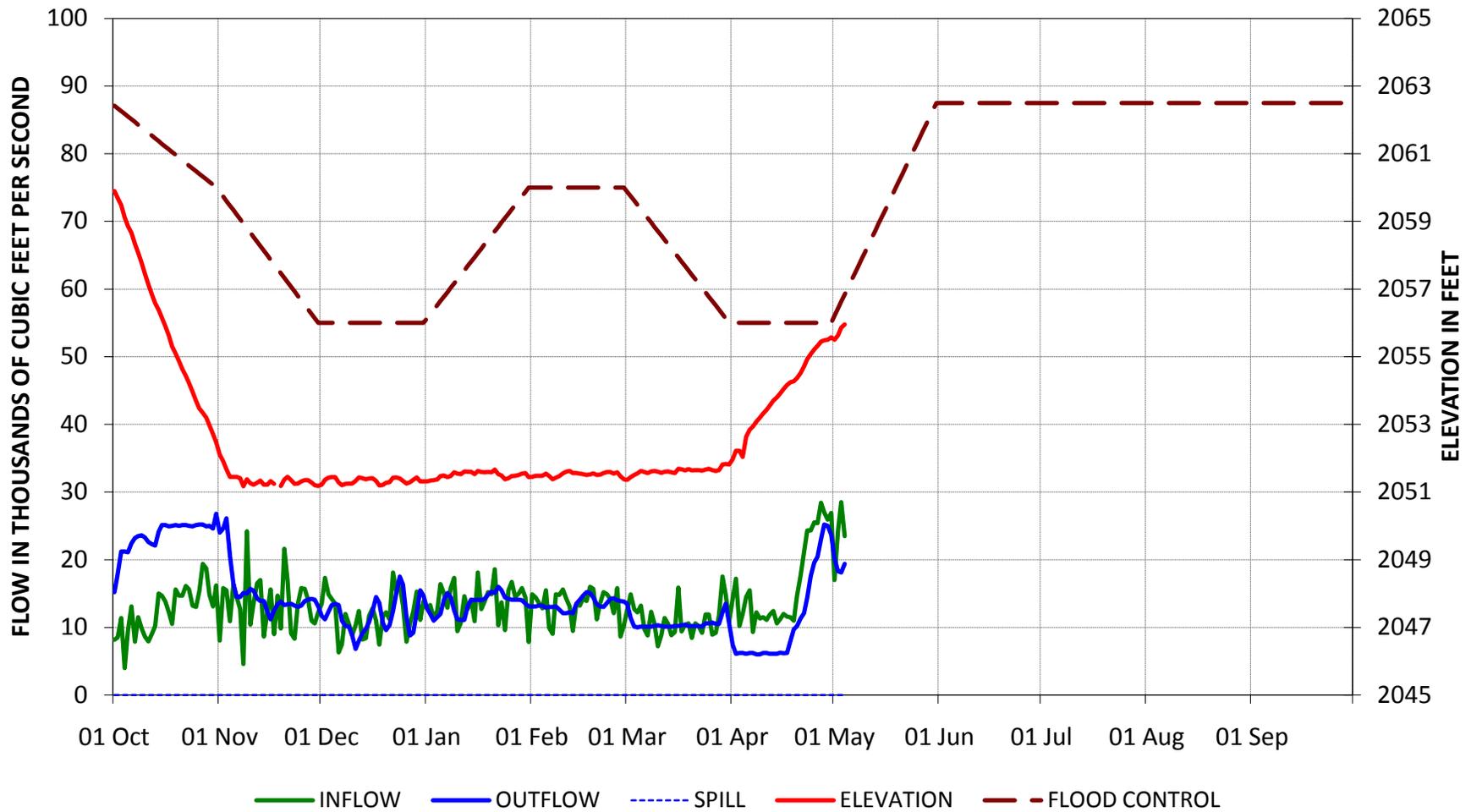
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



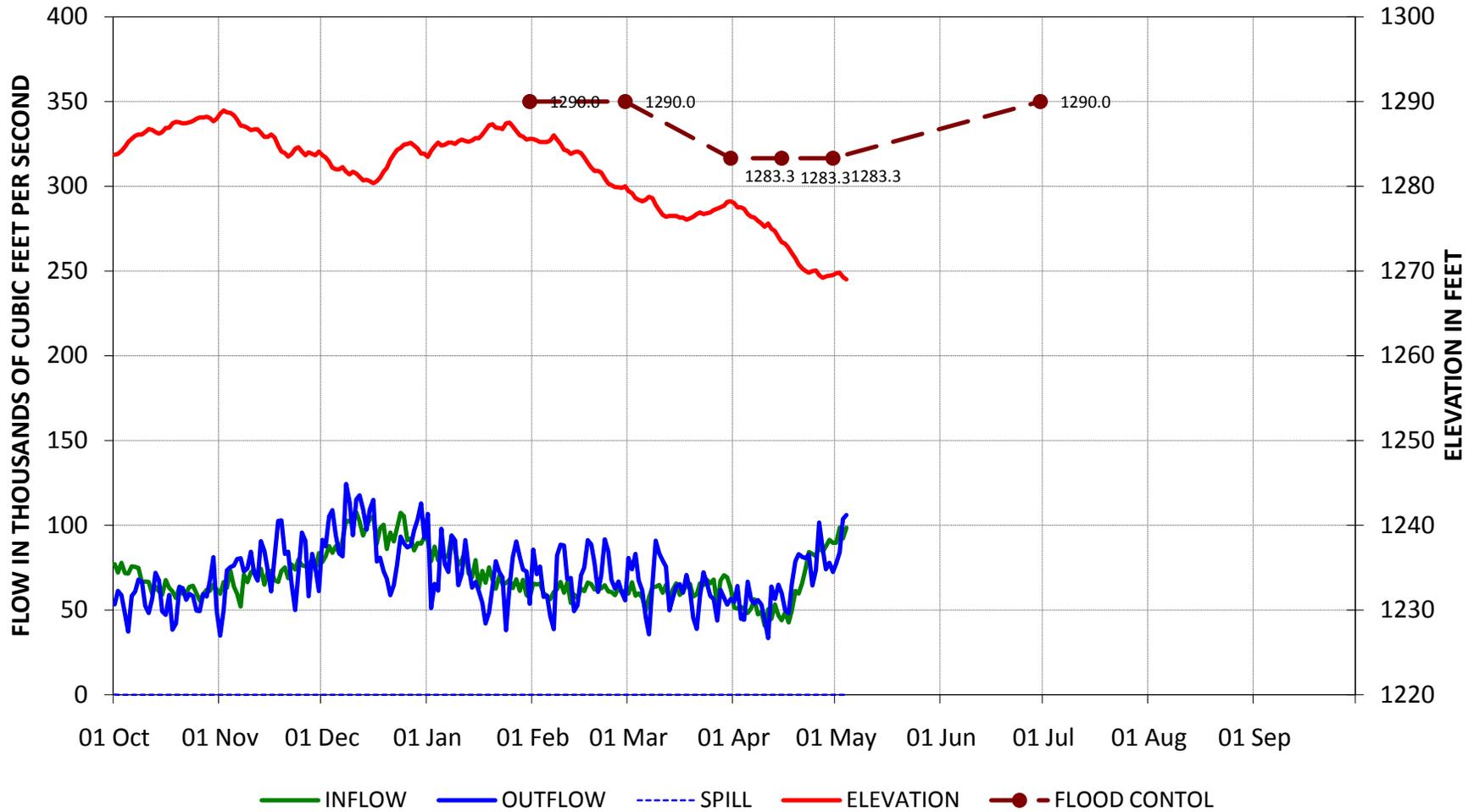
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



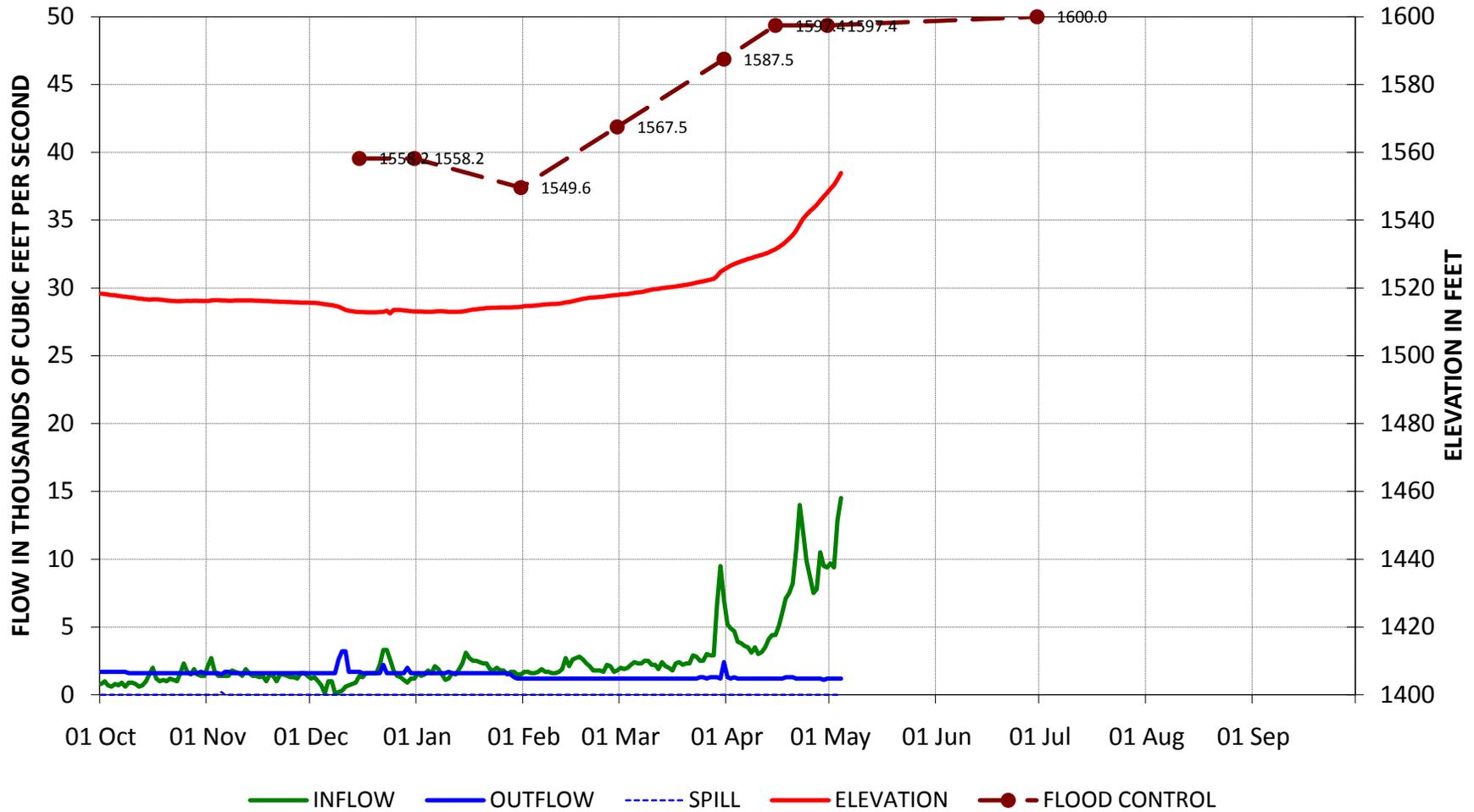
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



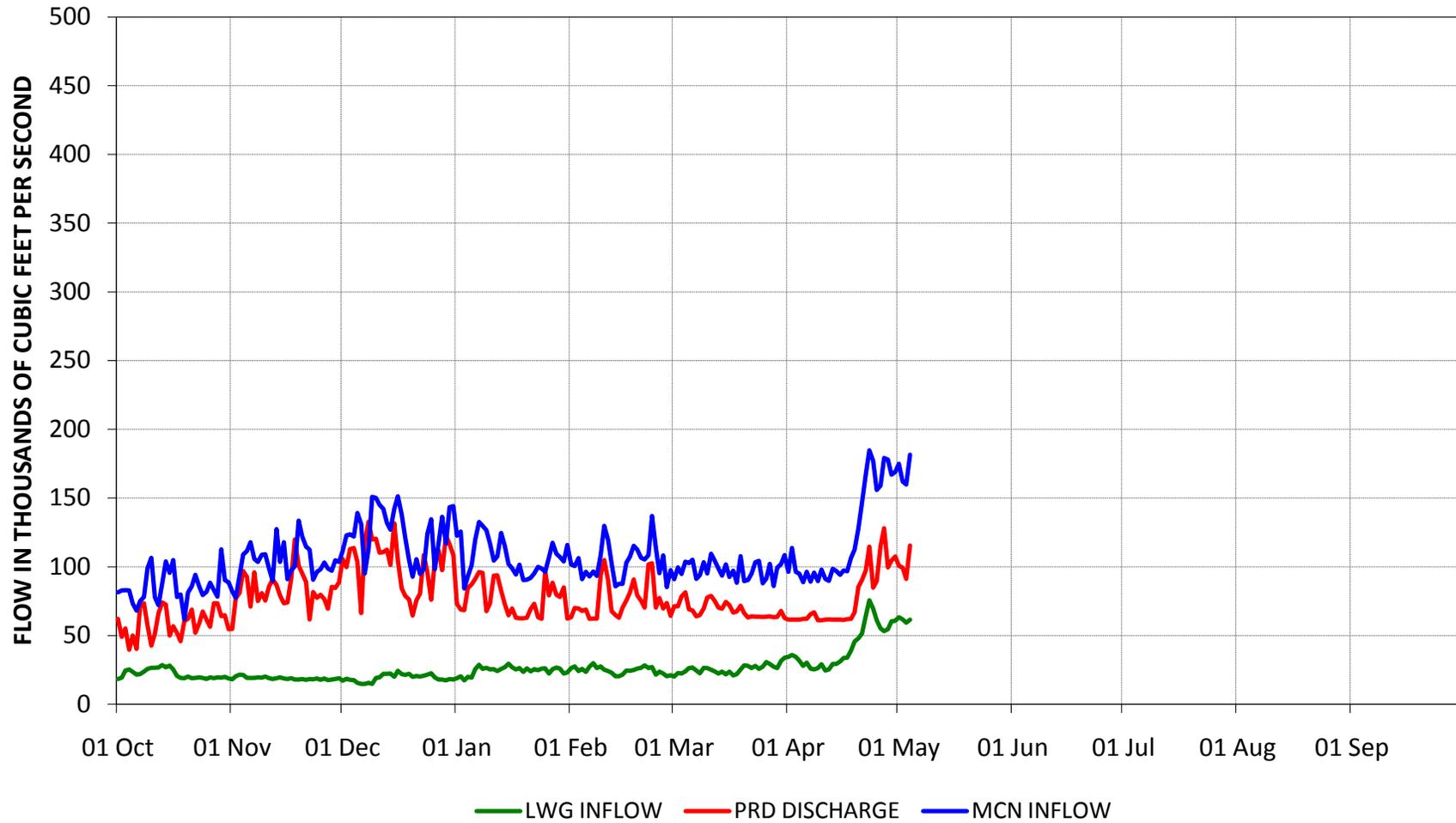
DWORSHAK DAM AND RESERVOIR

Water Year 2010



LOWER SNAKE AND LOWER COLUMBIA RIVER FLOWS

Water Year 2010



TDG INSTANCE TYPES

April 1 – April 30, 2010

This report provides the regionally approved type of percent TDG Instances. In order to provide the above information, the Corps has developed the following list of reasons that exceedances (or instances) occur. This report also includes the TDG instances that occurred in the April 2010 spill for fish passage season. The 2010 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 high 12-hour average calculation method are used to manage spill.

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 from the 2006 Roll-Over.

The Corps 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/201004.html

Washington: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/wa/201004.html

Comparison of OR & WA: http://www.nwd-wc.usace.army.mil/ftppub/water_quality/12hr/201004.html

The necessary reporting details are:

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.

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:
	<ul style="list-style-type: none"> • 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:
	<ul style="list-style-type: none"> • 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:
	<ul style="list-style-type: none"> • 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.

Exceedances are shown on the following table for April 1 to April 30, 2010.

TYPES OF TDG INSTANCES

For April 2010

DATE	Lower Granite	Lower Granite	Little Goose	Little Goose	Lower Monum.	Lower Monum.	Ice Harbor	Ice Harbor	McNary	McNary	John Day	John Day	The Dalles	The Dalles	Bonn	Bonn	Camas
	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay	Tailrace	Forebay
4/3/10	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins	Spill Begins									
4/4/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/5/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/6/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/7/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/8/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/9/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/10/10	---	---	---	---	---	---	---	---	Spill Begins								
4/11/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/12/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/13/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/14/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/15/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/16/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/17/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3
4/18/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
4/19/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
4/20/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	3
4/21/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	---	---	---
4/22/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/23/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/24/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/25/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/26/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/27/10	---	---	---	---	---	---	3	---	---	---	---	---	---	---	3	---	3
4/28/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/29/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4/30/10	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	0	0	0	0	0	0	5	0	1	0	10						

APRIL GRAND TOTAL = 16

COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

May 5, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 April 21 & 28, 2010

Rick Kruger, OR, and Joel Fenolio, COE, both said they emailed edits to the April 4/28 facilitators summary in the Libby Operations section. David Wills, USFWS, clarified that in the Spring Creek Hatchery section of the facilitator's notes, 4.65 *million* fish were released. Paul Wagner, NOAA, asked the COE to clarify unclear language on page six of the 4/21 official meeting minutes, where it was stated that "Alternative 1 would result in a 97% decrease."

Action/Next Steps: DS Consulting will send the COE a revised version of the 4/28 summary and the COE will clarify language in the 4/21 official minutes and post updated versions of those sets of notes to the web. Both sets of the April 28th notes will be finalized at the next TMT face to face meeting, scheduled for May 26th.

Updated Weather and Flood Control Forecasts

Steve Barton, COE, reported to TMT that the River Forecasting Center's May early bird water supply forecast was released on 4/29. It showed that conditions basin-wide are down very slightly with the water supply being at 64% of normal at The Dalles (Jan-July), 73% at Grand Coulee (April- Sept). Snake River projects had increased slightly, with Lower Granite at 55% of normal (April- July.) The COE also reported that the unofficial (still being reviewed for quality control) water supply forecast for Libby was estimated at 4880 KAF, 57% of normal (April-July). (Directly following the TMT meeting, the official forecast became available and showed 4887'.) A "Tier 2" year was officially declared indicating an 800 KAF Sturgeon pulse and up to a 10 kcfs spill associated with that.

Action/Next Steps: This agenda item will be revisited as necessary.

Libby Operations

Steve Barton, COE, shared with TMT that after last week's official polling on Libby Phase II, Alternative I, he reached out to those sovereigns not in attendance for their thoughts/ positions on the matter. He reported that all parties that responded had no objection to, or were in support of the "Alternative 1" operations. Barton said several members echoed Montana's call to revisit the operation on an ongoing basis to re-evaluate the final June target.

Barton then directed TMT to two graphs (posted in one link to the agenda) that tracks the storage accounting based on actual volume and flows over the past week. Joel Fenolio, COE, walked TMT through this modeling data, noting that 88 KAF had been stored thus far and adding that the storage is expected to reach 260 KAF by 5/16. The group asked clarifying questions regarding KAF numbers and VarQ flows. Barton also noted that any forthcoming SORs for Sturgeon Pulse will effect operations as well.

Action/Next Steps: Fenolio will update the storage links each week by Tuesday am, so the Salmon Managers can review the latest data at their FPAC meetings. This agenda item will be revisited weekly.

Water Management Plan Spring/ Summer Update

Steve Barton, COE, reported back to TMT that comments from MT and BOR have been received, reviewed and posted by the COE. USFWS and NOAA said their comments would be sent over in the next day or two. Doug Baus, COE, noted that they'd like more comments and walked TMT through where a copy of the latest draft can be found and downloaded from the TMT site. Several Salmon Managers mentioned that they will submit their final edits over the next two days. The group discussed how best to date the document so that the most recent version can always be easily found. Baus will update the documents as suggested.

Action/Next Steps: Barton asked that suggested changes be submitted to Doug Baus, COE, in track changes. The drop dead date for submissions is this Friday 5/7 by C.O.B. After taking the following week to review and incorporate all comments, the COE will publish the final plan by 5/15. Barton offered that folks may contact him should they have any issues meeting the above deadlines.

Priest Rapids Flow Objectives

Tom Lorz, CRITFC, reported that FPAC discussed the objective and their recommendation was to shift next week's average flow target to 135 kcfs. BPA and the COE both responded that they can meet the request, and John Roache, BOR, said that based on the latest STP, the Action Agencies can operate the project at 135 kcfs and still meet draft rate criteria at Grand Coulee. Paul Wagner, NOAA, said that the 135 kcfs operation should work well for where the fish are at this stage in their migration. Wagner said he noticed the pools at Vernita Bar were drafted to their bottom on 5/2; Tony Norris, BOA, clarified that is typical for the end of the week, with refill on Mondays.

Action/Next Steps: Priest Rapids flows will be increased next week, with a weekly average target of 135 kcfs. Wagner will update TMT on these operations at the next TMT meeting on 5/12.

Operations Review

Reservoirs: Grand Coulee was at elevation 1269' and meeting Priest Rapids objectives of 110 kcfs. Hungry Horse was at 3530.13', with 4 kcfs outflows and filling slightly. Libby was at 2408.35' with inflows of 11 and outflows of 4 kcfs. Albeni Falls was at 2055.95' with inflows of 23.5 kcfs, and outflows of 19.4 kcfs. Dworshak was at elevation 1553.86' with inflows of 14.5 kcfs and outflows of 1.2 kcfs. Steve Hall, COE, noted that the current water supply forecast released 5/1 shows a 68% probability of Dworshak meeting refill. Hall cautioned that the forecast is calling for little precipitation and so the situation could change quickly. Priest Rapids had 115.5 kcfs outflows, Lower Granite had

61.5 kcfs outflows and McNary had 180 kcfs outflows. TMT members discussed the merits of reporting in and outflow data and what the best way is to present the data. Jim Litchfield, OR, and Rick Kruger, OR, noted that updates at TMT should be consistent with what the current requirements the BiOp - unless otherwise requested.

Fish: Paul Wagner, NOAA, reported on adult passage: adult passage at Bonneville was in the 9,000 per day range this week, with 135,000 Spring Chinook at Bonneville for the year, above the ten year average. Regarding smolt data, Wagner directed TMT to the two week passage index on the Fish Passage Center Site. Lower Granite tracking historically well, 143,000-58,000 (66,000 yesterday). Transportation collection began at Little Goose and was scheduled to begin on 5/5 at Lower Monumental. Sampling data revealed 130,000-60,000 and 5,000 (low) respectively at the two projects. Yearling Chinook are tracking 96,000 at McNary, 31,000 at John Day and 5,000 at Bonneville. Steelhead have been light at 77,000-48,000 (averaging 55,000). After transportation at Little Goose, numbers dropped quickly from 153,000 to 25,000. Lower Monumental had 15,000. Mid Columbia projects were inline with historical expectations; 36,000 at McNary, 20,000 at John Day, 24,000 at Bonneville. McNary had 18,000 Sockeye- also inline with the historical expectations. TMT looked at smolt passage data (Wagner noted most fish are from the hatchery releases): Lower Granite Yearling Chinook are within the range of expectations and Steelhead are lagging behind the 10 year average. Wagner then directed TMT to DART data; Steelhead smolts are passage tracking close to the 10 year average at Rock Island, McNary, John Day and Bonneville.

Power: Tony Norris, BPA, referred TMT to the wind generation data, noting that the last week was a very active period, with generation staying high for 7-8 days.

Water Quality: Scott English, COE, shared with TMT that the April Water Quality Report for the Lower Columbia and Snake Rivers has been posted to the TMT web page. 16 TDG instances were reported for the month, of which most were Type 3 instances at the Camas/ Washougal gauge (most likely attributed to temperature changes of 1.5 degrees.) He reported that all TDG stations are currently working properly.

The next TMT meeting will be: conference call on 5/12 at 9:00 am.

Agenda items will include:

- Hanford Reach Update
- Libby Operations Update
- Priest Rapids Update
- Water Management Plan Comments Update

Future TMT meeting schedule:

5/19 - conference call

5/26 - face to face- location TBD.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 5, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the COE, NOAA, Oregon, BPA, Montana, USFWS, Washington, Idaho, BOR, 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 provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for April 21 and 28

There were changes to the April 21 official minutes and to the April 28 facilitator's notes; these will be revised and re-posted to the TMT web page. TMT will review the April 28 official minutes at the next TMT meeting. Changes are:

April 21 official minutes:

- Libby operations, page 6, last paragraph: Paul Wagner (NOAA) pointed out the minutes currently say, "...the Kootenai Lake data shows a 97% decrease in flows released from Kootenai Lake under Alternative 1 and a 96% decrease under Alternative 2." Steve Barton (COE) will provide amended language.

April 28 facilitator's notes:

- Libby operations, bottom of page 2: Doug Baus (COE) reported that Joel Fenolio (COE) requested language be added to clarify that the COE is committed to releasing the additional 260 kaf of stored volume by June 30. The COE will revise the notes accordingly.
- Spring Creek Hatchery update, page 5: Dave Wills (USFWS) will provide amended language for, "...the May release from the Spring Creek Hatchery is scheduled for 5/10 with 4.65 fish planned for release."

3. Updated Weather and Flood Control Forecasts

The RFC early bird May water supply forecast was issued April 29, Barton reported. All forecasts are down except in the Snake River. The volume forecasts are as follows:

- The Dalles, January-July – 64% of average, or 68.6 maf. April-August – also 64% of average, or 59.7 maf, a 200 kaf decrease from the previous forecast.
- Grand Coulee, April-September – 73% of average, or 46.6 maf, a 500 kaf decrease from the previous forecast.
- Lower Granite, April-July – 55% of average, or 11.9 maf, a 200 kaf decrease from the previous forecast.

The COE official water supply forecast for Dworshak is up slightly, with a 1,526 kaf forecast, or 57% of average. The COE official forecast for Libby, released at the end of today's meeting, is 4,887 kaf with a forebay elevation that's 3.5-4 feet higher than it would have been without the Phase 1 alternative operation. This makes 2010 a Tier 2 year with an 800 kaf sturgeon pulse at Libby (see item 5 below for further discussion of Libby operations).

4. Hanford Reach Update

This item was postponed until the May 12 conference call.

5. Libby Operations

After polling all sovereigns regarding Libby operations this year, the COE found either no objection or support for Alternative 1 under Phase 2 – as long as the Libby elevation target for the end of June is closely monitored. The COE concurs with Montana's request to keep Libby operations on the TMT agenda throughout spring and summer. Several parties have expressed concern about a potential steep drop-off in June once the sturgeon volume is exhausted. The situation will become clearer when the sturgeon SOR is available. The COE wants to remain flexible and to avoid steep drop-offs in Libby outflows. Montana expressed appreciation for this approach.

To provide an update on Libby, Joel Fenolio (COE Seattle) walked TMT through two graphs attached to this item on today's agenda. Based on STP single-trace inflow projections, the bottom graph shows actual Libby operations to date and the likely operation throughout summer. An estimated 88 kaf would have been stored in Libby reservoir to date if the COE had not proposed and TMT approved Phase 1 of the alternative operation. If the Phase 2 deviation request is likewise supported via TMT consensus, the COE expects a total of 260 kaf will be stored in Libby by May 16. The 260 kaf would then be released around the sturgeon pulse.

The current VARQ discharge is 14.5 kcfs, Fenolio reported. The COE is now accounting for the volume difference between inflows and 4 kcfs minimum flows. Volume stored up to this point will be shaped with Phase 1 outflows. Phase 1 storage will be rolled into Phase 2.

The graph attached to today's agenda shows actual inflows to date and projected inflow volumes under the VARQ operation vs. the deviation request for Phase 2. It also shows actual and projected elevations under the VARQ operation vs. the deviation request. Fenolio will update this graph by 9 am Tuesdays so the Salmon Managers will have the latest information on Libby available for FPAC meetings, and TMT members will have time to review the information before meeting on Wednesday. Fenolio said he'll use colored graphics to sharpen the distinction between actual and projected inflows.

For the rest of the 2010 passage season, the COE will post updated water supply forecasts for Libby to the TMT page and email them directly to TMT members. The May final inflow forecast for Libby, released just as TMT disbanded today, is 4,887 kaf. TMT will revisit Libby operations on May 12 and weekly thereafter.

6. Water Management Plan – Spring/Summer Update

The COE has received comments from Montana on the spring/summer update, which are posted to the TMT page under the Water Management Plan link. Comments from the BOR have been integrated into the update as well. Doug Baus (COE) solicited more comments from TMT members. The final deadline is May 7, driven by the BiOp deadline of May 14 for posting the final spring/summer update.

TMT briefly discussed how to list the dates for ongoing drafts of "living" documents such as the WMP spring/summer update that are posted to the web for comments. There was general agreement to use the TMT minutes as an official record that BiOp deadlines were met, and to use the WMP postings as a way for TMT members to make sure they're commenting on the current version of the document. In future, the date listed to the right of the comment link will be the date on the title of the document that was reviewed.

Tony Norris (BPA) volunteered to reorganize the TMT web page this fall so it's more interactive. He'll present it for TMT review sometime in September.

7. Priest Rapids Flow Objectives

The flow objective for Priest Rapids is 135 kcfs this week, Tom Lorz (CRITFC) reported. The Action Agencies agreed to support that flow target. Tony Norris said TMT needs to revisit this issue weekly throughout spring and summer. This year we're managing drops of water, trying to make the system perform the best it can for fish. The COE will implement the 135 kcfs flow target. There is some concern about the draft rates at Grand Coulee associated with 135 kcfs releases when inflows are down. The latest STP model run shows that Grand Coulee can probably still meet the draft rate criteria while meeting the 135 kcfs objective at Priest Rapids. John Roache said the BOR will begin releasing flows from Grand Coulee to meet 135 kcfs at Priest Rapids on May 10. By May

16, the reservoir is expected to be at elevation 1,260 feet based on STP traces released May 4. No drastic increases in inflows are expected over the next week. Paul Wagner (NOAA) said 135 kcfs flows at Priest Rapids would mesh well with the needs of mid Columbia fish. Snake River spring Chinook are migrating on schedule, while steelhead migration is lagging.

Discussion turned to stranding that occurred at Vernita Bar this past weekend. The situation was handled better this year than last, Wagner said. The problem is that mid Columbia pools draft to empty Sunday night, and outflows might dwindle until inflows pick up on Monday. This makes it difficult to guarantee the full volume at Priest Rapids. Grant PUD has managed the operation well within the terms of the agreement, Wagner said. TMT will revisit the Priest Rapids flow objective in its conference call May 12.

8. Operations Review

a. Reservoirs. Grand Coulee is at elevation 1,269 feet, meeting the 110 kcfs (weekly average) at Priest Rapids. Hungry Horse is at elevation 3,530.13 feet. It was discharging 3 kcfs last week but releases increased to 4 kcfs this morning based on the latest water supply forecast. Inflows are around 5 kcfs.

Libby is at elevation 2,408.35 feet, with inflows of 11 kcfs and outflows of 4 kcfs. Albeni Falls is at elevation 2,055.95 feet, with inflows of 23.5 kcfs and releases of 19.4 kcfs.

Dworshak is at elevation 1,553.86 feet, about 45 feet from full, with inflows of 14.5 kcfs and outflows of 1.2 kcfs. Based on the May 1 principle components forecast there is a 52% chance of refill and based on the linear regression forecast, Steve Hall estimated a 73% chance that Dworshak reservoir will refill in 2010. Of the 10 years with the closest volumes to this year, five achieved refill and five did not. The worst year on record was 1987, with a maximum Dworshak elevation of 1,587 feet, 13 feet from full. The recent precipitation since the forecast indicate the reservoir now has about a 68% chance of refilling compared to only 52% last week. Inflow increases over the past few days that raised these odds are not likely to continue next week. This time of year is very volatile, with frequent spikes in inflows.

In the mid Columbia, Lower Granite inflows are 61.5 kcfs, having spiked at 70 kcfs. Lower Granite inflows haven't dipped below 50 kcfs since late April. Yesterday Priest Rapids discharged 115.5 kcfs, exceeding the 110 kcfs objective which will soon increase to 135 kcfs. For the week ending May 7, Priest Rapids released 107 kcfs. For the week ending April 25, flows were 98.8 kcfs, exceeding the 90 kcfs objective. McNary inflows are 180 kcfs.

There was discussion of whether it's more important to focus on inflows or outflows in the mid Columbia. Barton said he'll switch the reporting protocol to whatever format best serves TMT's information needs. He pointed out that inflow data give an idea of the resources TMT has to work with. Jim Litchfield

(Montana) favored listing all mid Columbia data in terms of outflows because outflows relate directly to BiOp flow targets for spring and summer. Rick Kruger (Oregon) agreed the reporting format should be consistent with the BiOp's focus. Tony Norris suggested tracking the current weekly averages and seasonal averages to date, in relation to BiOp objectives. Barton will update the reservoir summary plots attached to this agenda item for the next TMT meeting.

b. Fish. Adults: Approximately 7,000 spring Chinook per day have been passing Bonneville this past week with a peak count of 9,000 on May 4, Wagner reported. The yearly count so far is 163,000, which exceeds the 10 year average. Typically spring Chinook migration declines at this time of year, and that's what appears to be happening now. However, the forecast suggests there might be a spectacular return in 2010.

Juveniles: Daily smolt reports on the FPC site indicate the passage at Lower Granite has been tracking well in line with expectations for this date. Counts for the past week ranged from 143,000-58,000 smolts per day, with a count of 66,000 yesterday. Daily transport is underway at Little Goose, with a passage index of 150,000-60,000 fish per day. Transportation began today at Lower Monumental, with 5,000 fish per day, which is low. McNary passage has been tracking closely with historic expectations in terms of passage timing. Passage counts for yearling Chinook are 96,000 at McNary, 31,000 at John Day, and 85,000 at Bonneville.

Juvenile steelhead passage at Lower Granite has been low for the past week at 77,000-48,000 per day. When transportation started at Little Goose, the count rose to 133,000 fish per day, which suggests that fish had been residing in the pool. The count dropped to 25,000 the next day. Current juvenile steelhead counts are 15,000 per day at Lower Monumental, 36,000 at McNary, 20,000 at John Day, and 24,000 at Bonneville. All of these counts are in line with expectations.

Juvenile sockeye passage at McNary has been 18,000 fish per day for the past few days, which is in line with expectations. The FPC smolt website has graphs of cumulative passage data, which Wagner showed to TMT. Lower Granite yearling Chinook passage is within the range of expectations for this time of year. The FPC site confirms that steelhead passage at Lower Granite is lagging. Both Lower Granite and Little Goose had low early steelhead passage counts this year. Passage at Little Goose is in line with expectations. Yearling Chinook passage at Rock Island is following the 10 year average closely. Passage counts at McNary, John Day and Bonneville are all around the 10 year average. All of these index counts are heavily influenced by hatchery releases. Sockeye passage at all the mid Columbia dams is looking very good.

c. Power System. Sustained winds resulted in a week or more of uninterrupted wind energy production, Norris said. Generation was around 2,700 mW, with a capacity of 2,780 mW in BPA's balancing authority area. Wind energy displaces the highest cost resource, starting with gas, then coal, nuclear

and hydro, Litchfield said. Some 80% of the wind generation in BPA's BAA serves loads outside the Northwest. Integrating it into the BPA system is a challenge. The wind energy graph on BPA's web site is updated every 5 minutes.

d. Water Quality. Scott English (COE) showed TMT the updated TDG summary for April. There were a total of 16 TDG exceedances, most at Camas Washougal gage. All were type 3, meaning the exceedance occurred despite best professional judgment. These are attributed to temperature spikes.

11. Next Meeting

The next two TMT meetings will be conference calls May 12 and 19, followed by a meeting in person May 26, possibly at Bonneville Dam or somewhere in Hood River. Agenda items for the May 12 call will include a Hanford reach update, a Libby operations update, Priest Rapids flows objectives, and comments on the WMP spring/summer update.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Paul Wagner	NOAA
Rick Kruger	Oregon
Doug Baus	COE
Tony Norris	BPA
Laura Hamilton	COE
Kim Johnson	COE
Mark Fisher	EDF Trading
Jim Litchfield	Montana
Rob Dies	Iberdrola Renewables
Steve Burrell	COE
David Wills	USFWS
Don Faulkner	COE
Scott English	COE
Karl Kanbergs	COE

Phone:

Charles Morrill	WDFW
Russ Kiefer	Idaho
John Roache	BOR
Tom Lorz	CRITFC
John Hart	EWEB
Steve Hall	COE Walla Walla
Russ George	WMC
Jeremy Giovando	COE
Glen Trager	Shell Energy
Rob Allerman	Deutsch Bank

Richelle Beck
Joel Fenolio

DRA
COE

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Wednesday May 12, 2010 09:00 - 11:00

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for Apr 21,28 and May 5, 2010 [[Meeting Minutes](#)]
3. Hanford Reach Update - *Russell Langshaw, Grant County PUD*
 - a. [Priest Rapids Operations](#)
4. Libby Spring Operations - *Steve Barton, COE-RCC*
 - a. [Storage Accounting](#)
5. Priest Rapids Flow Objectives - *Paul Wagner, NOAA Fisheries*
6. Water Management Plan Spring/Summer Update - *Steve Barton, COE-RCC*
7. Treaty Fishery - *Tom Lorz, CRITFC*
 - a. [SOR 2010-C2](#)
8. Dworshak Operations - *Paul Wagner, NOAA Fisheries*
 - a. [SOR 2010-02](#)
 - b. [Dworshak Refill](#)
9. Ice Harbor Spill Levels - *Russ Kiefer, IDFG*
 - a. [SOR 2010-03](#)
10. Other
 - a. Set agenda and date for next meeting - **May 19, 2010**
 - b. [\[Calendar 2010\]](#)

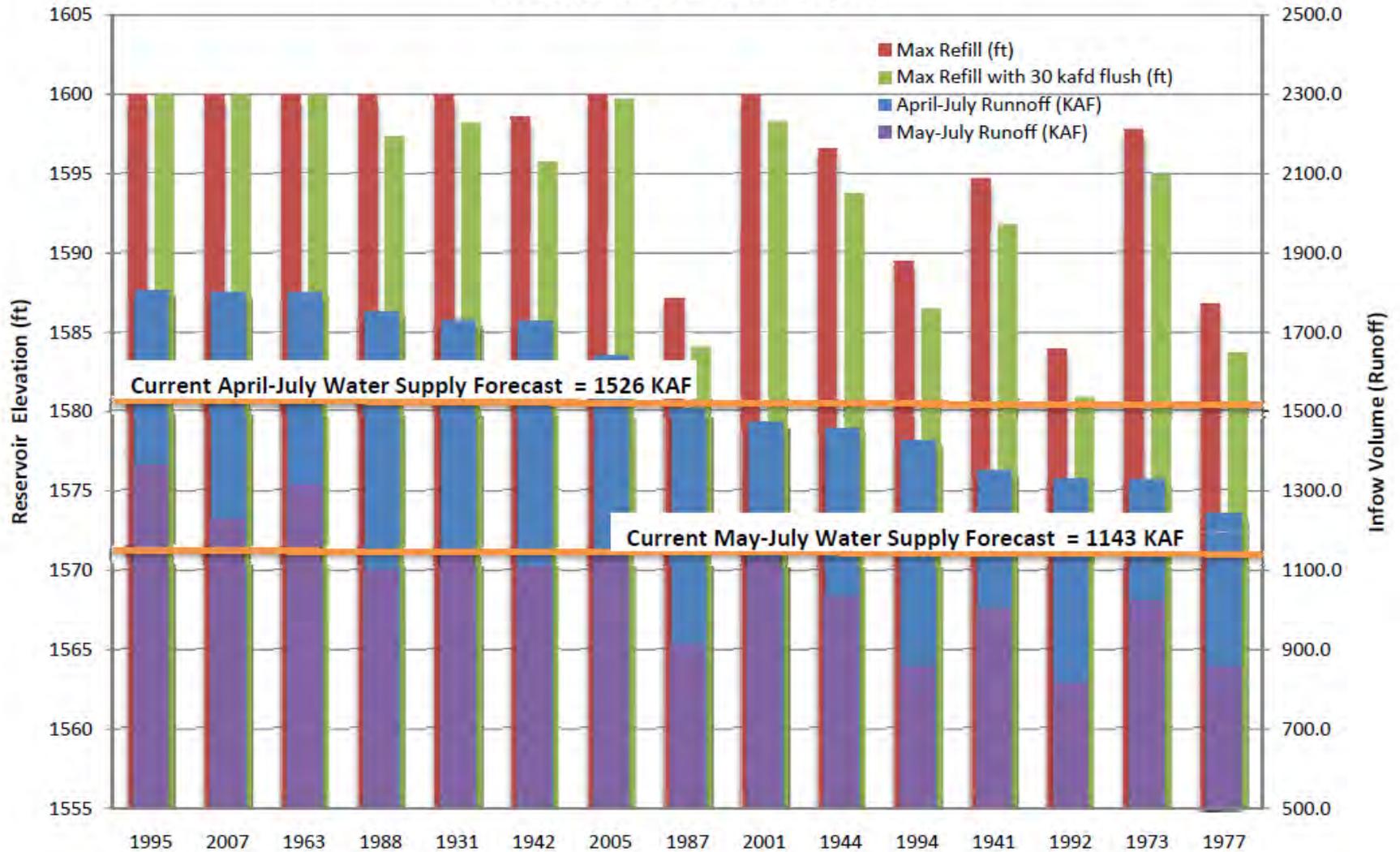
*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

Dworshak Refill Analysis

- Refill Analysis based on 15 years with similar runoff volumes for both April to July and May to July.
- Green and Red bars show maximum pool elevation , Blue and Purple show runoff volume.
- 7 of the 15 would refill to 1600 with a minimum discharge of 1.35 kcfs.
- With a 30 kcf/d pulse (3 days at 10.0 kcfs) 3 of the 15 would refill

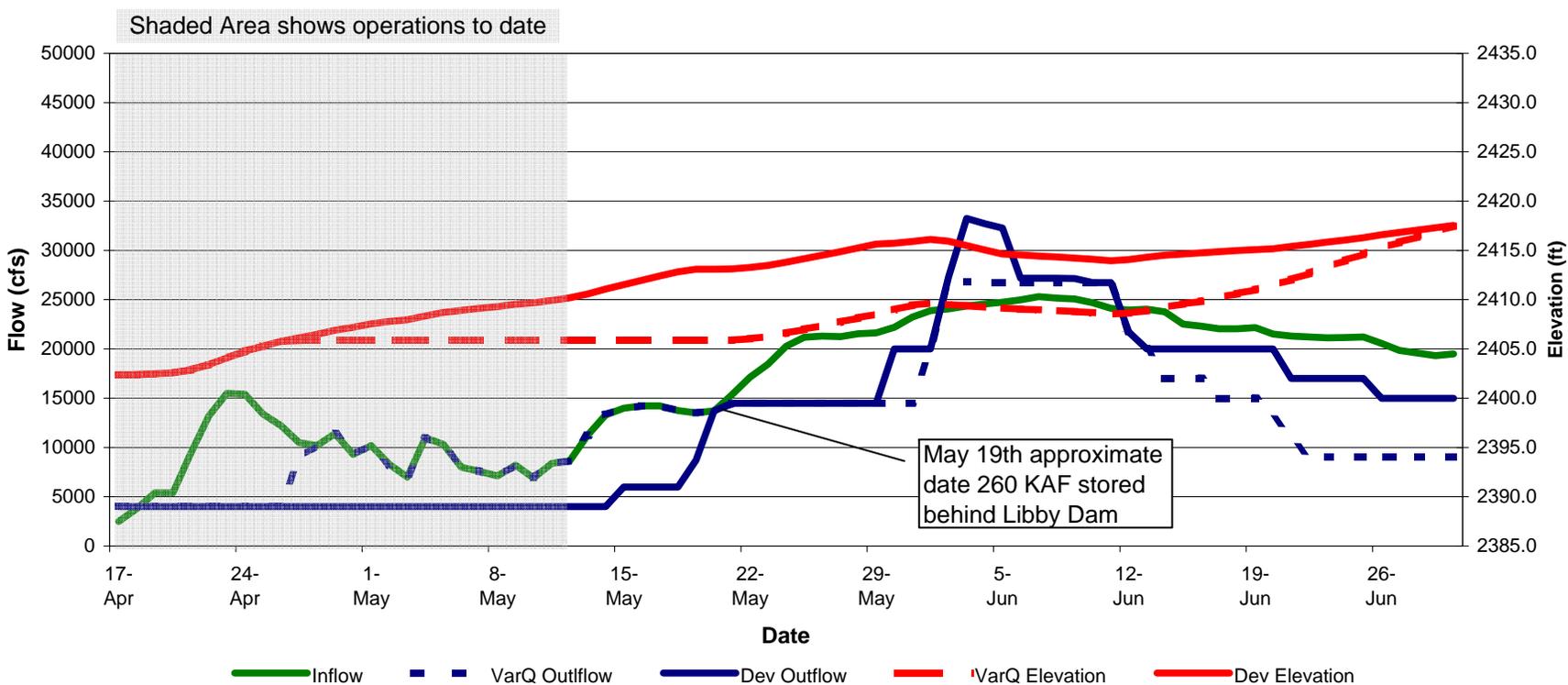
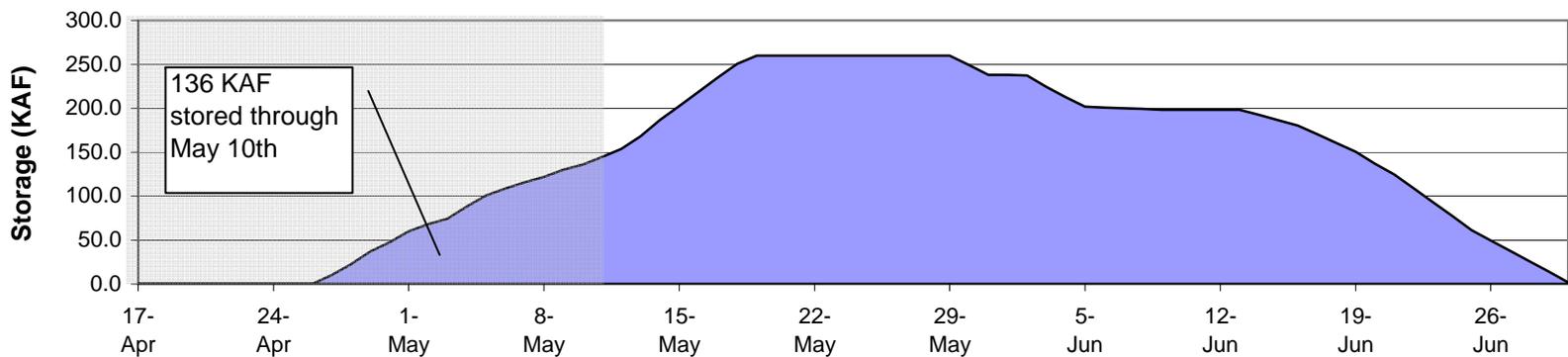


Dworshak Refill Analysis



15 Historical Years Similar to Current Forecast

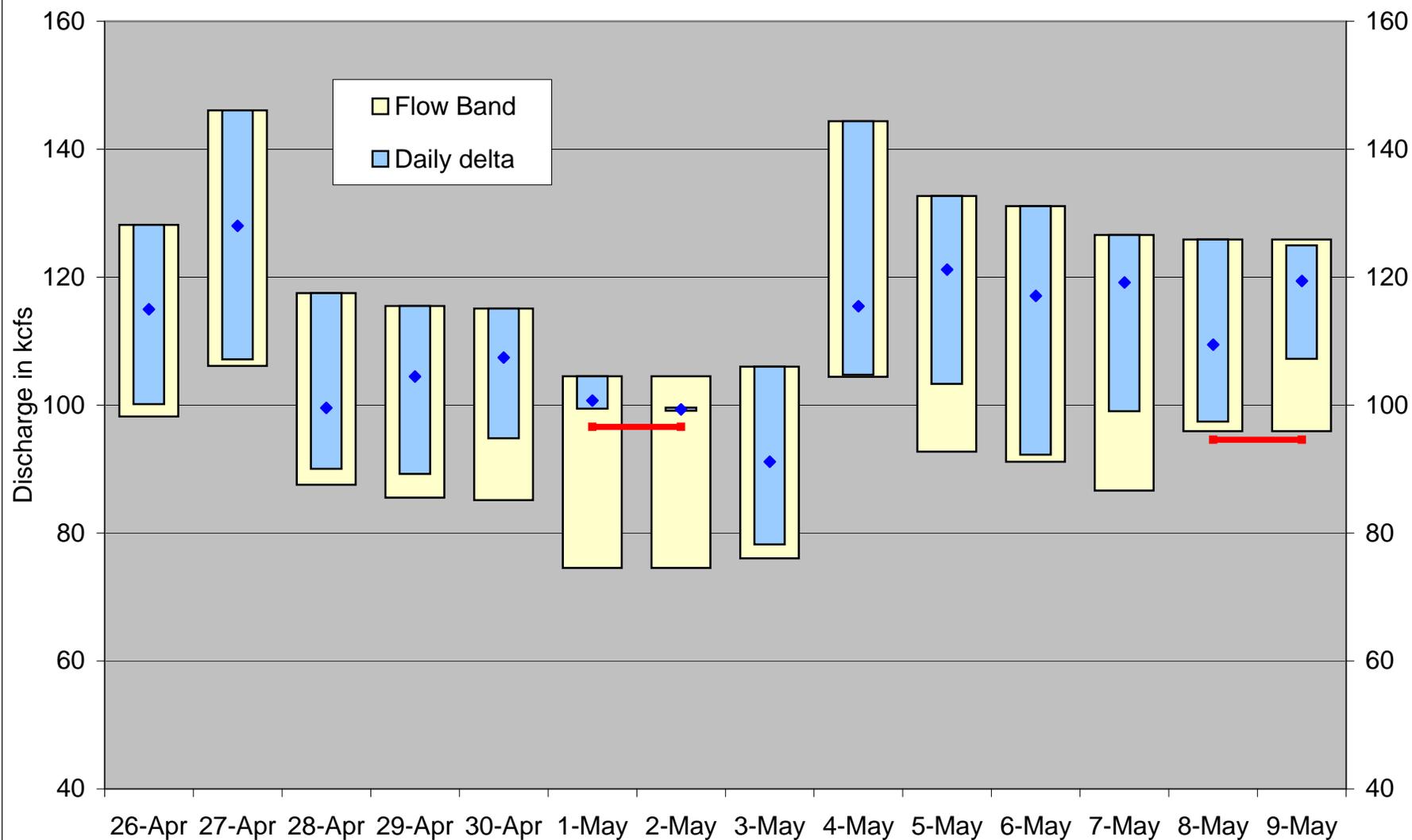
Libby Dam Deviation Request Accounting



- Inflow
- - - VarQ Outflow
- Dev Outflow
- - - VarQ Elevation
- Dev Elevation

Priest Rapids Operations 2010

Number of exceedances: 0



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

Conference Call

May 12, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 April 21, 28 & May 5, 2010

There were no changes to the 4/21 official meeting minutes or the facilitator's summary. Jason Flory, USFWS, had an edit to the 4/28 facilitator's notes: on page 3, it should read “7-21 days.” Dave Wills, USFWS, mentioned changes to the 4/28 official meeting minutes: on page 9 it should read “until the 260 KAF is stored.” Wills also mentioned an edit to the 5/5 official minutes: on page 5 it should read “the COE expects a total of 260 KAF.”

Action/Next Steps: DS Consulting and The COE will make the necessary changes and re-post these sets of notes to the web. All three sets will then be considered final.

Libby Spring Operations

Steve Barton, COE, asked Joel Fenolio, COE, to walk TMT through two graphs (posted in one link to the agenda) detailing modeling data that track the storage accounting based on actual volume and flows over the past week. Fenolio noted that 140 KAF had been stored thus far and inflows are 6-7 kcfs. He explained that storage is a little over half way to the 260 KAF, which is expected to be around May 19th (he noted this date is flexible and can shift). At that time, flows will ramp up to 14.5 kcfs (VarQ flow). He said the latest data indicates that that the 260 KAF will be out by June 30th and elevation will be at 2417' at that time. Fenolio said that that the models assumed a June 1 start date for the sturgeon pulse; if the pulse begins later than June 1, which is likely, flows would be increased to 18-20 kcfs (which is above VarQ flows) to move the 260 KAF out by the end of the month. If the pulse starts earlier than June 1, which is unlikely, the COE would have more flexibility to shape flows. Jim Litchfield, MT, noted the concern for a drastic drop in pool elevation; Fenolio said the sturgeon recovery team is working on an SOR surrounding the Sturgeon Pulse that will help ensure a gradual release of the storage. Paul Wagner, NOAA, asked what triggers determine the start of fish operations; Fenolio answered that temperatures, fish movement and flow are all factors.

Action/Next Steps: Fenolio will update the storage links each week by Tuesday am, so the Salmon Managers can review the latest data at their FPAC meetings. This agenda item will be revisited weekly.

Priest Rapids Flow Objectives

Paul Wagner, NOAA, recalled for TMT that the current flow objective is 135 kcfs, per last week's TMT meeting. He said that in looking at Grand Coulee flows this week, the move to 135 kcfs at Priest Rapids may have been a bit ahead of natural flows. Wagner said that fish data indicates that fish are already gone or have yet to arrive; assuming migration is still coming, it wouldn't be prudent to have the Columbia River flows ahead of the Snake River flows. As such, the Salmon Managers discussed stepping flows down to 130 kcfs. Tony Norris, BPA, noted that if backing off is a consideration, Grand Coulee discharge can be incrementally reduced as early as this week and into next. John Roache, BOR, clarified that a decrease of 5 kcfs at Priest Rapids saves about 1 foot per week in the Grand Coulee pool. Wagner suggested that it's a matter of managing the resource available with a certain degree of uncertainty; he said that the Salmon Managers suggested a conservative route, given the conditions that currently exist. BPA and the COE stated that Grand Coulee could be managed in a manner that achieves the flow objectives at Priest Rapids. Jerry Marco, Colville Tribe, said that while the Tribe supported a decrease, they prefer flows not drop below 125 kcfs as there may be some Summer Steelhead present who need support.

Action/Next Steps: The Action Agencies will operate Grand Coulee to support a flow objective in the range of 125-135 with 130 being the target. Wagner will update TMT on these operations at the TMT meeting on 5/19.

Hanford Reach Update

Russell Langshaw, Grant County PUD, directed TMT to chart, posted as a link to the agenda; he noted that flows have been consistent since his last update. The daily delta was 30-40 kcfs, mean daily discharge was minimum 91.2 kcfs and maximum 128 kcfs, with an average of 110.5 kcfs. Flows from Priest Rapids were minimum 78.2 kcfs and maximum 107.2 kcfs, with a mean of 97.3 kcfs. Maximum discharge was 99.6-146.1 kcfs, with a mean of 122.7 kcfs. The daily delta was .5 kcfs-39.7 kcfs, with a mean of 25.5 kcfs. Langshaw said temperature units were 1100 from the end of spawning, so there will likely be 3 more weeks of protection. Weekend protection levels were at 96.6 and 94.6 for the first and second weekends. He added that the end of emergence has been reached, so the only constraints going forward are for the daily deltas.

Action/Next Steps: Langshaw will provide another update to TMT for the 5/26 meeting.

Water Management Plan Spring/ Summer Update

Steve Barton, COE, reported back to TMT that the COE had received excellent comments; they have been incorporated into a revised version. There will be a final Action Agency review this week and the final version will be submitted to the court and posted to the TMT site by C.O.B. Friday (though Barton noted per the BiOp that the true deadline is midnight this Saturday.) Barton thanked all those who submitted comments.

Treaty Fishing

Tom Lorz, CRITFC, shared with TMT that more tribal fishing has commenced per an SOR #2010-C2, posted as a link to the agenda. A 1.5' band was requested at Bonneville, John Day and The Dalles and Lorz clarified that Treaty Fishing will go from Tuesday through Friday of this week. Steve Barton, COE, asked Lorz if more SORs are

anticipated; Lorz said that the need will be evaluated week per week depending on catch counts.

Action/Next Steps: The COE will implement the SOR as written; Lorz will check in with TMT next week and will report catch counts to TMT as they are available.

Dworshak Operations

Paul Wagner, NOAA, walked TMT through SOR #2010-02, posted as a link to the agenda. The request was for increasing flows at Dworshak to full powerhouse (10kcfs) for three consecutive days during the week of May 17th. Wagner noted that since the SOR was crafted, the forecast for the Snake River run-off peak has changed; he said that for today's call, the Salmon Mangers hoped to discuss how to best meet the intent of the operational request, while recognizing the changing forecast and risks to meeting refill later in the season. He noted that the intent of the request is to provide a migration "queue" by aiding flows. Dave Statler, Nez Perce Tribe said that he understood the need to encourage downstream movement and that to the extent that flows could be augmented by Dworshak, the request is reasonable, provided the risk to refill is contained.

TMT discussed the uncertainties and risks of the proposed operation and reviewed data posted as a link to the agenda; Steve Hall, COE, referred to refill probability data based on 15 similar water years; he said that the data projected that the "cost" of running outflows at full power house (about 10kcfs) for three days is that the pool would end up 3 feet lower than without implementing the SOR. Hall said that while the forecast is uncertain, if it were to stay exactly as it is predicted today, then there would be just enough water to meet the request in the SOR and the project would still meet refill. Hall emphasized that the forecast changes rapidly, due to temperature and precipitation. He clarified that in the year 1987 (when refill was missed by 18'), the peak runoff was observed on May 1; so far this year seems to be tracing closely to 1942 and 2001.

Statler said that while the Nez Perce Tribe does want to support outmigration, he wondered if two days of elevated flows would help manage the risk of less augmentation available later in the summer. Wagner clarified that if natural flows are in the range of 100 kcfs, the SOR would be unnecessary; he added the latest forecast forecasted flows in the 75 kcfs range for next week and noted that warming in the forecast will help the increasing migration; however, if conditions change and there was a "forecast bust" over the next few days, then TMT would need to discuss updated data before making a decision. The COE cautioned that the pool elevation at Brownlee has been decreasing, which indicated that Idaho Power might be trying to capture some of the run-off volume. Barton cautioned that regulation from Idaho Power could counter the objectives in the SOR. BPA noted that a couple of days lead time would be necessary to coordinate the change specified in the request. Russ Kiefer, ID, noted that temperatures at Lower Granite have been lower than average; however, he acknowledged that the risk to having less flow augmentation during the hot summer timeframe is not taken lightly.

Action/Next Steps: This issue will be discussed at a TMT conference call on Monday 5/17 at 1:00pm. Paul Wagner will coordinate with Idaho Power and the COE will provide any relevant hydrological data to TMT (possibly via an email on Friday.) Call-in information will be posted to TMT site.

Ice Harbor Spill Levels

Russ Kiefer, ID, presented TMT with SOR 2010-03 and apologized for the short notice to TMT members, noting that identifying the needs of fish is often sudden and unplanned. Steve Barton, COE, reminded members that SOR's are expected to be emailed to all TMT members and to all persons named in the "to" section of the SOR. Kiefer said that this SOR is in response to a recent review of a draft research report regarding passage at Ice Harbor Dam and a review of this years PIT tag detection data that supports the researchers' conclusions. Kiefer said he drafted this SOR out of concern that during the 30% spill block periods of the current spill operations more fish are routed through the JBS, and passing those fish through the surface weir would be better for the fish. He shared that a 50% flat spill pattern during this latter part of spring migration should increase adult return rates and could be better for our power system by making power production more stable. Tony Norris, BPA, clarified that power production would not necessarily be more beneficial because of a flat spill pattern. Kiefer clarified that this SOR would apply only to spring operations and was intended only for this year's operation. He acknowledged there is an Ice Harbor Configuration Operations Planning group that is discussing long term spill rates. Kiefer noted that timing for this request was an issue, as the operational change would be more effective if it were implemented sooner rather than later; an initial TMT poll on their response to the SOR was conducted as follows:

- COE: cannot support or not support the SOR at this time; need more time to review internally.
- OR: also needs more time to consider the SOR, but does see some merit for discussion and hopes the Salmon Managers can discuss the request further.
- MT: not sure how the SOR fits into the litigation frame work and suggest the request needs legal analysis as to what it would mean for other operations that are "rolled over" from previous BiOps.
- CRITFC/Umatilla Tribe: encouraged the Action Agencies to consider the request and implement a spill level that is best for fish survival; the SOR is on the right track but may need some revision.
- WA: agree that the COR is on the right track and would like to caucus with Salmon Managers. Also agree that the request needs to be addressed quickly.
- BOR: needs more discussion internally and with the COE.
- BPA: needs more discussion internally and with the COE.
- USFWS: appreciate the effort behind the SOR and would like more time to discuss the request internally and with fellow Salmon Managers.
- NOAA: glad ID took first step; think that the proposal is reasonable, but would like more time to discuss the request internally and with the Salmon Managers.

Action/Next Steps: Kiefer will share his reference material via email for TMT reference. TMT members to discuss with their agencies, and each other as needed, before reconvening on this subject during the Monday conference call at 1:00pm.

Spillway Weir Operations at Little Goose

Tim Dykstra, COE, outlined for TMT, per the Fish Passage Plan, the current operation of the spillway weir; he said it was in the high crest position (passing 7 kcfs flows). He reported that a change form had been drafted, to shift to the low crest position (passing 10

kcfs), as the latest STP forecast showed 10-11 days of projected flows over 70kcfs. Dykstra acknowledged that an FPOM meeting was planned for 5/13, but that he wanted to coordinate this effort with the Salmon Managers as soon as possible before peak migration begins, which is expected next week. He clarified that the shift to the low crest position would require the weir to be out of service for about a day and clarified that during the outage, spill would continue with a uniform pattern. A TMT poll was taken on the request to change to the low crest position as soon as possible:

- CRITFC/Umatilla: OK
- ID: OK
- OR: OK
- USFWS: OK
- WA: Supports
- NOAA: Good operation
- BPA: OK
- MT: OK

Action/Next Steps: The operation will take place as early as tomorrow and should take one business day, weather permitting. The COE will send an update on the operation to TMT via email.

Other: The 5/26 TMT meeting will be held at the Spring Creek Hatchery – directions and location information will be shared via email by the facilitation team.

The next TMT meeting will be: conference call on 5/17 at 1:00 pm.

Agenda items will include:

- Dworshak Update
- Ice Harbor Update

Future TMT meeting schedule:

5/19 – conference call at 9:00 am.

Agenda items will include:

- Libby Operations Update
- Priest Rapids Update
- Treaty Fishing Update
- Dworshak Update
- Ice Harbor Update

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 12, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the COE, NOAA, Washington, Montana, USFWS, Idaho, CRITFC, Oregon, BOR, BPA, the Colville Tribe, Nez Perce Tribe 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 provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for April 21, 28, and May 5

There were no changes to the April 21 and 28 facilitator's notes today so both were finalized. Halton will redistribute the May 5 facilitator's notes to TMT with newly received comments incorporated.

Dave Wills (USFWS) commented on the April 28 and May 5 official minutes. The COE will make these changes and re-post the minutes:

- April 28 – Libby operations, middle of page 9: Replace “In response to the ICF date change, the COE modified Alternative 1 so that Libby would only release minimum flows until the 260 kaf is out of the reservoir,” with “...so that Libby would only release minimum flows until the 260 kaf is stored in the reservoir.”
- May 5 – Libby operations, page 5: Revise to say, “If the Phase 2 deviation is likewise approved...the COE expects a total of 260 kaf stored,” instead of “260 kaf stored.”

3. Hanford Reach Update

Since the last report to TMT, daily delta constraints in the Hanford reach have been in the 130-140 kcfs range, Russell Langshaw reported. Mean daily discharges from Priest Rapids Dam have been 91.2-128 kcfs, with an average discharge rate of 110.5 kcfs per day. Minimum flows have ranged from 78.2-107.2 kcfs per day with an average of 97.3 kcfs. Maximum discharge rates have been 99.6-146.1 kcfs with an average of 122.7 kcfs. Daily deltas ranged from 0.5 kcfs to 39.7kcfs with an average of 25.5 kcfs.

This past weekend was the last of four weekends of protection flows. Minimum and maximum flows for each weekend are depicted in the graph

attached to this agenda item. The minimum flows for the first two weekends were 96.6 kcfs and 94.6 kcfs, respectively.

The end of emergence has been declared, so protection of critical spawning elevations has ended, and daily deltas are the only remaining constraints in operating the dam. Langshaw will provide another update at the May 26 TMT meeting.

4. Libby Spring Operations

Joel Fenolio (COE) presented a link to this agenda item that depicts storage at Libby Dam accumulated under the Phase 2 operation. Through yesterday, the reservoir stored an extra 140 kaf, or a little over half of the 260 kaf goal. Inflows have been around 7 kcfs the past few days. May 19 is the projected date by which 260 kaf will be stored, and releases will revert from minimum flows to VARQ flows of 14.5 kcfs. Fenolio assured TMT that VARQ flows won't resume until the full 260 kaf has been stored in Libby reservoir.

Jim Litchfield (Montana) asked how the timing of the sturgeon pulse figures into assumptions behind the graph. Montana is concerned that if the sturgeon pulse is pushed later into June, the Libby reservoir elevation could fluctuate because there wouldn't be much time to evacuate the stored volume by the June 30 deadline for flow neutrality of Phase 2.

If the sturgeon pulse occurs later than assumed— it started on June 10 last year – the COE will probably evacuate some of the 260 kaf early, Fenolio said. Outflows at Libby would be matched to inflows as much as possible to smooth out the operation. The main triggers for initiating the sturgeon pulse are fish movement and water temperature. This year is similar to last year so it's highly likely the sturgeon pulse will occur later in June. If that is the case, the discharge would probably be 18-20 kcfs total flows, instead of the VARQ flows of 14.5 kcfs. Aware of concerns about elevation fluctuations, the COE is already working on ways to even out the flows in June.

5. Priest Rapids Flow Objectives

The current flow objective established last week is 135 kcfs at Priest Rapids Dam, but yesterday FPAC focused on concerns about the timing of Snake River migration and the need to match outflows with natural runoff, Wagner said. So the Salmon Managers are recommending a reduction in the flow target from 135 kcfs to 130 kcfs at this time. BPA has sufficient notice to adjust the flow objective for this week down to the 125-135 kcfs range, Tony Norris said.

Every 5 kcfs increase in the daily Priest Rapids flow objective costs about a foot per week in storage released from Grand Coulee, John Roache (BOR) said. A major concern the Salmon Managers have is scheduling releases to the arrival of Snake River runs, which appear to be late this year due to low flows in

the Snake. We need to avoid cutting mid Columbia flows for Grand Coulee refill at the very moment the Snake River juveniles hit the mid Columbia, Wagner emphasized.

In response to these concerns, the Action Agencies proposed a flow objective of 125-135 kcfs at Priest Rapids, with 130 kcfs as the planning target. **NOAA, Montana, USFWS, BOR** and the **Colville Tribe** endorsed the 130 kcfs target. However, the Colville Tribe would object if flows at Priest Rapids drop below 125 kcfs because upper Columbia summer steelhead are currently passing through the mid Columbia and need the water.

6. Water Management Plan – Spring/Summer Update

The COE has incorporated all comments received and is internally reviewing the final version of the WMP spring/summer update. The final document will probably be posted by 5 pm on May 14, at the very latest by the BiOp deadline of midnight May 15, Barton reported.

7. Treaty Fishery – SOR 2010-C2

Treaty fishing under this system operational request began at 6 am on May 11 and will continue through 6 pm on May 14, Tom Lorz (CRITFC) reported. The SOR calls for a 1.5-foot operating band at Bonneville, John Day and The Dalles pools for the duration of the treaty fishery. The SOR states that CRITFC anticipates additional fisheries in May.

The COE will implement this SOR as written. TMT will revisit treaty fishing plans during its May 19 conference call.

8. Dworshak Operations – SOR 2010-02

Paul Wagner (NOAA) introduced this SOR on behalf of the Salmon Managers. It requests that outflows from Dworshak Dam be used for 3 consecutive days to increase discharges to powerhouse capacity. The purpose of the 10 kcfs/day, or 30 kcfsd total outflow, is to augment the peak of an increasing inflow hydrograph. When the SOR was drafted, flows at Lower Granite were expected to peak on May 20. The current forecast, however, has increased substantially.

While the Salmon Managers recognize that SOR 2010-02 puts Dworshak refill at some risk, it appears that a large number of fish have not yet passed Lower Granite Dam, and past years' data suggest that a number of fish remain in the Snake basin, waiting for flows to increase. The Salmon Managers are willing to risk having Dworshak miss its refill target by a few feet in order to give these reluctant spring migrants a signal that it's time to move. The longer they delay, the greater the likelihood they won't return as adults. And recent COE modeling shows the hydro system has an increase of at least 30 kcfsd in operational flexibility to provide this pulse for juveniles.

Dave Statler said the Nez Perce Tribe supports the SOR as long as the risk to Dworshak refill is contained. To address uncertainties in calculating the probability of refill, Barton gave a PowerPoint presentation (linked to today's agenda) that evaluates the risk to date. With the current operation at minimum discharge of approximately 1.3 kcfs from Dworshak, the reservoir is projected to refill in 7 of the 15 most similar years to 2010. If the SOR is implemented, adding 3 days of full powerhouse operation (3 days at approximately 10 kcfs per day), Dworshak reservoir would refill in only 3 of the 15 most similar years.

The current April-July water supply forecast for Dworshak is 1,526 kaf; the current May-July forecast is 1,143 kaf. Steve Hall (COE) said the estimated 56 kaf needed to fulfill this SOR would result in a Dworshak pool elevation that's about 3 feet lower in the historic years that didn't refill. The current operation of 1.3 kcfs minimum outflows offers a 56% chance of Dworshak refilling under the latest water supply forecast, which means refill would happen if all aspects of the forecast are accurate. That forecast shows a 50 kaf cushion that should cover the additional 10 kcfs of full powerhouse flow for 3 days. However, implementing the SOR would absorb all of the COE's operational flexibility to respond to changes in conditions, Hall explained.

Statler suggested the Salmon Managers consider a compromise operation such as 7.5 kcfs for 3 days or 10 kcfs for 2 days. Barton asked whether there's a flow level at which the Salmon Managers would deem this SOR unnecessary. If natural flows at Lower Granite are 100 kcfs or greater, no augmentation would be needed, Wagner replied. This is the only spring flow augmentation proposal the Salmon Managers expect to make this year unless inflows increase dramatically. If not, most species will need a boost, particularly steelhead and spring Chinook.

Barton emphasized that the peak flow at Lower Granite being targeted for augmentation involves assumptions about the operation of Brownlee reservoir that add to the risk. Wagner and Barton agreed that coordinating with Idaho Power regarding Brownlee and Grand Coulee operations would be in the region's best interest this year.

TMT set up a conference call at 1 pm, May 17, to discuss this SOR further. There was general agreement to hold off on implementation until then. A decision to augment peak flows at Lower Granite would be needed at least 3 days before the peak occurs, Barton said. A continued cool spring could result in less runoff volume than anticipated – snowpack has vanished under similar conditions, Litchfield pointed out and Hall agreed. However, there's still a fair amount of snow at higher elevations this year, and it's unlikely all of that will disappear.

If the COE has any relevant updates on May 14, TMT members will be notified. If not, TMT will revisit this SOR at 1 pm on May 17.

9. Ice Harbor Spill Levels – SOR 2010-C3

Russ Kiefer (Idaho) presented this SOR, which he arranged to have posted to the TMT web page late yesterday after reading a draft research study with possibly crucial implications for passage at Ice Harbor Dam this year. SOR 2010-C3 requests that Ice Harbor spill levels be changed to a flat rate of 50% spill in place of the current rollover operation – a spill test comparing 30% spill with 45 kcfs daytime and gas cap spill at night, per the 2004 BiOp.

Kiefer's request is based on PIT tag data that indicate adult return rates are higher for fish passing over surface routes such as the new Ice Harbor spillway weir vs. those that pass through the powerhouse. It appears that 30% spill would pass more fish through the powerhouse and juvenile bypass system than Idaho believes is prudent. While the SOR specified 50% spill, Kiefer would be open to a modified percentage if it's flat spill. He emphasized that this proposal is for spring migration only, and time is of the essence.

The SOR is related to the longer term process of developing a Configuration and Operations Plan for Ice Harbor Dam. However, the COP won't go into effect this year, with the BiOp rollover operation in effect. Kiefer's concern is that the peak of migrants will arrive at Ice Harbor during a block of 30% spill and end up going through the powerhouse. While the SOR is based on recent research findings, he noted that the researchers didn't participate in making this recommendation.

There was general agreement that more time is needed to review SOR 2010-C3 before deciding whether or not to implement it. TMT members shared their preliminary responses:

- **COE** – Still reviewing the SOR internally.
- **Oregon** – Believes the proposal has merit for discussion but would require legal analysis.
- **Montana** – Displacing the rollover operation with this SOR would require legal analysis. Also, more information is needed to substantiate that a spill rate of 50% is preferable to another rate.
- **CRITFC** – Any departures from BiOp spill levels would require consensus. The SOR is on the right track but warrants further discussion. A decision on whether to implement this SOR needs to be made quickly.
- **Washington** – The SOR is probably on the right track. Agrees that more discussion is needed among Salmon Managers and the rest of TMT.
- **USFWS** – More discussion is needed, especially among Salmon Managers.

Steve Barton	COE
Doug Baus	COE
Paul Wagner	NOAA
Charles Morrill	WDFW
Jim Litchfield	Montana
David Wills	USFWS
Russ Kiefer	Idaho
Tom Lorz	CRITFC
Ron Boyce	Oregon
John Roache	BOR
Tony Norris	BPA
Jerry Marko	Colville Tribe
Dave Statler	Nez Perce
Joel Fenolio	COE
Tim Heizenrader	Centaurus
Steve Hall	COE Walla Walla
Laura Hamilton	COE
Kim Johnson	COE
Steve Burrell	COE
Don Faulkner	COE
Dave Benner	FPC
Russ George	WMC
Ruth XX	JP Morgan
Glen Trager	Shell Energy
John Hart	EWEB
XX	Puget
Bill Crampton	CBB
Doug XX	Point Carbon
Rob Dies	Iberdrola Renewables
Tom Le	Puget Sound Energy
Russell Langshaw	Grant PUD
Margaret Filardo	FPC

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Monday May 17, 2010 1:00 - 3:00 pm

CONFERENCE PHONE LINE

Conference call line:888-830-6260; ACCESS CODE = 797820;

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for Apr 28, May 5 and 12, 2010 [[Meeting Minutes](#)]
3. Dworshak Operations - Paul Wagner, NOAA Fisheries
 - a. [SOR 2010-02](#)
 - b. [Actual Versus Forecast at Lower Granite](#)
 - c. [Dworshak Operation with Pulse](#)
4. Ice Harbor Spill Levels - Russ Kiefer, IDFG
 - a. [SOR 2010-03](#)
5. Other
 - a. Set agenda and date for next meeting - **May 19, 2010**
 - b. [[Calendar 2010](#)]

Questions about the meeting may be referred to:

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

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

National Weather Service Northwest River Forecast Center

[Home](#)

[Site Map](#)

[News](#)

SNAKE--LOWER GRANITE DAM (LGDW1)

County: WHITMAN State: WA

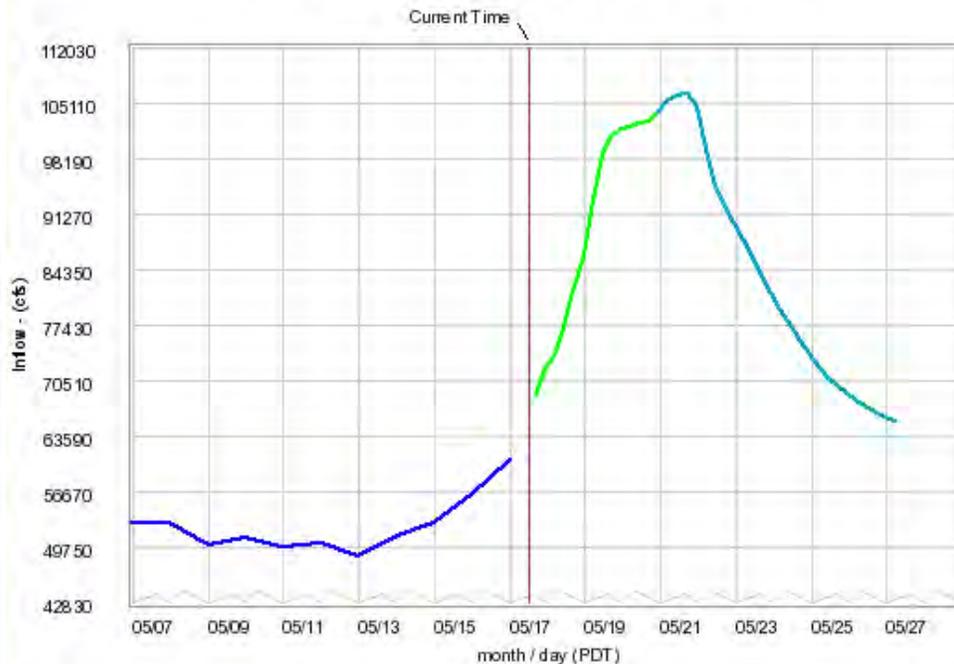
Elevation: 738 (feet) Latitude: 46 42' 0" Longitude: 117 25' 59"

River Information Plots

Monday - May 17, 12:53 PDT

The following data are preliminary and is subject to change

SNAKE -- LOWER GRANITE DAM (LGDW1)



Latest: 60600 cfs [05/17 00:00]

Daily statistics: none available

Observed — Forecast — Trend —

Fcst created: 2010May 17 12:20 PDT

Plot created: 2010May 17 12:28 PDT

Northwest River Forecast Center

For Data Used In Plot [XML](#)

SNAKE -- LOWER GRANITE DAM (LGDW1)

LWG Inflow, With Pulse



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

Conference Call

May 17, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 – SOR 2010-02

Paul Wagner, on behalf of the Salmon Managers, reported as follow up to the 5/12 TMT discussion that the latest RFC data indicated inflows at Lower Granite would reach flows of 100 kcfs if SOR #2010-02 were to be implemented beginning May 19th. Wagner said that the Salmon Managers had discussed this item and recommended that the SOR be implemented beginning at 0001 hours on May 19th. Steve Hall, COE, referred TMT to links posted to the agenda; he noted that the actual conditions have not proven to be quite as wet as forecasted and said that flows may just barely meet 100 kcfs with implementation of the SOR. Hall added that flows are picking up, but not quite at the rate predicted in the latest RFC forecast. Steve Barton, COE, said that the predicted timing of the flow peak has been fairly stable and that for maximum benefit, the dates of May 19-21 would best suit the intent of the SOR. TMT members also discussed the aspect that Wagner sent Idaho Power an email informing them of this week's proposed operation.

Wagner clarified that if it became clear during the course of the operation that Lower Granite inflows would be over 100 kcfs, the Salmon Mangers would support backing off Dworshak outflows for the third day of the operation. TMT members also discussed the current temperature at Dworshak, which was in the range of 42-44°F. Dave Wills, USFWS, stated that anything between the current temperature and 47-48°F would be acceptable from the Dworshak Hatchery's perspective. Barton acknowledged that TMT has a conference call scheduled for 5/19 and suggested that updated flow information could be part of the discussion; he also suggested that for the sake of coordination with project operators/schedulers, the operational direction could be as follows:

- Operate Dworshak outflows at full powerhouse for three days beginning at 0001 hours on 5/19. If during the course of the operation it becomes reasonably prudent to assume that inflows at Lower Granite will exceed 100 kcfs, the Action Agencies will scale back Dworshak outflows such that Lower Granite inflows will not exceed 100 kcfs.
- Any changes in outflows will be made near midnight, and the COE will coordinate with ID regarding Dworshak temperatures.

A poll was conducted on the SOR as stated above:

- OR: ok
- ID: ok
- WA: ok, appreciate discussion of how to best meet intent of the SOR
- CRITFC/Umatilla Tribe: ok
- USFWS: ok
- NOAA: ok
- BOR: ok
- BPA: ok
- COE:ok

Action/Next Steps: The COE will implement the SOR as stated above. This item will be on the agenda for the 5/19 TMT call.

Ice Harbor Spill Levels – SOR 2010-03

Russ Keifer, ID, reported that since last week's meeting, he had heard from other TMT members that there would not be consensus on implementing SOR 2010-03. As such, Kiefer withdrew submittal of the SOR.

Libby Update: The COE stated that TMT members could expect an email if it was determined that the VarQ flow start date were to be set for anything other than the May 19th date discussed at last week's TMT meeting.

The next TMT meeting will be: 5/19 – conference call at 9:00 am.

Agenda items will include:

- Libby Operations Update
- Priest Rapids Update
- Dworshak Update
- Treaty Fishing Update

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 17, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the USFWS, COE, CRITFC, NOAA, BOR, Idaho, BPA, Washington, FPC 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 provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for April 28, May 5 and May 12

Review of meeting minutes and facilitator's notes was postponed until the next regularly scheduled TMT conference call May 19.

3. Dworshak Operations – SOR 2010-02

Paul Wagner (NOAA) reported on FPAC's consensus yesterday regarding Dworshak operations, absent representation from the Nez Perce Tribe. FPAC recommended that the Action Agencies proceed with this SOR to release full powerhouse (presumably 10 kcfs) of flow augmentation from Dworshak for 3 days beginning at midnight May 18 and continuing through May 21.

Steve Hall (COE Walla Walla) walked TMT through the COE's presentation on Dworshak operations, beginning with the third link to this item on today's agenda. Attachment C compares projected inflows at Lower Granite with and without a pulse from Dworshak. Without the pulse, it appears that inflows would peak at around 97 kcfs then recede. With the pulse from Dworshak, it appears that inflows would peak at just under 105 kcfs.

The modeling presented in Attachment B identifies a disparity of 5-10 kcfs between actual and forecasted conditions, with the forecast showing slightly wetter conditions or about 5 kcfs higher inflows than are occurring, Hall noted. This tendency toward overprediction means that inflows at Lower Granite are unlikely to go above 100 kcfs even with a pulse from Dworshak. While actual inflow volume could deviate from the forecasts, it's clear the peak at Lower Granite will occur May 19-20, making May 19-21 an ideal time for implementation of SOR 2010-02.

A potential source of unpredictability in the Dworshak operation is Idaho Power's operation of Hells Canyon Dam, Karl Kanbergs (COE) noted. The COE modeling presented today assumes Hells Canyon will pass inflows until May 18, then spill modestly (about a foot elevation) throughout the rest of the week.

Discussion turned to the Salmon Managers' caveat that flow augmentation be curtailed if inflows go above a daily average of 100 kcfs at Lower Granite. TMT considered what the triggers would be for ending full powerhouse releases from Dworshak. There was general agreement that Dworshak flow augmentation should only be cut if it's clear that inflows as a daily average will go above 100 kcfs at Lower Granite, not as an hourly reading. Idaho Power is already aware of the request for Hell's Canyon to pass inflows during the Dworshak operation, via an email from Wagner, so Barton suggested that TMT members hold off on further communication with them until after the Dworshak operation is complete.

Dam operators and power schedulers will need clear directions for implementing this SOR, Tony Norris (BPA) emphasized. TMT agreed that flow augmentation might be curtailed on May 21 if it's reasonable to conclude by the close of business on May 20 that Lower Granite inflows would be more than 100 kcfs as a daily average that day, based on midnight-to-midnight definition of a day. If that appears to be the case, the Action Agencies will scale back Dworshak flows on May 20 accordingly, with 100 kcfs as the targeted daily average. TMT will revisit this issue in its May 19 conference call and possibly schedule a follow-up call May 20 to make a final decision regarding Dworshak releases.

Due to ramping rates, the increase in flows is planned to occur within 2 hours beginning at midnight, Hall said. If a decision is made to cut Dworshak releases on May 21, that change will also occur at midnight in order to avoid impacting salmon fishing.

TMT turned to water temperature management at Dworshak reservoir. The current temperature of releases is 42-44 degrees F, Hall reported. Unit 1 is running in overshot mode, while units 2 and 3 are running in undershot mode. Hall asked whether these units should be switched into overshot mode. After discussion, TMT decided not to advise changing units 2 and 3 into overshot mode yet. Dave Wills (USFWS) advised not letting releases get any colder than they are now. He has not received any recent requests from the Dworshak hatchery for temperature management. The current temperature at Orofino gage is around 50 degrees F, Russ Kiefer reported. Kiefer advised saving cool water for later in the summer. In terms of motivating steelhead to migrate, cooler is generally better, Wagner said. NOAA would be comfortable with having the COE and Idaho coordinate temperature management and report back to TMT May 19.

TMT reached unanimous agreement on the Action Agency proposal to implement this SOR by beginning full powerhouse operations at Dworshak at 0001 hours on May 19 and continuing through May 21, with the caveat that flows from Dworshak would be scaled back as needed to target 100 kcfs inflows at Lower Granite. TMT members gave their views for the record:

- **Oregon** – No objection.
- **Idaho** – Favors the proposed operation.
- **Washington** – Supports the SOR and efforts to make it happen.

- **CRITFC** – No objection.
- **BOR** – No objection.
- **NOAA** – Supports the SOR.
- **BPA** – No objection.
- **COE** – Supports the SOR.
- **USFWS** – Supports the SOR.

4. Ice Harbor Spill Levels – SOR 2010-03

This SOR requesting flat spill at Ice Harbor in an effort to increase adult return rates was withdrawn by its sponsor. Idaho was thanked for submitting an innovative request that drew strong although not unanimous support.

5. Libby Operations

At the May 12 TMT conference call, May 19 was identified as the date by which 260 added kaf would likely be stored in Libby reservoir, and releases will revert from minimum flows to VARQ flows of 14.5 kcfs, Barton recalled. If that date is pushed further into May, the COE will inform TMT via email, unless the switch will occur after May 21. TMT will revisit Libby operations May 19.

5. Next Meeting

The next TMT meeting will be a conference call May 19 to discuss Dworshak and Libby operations, Priest Rapids flow objectives, treaty fishing, and review of meeting minutes. TMT will meet next in person May 26 at the Spring Creek Hatchery.

Name	Affiliation
Rick Kruger	Oregon
Doug Baus	COE
David Wills	USFWS
Steve Hall	COE Walla Walla
Steve Barton	COE
Tom Lorz	CRITFC
Paul Wagner	NOAA
Karl Kanbergs	COE
John Roache	BOR
Russ Kiefer	Idaho
Barry Espenson	CBB
Margaret Filardo	FPC
Tony Norris	BPA
Charles Morrill	WDFW

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Wednesday May 19, 2010 09:00 - 12:00

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

We have had disruptions on the phone because people are not hitting 'mute' after dial in.
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*All members are encouraged to call Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

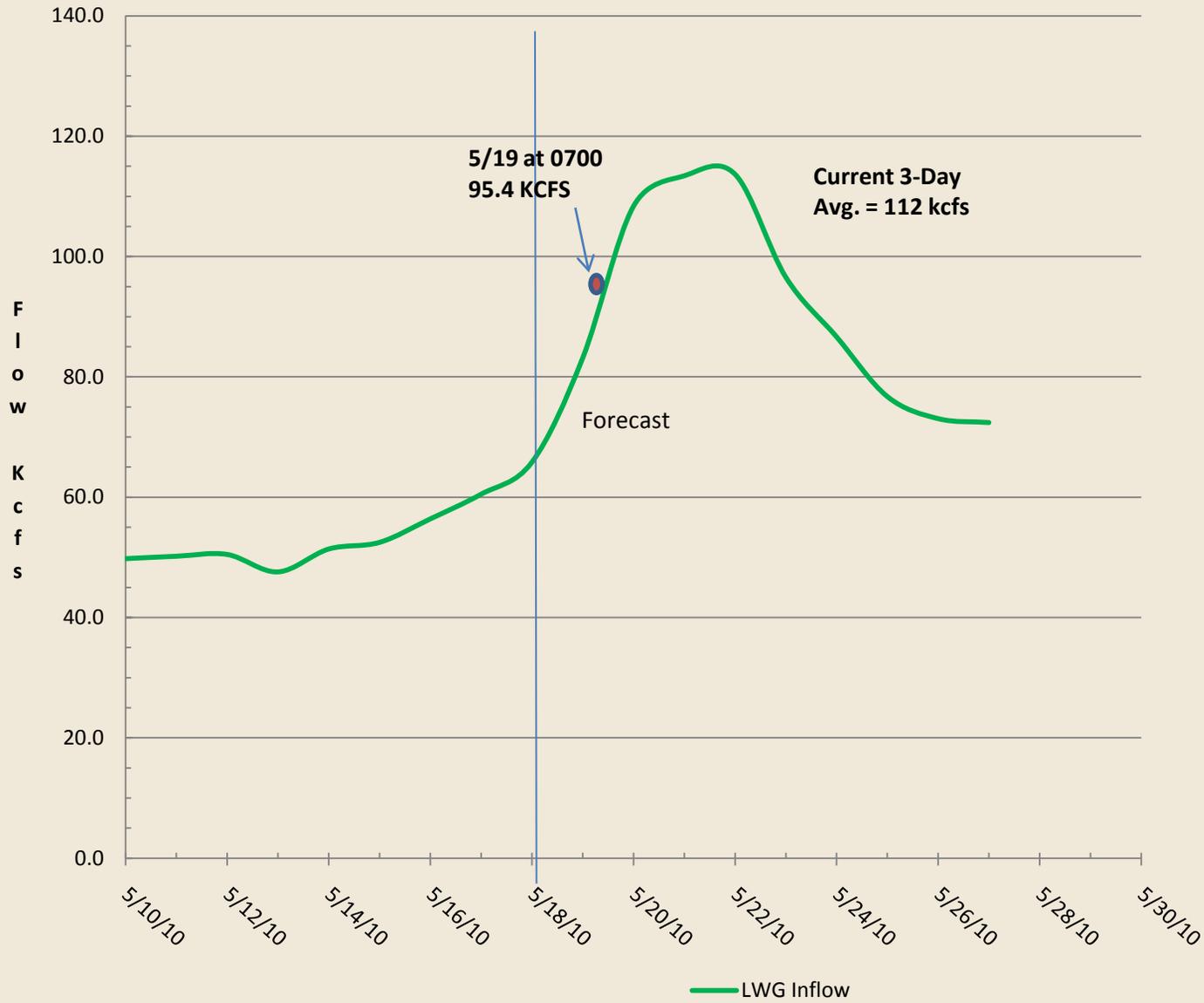
1. Welcome and Introductions
2. Dworshak Operations - Karl Kanbergs, COE-RCC
 - a. [Lower Granite Model Forecast](#)
 - b. [Actual Versus Forecast at Lower Granite](#)
3. Libby Spring Operations - Karl Kanbergs, COE-RCC
 - a. [Storage Accounting](#)
4. Priest Rapids Flow Objectives - Paul Wagner, NOAA Fisheries
5. Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows - David Wills, USFWS
 - a. [SOR: FWS# 2010-1](#)
6. Other
 - a. Set agenda and date for next meeting - **May 26, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

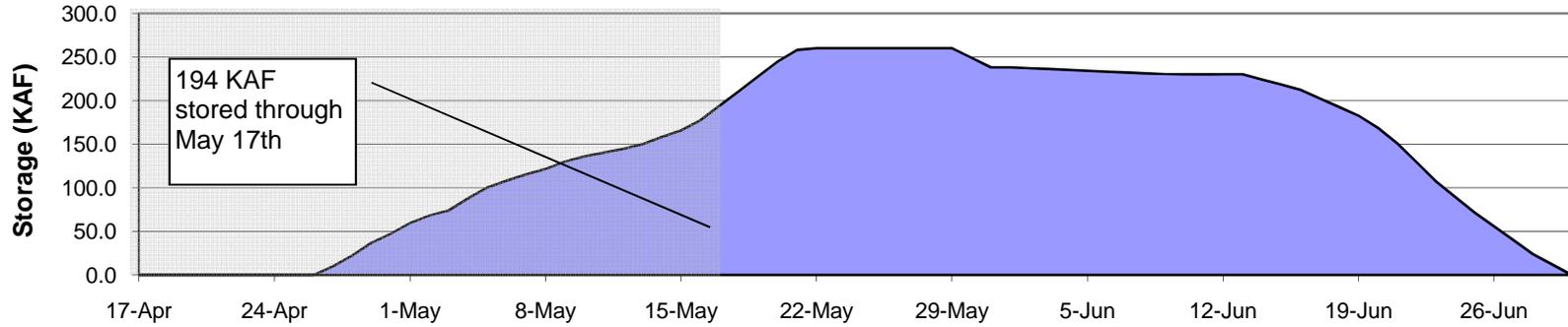
[Steve Barton](#) at (503) 808-3945, or

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

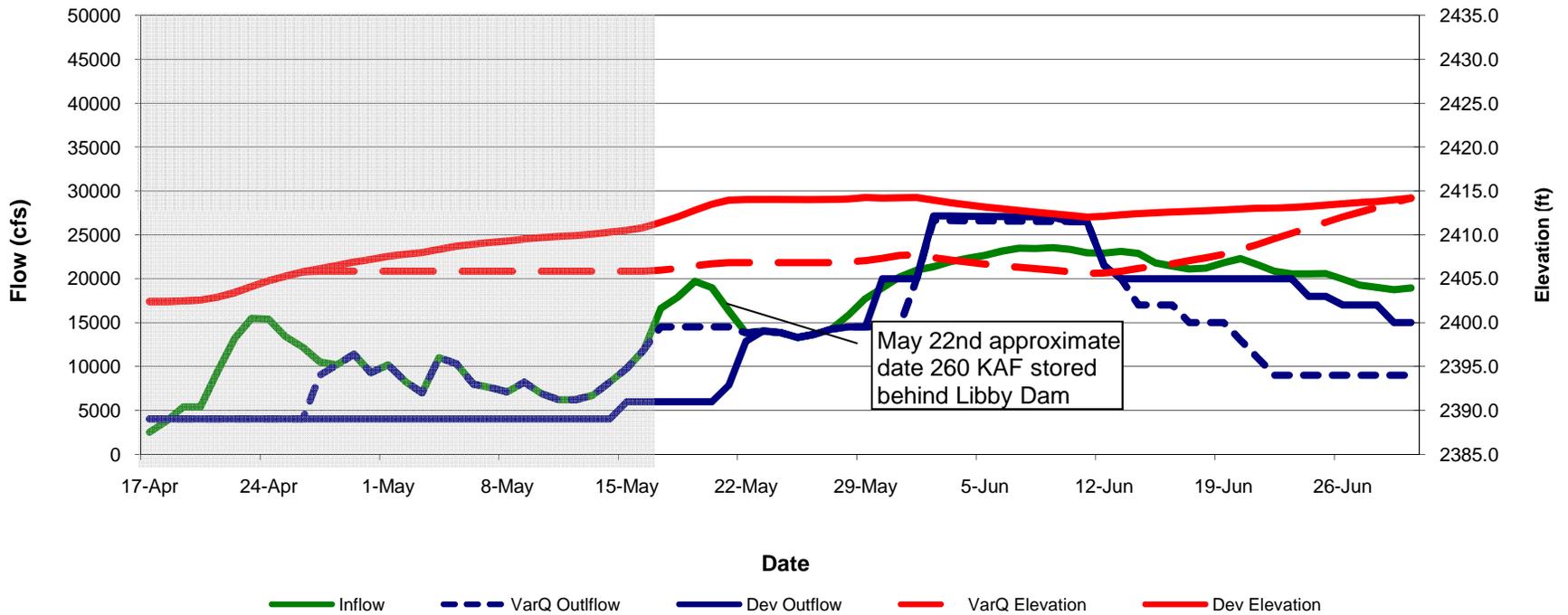
Lower Granite Flow, Model Results May 18



Libby Dam Deviation Request Accounting



Shaded Area shows operations to date



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

Conference Call

May 19, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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

Karl Kanbergs, COE, directed TMT to two graphs posted to the TMT agenda; it showed that if operations stay at full powerhouse for the three days (as requested in the SOR), flows into Lower Granite should average 112 kcfs over the 72 hour period. Kanbergs said that the inflows were slightly ahead of forecast as inflows at Lower Granite hit 95.4 kcfs this morning at 0700 hours and are expected to continue to pick up today. The COE has committed to keeping output at full load at least through tomorrow, 5/20, and it was noted that BPA has pre-sold power generated for 5/19 and 5/20. Kanbergs asked TMT members if flows at Lower Granite are expected to be over 100 kcfs on 5/21, should outflows at Dworshak be ramped down (around midnight) to around 5 kcfs. Kanbergs noted that the most recent STP suggested that Dworshak will just barely re-fill.

The group discussed the COE's modeling and the latest real-time data. The discussion of Dworshak operations over the past two TMT meetings was recalled by TMT members: the SOR called for full powerhouse operations out of Dworshak for three days (72 hours) during the week of May 17th. During the TMT call on 5/17, TMT members said they were amenable to reducing Dworshak outflows on the third day of the operation, as long as inflows at Lower Granite were expected to be no less than 100 kcfs, thus conserving Dworshak flows for summer flow augmentation and temperature control. Salmon Managers present on today's call said that they were okay with the Action Agencies operating Dworshak with the intent of maintaining a daily average of no less than 100 kcfs and acknowledged the need to assess one more day's data before any decision could be made with regard to reducing outflows on the third day of the operation. It was noted that juvenile steelhead numbers at Lower Granite are surprisingly low and the hope is that this operation will assist migration.

Action/Next Steps: The COE will work with BPA in adjusting Dworshak operations with the goal of achieving a daily average of at least 100 kcfs at Lower Granite for a three day period. Dworshak outflows will be run at full power house for no more than 3 days if needed to try to meet the flow objective, as was

requested in the SOR. TMT will review this item at the next TMT meeting on 5/26.

Libby Spring Operations:

Karl Kanbergs, COE, directed TMT to a link posted to the agenda. He reported that 194 KAF has been stored thus far in the Libby reservoir and that current flow estimates project 260 KAF to be stored by May 22nd. Outflows will be increased for VarQ operations on May 23rd.

Action/Next Steps: An update will be presented by the COE at the next TMT meeting on 5/26.

Priest Rapids Flow Objectives

Dave Wills, USFWS, reported that this issue was discussed at FPAC and their recommendation was to maintain the targeted 125-135 kcfs flows for another week. Tony Norris, BPA, brought up the question of whether it was time to transition to managing McNary flows and re-filling Grand Coulee, in order to avoid a precipitous drop in flows near the end of June. The group discussed the merits of maintaining Priest Rapids flow range of about 130 kcfs and re-filling Grand Coulee. John Roache, BOR, reminded TMT the refilling Grand Coulee is a requirement of the BiOp and the Water Management Plan. He shared STP data, released yesterday, which suggests that if Priest Rapids is kept at 125-135 kcfs, in order to fill Grand Coulee by July 1, flows will need to drop to 110 kcfs for the first week of June. An informal poll was taken of TMT members on this issue:

- NOAA: Need more discussion on the issue before making any operational decisions/changes.
- Colville Tribe: Changes to the BiOp or Water Management Plan takes a lot of analysis and assessment. Support staying with the 125-135 kcfs range for now and agree more discussion is needed.
- USFWS: Feels supporting the 125-135 kcfs range for one more week is appropriate.
- ID: Okay with 125-135 for one more week, and support further discussion amongst TMT members.
- OR: Okay with 125-135 for one more week, and support further discussion amongst TMT members. Do need to closely consider any major changes to the BiOp / Water Management Plan.
- BPA: appreciates the comments from TMT members about this water management decision and is open to further discussions surrounding Priest Rapids flows and Grand Coulee refill.

Action/Next Steps: TMT members support the targeted 125-135 kcfs flow range for one more week. TMT members will review updated water supply data before next weeks FPAC and TMT meetings. Smolt passage data can be found on the Fish Passage Center's web site. The mid- month forecasts, STP and probabilistic models will be available for next week's meeting. This issue will be on the agenda for the TMT meeting on 5/26.

Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows

Dave Wills, USFWS, presented SOR: FWS# 2010-1, posted as a link to the agenda. The SOR will provide extra flow for this year's Sturgeon Pulse operations. It outlines the targets and initiation points (i.e. temperatures, reservoir elevation, location of the Sturgeon population etc.) of the operation. He reminded TMT that the Sturgeon Pulse began last year on June 10th. Wills noted that this year's operation may start earlier, and he noted that the operation cannot start until turbine work at Libby is complete. He projects the initiation date to be between May 28th and June 10th.

Action/Next Steps: TMT members will review the SOR this week and it will be discussed in more detail at the next TMT meeting on 5/26. Members of the Sturgeon Recovery Team will call in to next weeks meeting to assist with questions.

The next TMT meeting will be: a Face-to-Face meeting at the Spring Creek Hatchery on 5/26 at 9:00 am.

Agenda items will include:

- Review of Meeting Minutes 5/12,17 &19
- Libby Spring Operations Update
- Priest Rapids Flow Objective Update
- Dworshak Operations Update
- Libby Dam Releases for Sturgeon and Bull Trout Augmentation Flows
- Treaty Fishing Spring Season Wrap-up Report
- Operations Review

Note: For those that are interested, there will be a tour of the Spring Creek Hatchery prior to the TMT meeting at 8:00am. Details and directions will be provided by Dave Wills for distribution by Erin Halton.

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 19, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Karl Kanbergs (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the USFWS, COE, BPA, BOR, Nez Perce and Colville tribes, Idaho, NOAA, Oregon 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 provide them to the TMT chair or bring them to the next meeting.

2. Dworshak Operations

Yesterday the COE ran a model showing that full powerhouse flows of approximately 10.1 kcfs out of Dworshak Dam for 3 days would yield a daily average of 112 kcfs inflows for those 3 days at Lower Granite Dam, Karl Kanbergs (COE) reported. These findings are presented in attachment 2a. As of this morning, Lower Granite inflows were 95.4 kcfs and rising, with an expected daily average of more than 100 kcfs today and 110 kcfs tomorrow, May 20.

In a May 17 conference call, TMT considered SOR 2010-2 regarding Dworshak operations. The resulting recommendation for a full powerhouse operation May 19-21 also asked the Action Agencies to scale back Dworshak outflows on May 21 if it was deemed reasonably prudent to assume that inflows at Lower Granite would be more than 100 kcfs. The purpose of this caveat from the Salmon Managers was to save water for use as summer flow augmentation.

Attachment 2b shows that inflows to Lower Granite will most likely be more than 100 kcfs as a daily average for May 19-21, exceeding the inflow expectations of SOR 2010-2, Kanbergs said. Both graphs include the effect of full powerhouse flows from Dworshak on those days. Steve Hall (COE) noted that inflows vary on an hourly basis, and the 10.1 kcfs in flows coming from Dworshak include water for the Dworshak hatchery, which isn't part of powerhouse releases.

In an effort to preserve water for Dworshak refill, the COE proposed to possibly reduce the operation to one small unit, or approximately 3.4 kcfs, while targeting 100 kcfs daily average inflows to Lower Granite through May 21. The Action Agencies have a power sales commitment to keep Dworshak at full load through midnight May 20, at which time the Corps could reduce outflows.

Stakeholders expressed their views of the Dworshak operation:

- **Oregon** – Given that the proposal to curtail Dworshak output at midnight on May 20 would save only around 10 kaf, Oregon favors continuing full powerhouse discharges through May 21 as the SOR originally requested.
- **NOAA** – Will be satisfied with the Dworshak operation as long as it produces a daily average of at least 100 kcfs inflows at Lower Granite for 72 hours. Wants a daily average of 100 kcfs or more, not a 3-day average of 100 kcfs per day.
- **USFWS** – Agrees with NOAA that 100 kcfs inflows at Lower Granite for 3 days is the clear goal of the Dworshak operation. The SOR calls for a maximum of 3 days of full powerhouse operation at Dworshak, not a guarantee that it will produce 100 kcfs inflows at Lower Granite.
- **Nez Perce Tribe** – The SOR’s goal of 100 kcfs inflows at Lower Granite for 72 hours doesn’t have to mean 72 hours of 10 kcfs outflows from Dworshak. Advised proceeding carefully to maximize water reserves for summer; wants to capture any opportunity to conserve at Dworshak now.
- **Idaho** – The main objective is to maintain 100 kcfs inflows at Lower Granite for 72 hours.
- **BOR** – A daily average of 100 kcfs inflows at Lower Granite for 72 hours is acceptable.
- **BPA** – Wants a clearly defined plan for ramping the Dworshak operation up and down. A daily average of 100 kcfs inflows at Lower Granite for 72 hours is acceptable.
- **Colville Tribe** – Abstained from voting on this issue.

Instead of checking in tomorrow on Dworshak operations as initially envisioned, TMT members decided that having consensus on a goal of 100 kcfs daily inflows at Lower Granite for 72 hours means further coordination can occur via email. TMT will revisit this issue at its next meeting. *(In a May 20 email, the COE notified TMT that daily average inflows at Lower Granite on May 20 will be around 104.6 kcfs, and near 100 kcfs on May 21 but not much higher. Therefore, the COE will continue to operate Dworshak at full powerhouse through May 21.)*

3. Libby Spring Operations

Karl Kanbergs (COE) reported to TMT on Libby Dam operation. Attachment 3a shows that as of May 17, an additional 194 kaf had been stored in Libby reservoir as a result of deviating from the VARQ operation as supported by TMT. The latest inflow estimate suggests that the goal of storing 260 kaf of flow augmentation for the sturgeon pulse will be attained by May 22-23. At that time,

presumably on May 23, Libby will ramp up to VARQ flows. TMT will revisit Libby operations at its May 26 meeting.

4. Priest Rapids Flow Objective

Yesterday FPAC discussed flow objectives for Priest Rapids Dam and agreed to recommend maintaining the 125-135 kcfs daily flow objective for the coming week, David Wills (USFWS) reported.

Tony Norris (BPA) asked whether it's time to manage to McNary flow objectives instead of Priest Rapids. It would be prudent to begin working toward Grand Coulee refill in order to avoid a precipitous drop in flows at the end of June. McNary outflows are finally at 200 kcfs and will probably remain so for the next week or more. FPAC members could discuss that proposal but haven't done so yet, Wills replied. NOAA would want to see inflow forecasts at Grand Coulee before switching to McNary flow objectives, Rich Dominique (NOAA) said.

According to yesterday's STP projection, maintaining a flow target of 125-135 kcfs at Priest Rapids would put Grand Coulee reservoir at elevation 1,260 feet by the end of May, John Roache (BOR) reported. In order to fill Grand Coulee by the 4th of July, Priest Rapids flows would have to drop to the 110 kcfs range by the first week of June and gradually decline from there. Drafting Grand Coulee in order to continue providing a 130 kcfs flow average at Priest Rapids through next week could mean a bigger decline in Priest Rapids flows later, Kanbergs said.

Dominique suggested that in such a low flow year, TMT should consider giving higher priority to meeting spring flow objectives then achieving the refill elevation target at Grand Coulee. Other TMT members noted that wouldn't meet objectives identified in the BiOp and Fish Operations Plan, and such a departure would require TMT consensus. More information is needed on this alternative.

TMT members gave their views of the Priest Rapids flow objective:

- **Colville Tribe** – Supports continuing Priest Rapids flows at an average of 130 kcfs for another week. At this time, favors keeping Grand Coulee refill as a high priority, but would consider changing that later if necessary. Wants information on water forecasting and migration status to be presented at the May 26 TMT meeting. Suggested the Salmon Managers reconsider transportation if they foresee drafting Grand Coulee beyond its capacity for refill. The tribe would object to a water request to save Snake River fish that could have been transported.
- **NOAA** – Supports maintaining the 125-135 kcfs flow objective at Priest Rapids for the coming week. Believes it makes sense to consider not meeting the Grand Coulee refill objective in such a low water year. Modeling and thorough discussion of this alternative is warranted.

- **USFWS** – Agrees with NOAA that continuing the 125-135 kcfs objective at Priest Rapids is appropriate at this time.
- **Idaho** – Continue providing 125-135 kcfs at Priest Rapids until there's new information or further discussion.
- **Oregon** – Now's not the time to cut flows in the mid Columbia. Continue providing 125-135 kcfs at Priest to prod juveniles out of the system. TMT should reassess next week how to manage flows in June.
- **BPA** – A departure from the Grand Coulee refill objective could be considered but would require consensus. Continuing to provide Priest Rapids flows at the current level will result in lower flows this summer.
- **BOR** – It's possible now to keep meeting the Priest Rapids objective, but that will involve a tradeoff and a later decision about which is worse – a sudden drop in Priest Rapids flows or missing Grand Coulee refill.

With consensus on maintaining the 125-135 kcfs flow objective at Priest Rapids for another week, TMT will revisit this operation at its May 26 meeting. The COE is working on a deterministic model involving several ESP traces, which will be ready for TMT review by the end of next week.

5. Libby Dam Releases for Sturgeon and Bull Trout Flows

Dave Wills presented SOR-FWS 2010-1, which summarizes the 2010 proposed Sturgeon operations and documents TMT's discussions of a deviation from VARQ flows this year to provide extra volume for the sturgeon pulse. The five-page SOR, attached to today's agenda, outlines the targets, temperature criteria at Bonner's Ferry and in Libby reservoir, elevation criteria, and spawning behaviors of tagged fish that will serve as triggers for the sturgeon operation.

Last year the pulse began on June 10. Information to date indicates that it is likely to begin earlier than June 10 this year. The soonest it could start would be May 28, when the final turbine at Libby will be restored to service. TMT members will review the SOR for discussion at next week's meeting. Any changes to the SOR would need to go to the sturgeon recovery team. Team leader Jason Flory (USFWS) will probably attend the May 26 TMT meeting.

6. Next Meeting

The next TMT meeting will be May 26 at the Spring Creek Hatchery. The meeting will begin at 9 am, preceded by a tour of the hatchery at 8 am. Topics to be discussed include Dworshak operations, Libby spring operations, Priest Rapids flow objectives, the sturgeon pulse, the status of migration, and review of meeting minutes.

Name	Affiliation
Dave Wills	USFWS
Doug Baus	COE
Karl Kanbergs	COE
Tony Norris	BPA
Jerry Giovando	COE Seattle
John Roache	BOR
Bill Rudolph	NW Fish Letter
Dave Statler	Nez Perce
Dave Benner	FPC
Steve Smith	Colville Tribe
Charlie Petrosky	Idaho
Barry Espenson	CBB
Laura Hamilton	COE
Steve Hall	COE Walla Walla
Rich Dominigue	NOAA
Scott Bettin	BPA
Ron Boyce	Oregon
Tom Le	Puget Sound Energy
Russ George	WMC
Greg Lawson	Point Carbon
Richelle Beck	DRA
Rob Dies	Iberdrola Renewables
Rob Allerman	Deutsch Bank

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday May 26, 2010 09:00 - 12:00

Spring Creek National Fish Hatchery
61552 State Road 14
Underwood, WA 98651
Map [\[Directions\]](#)

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for May 12, 17 and 19, 2010 [\[Meeting Minutes\]](#)
3. Libby Operations - Steve Barton, COE-RCC
 - a. [SOR: FWS# 2010-1 Libby Dam Releases](#)
 - b. [Storage Accounting](#)
4. Dworshak Operations - Steve Barton, COE-RCC
5. Priest Rapids Flow Objectives - Paul Wagner, NOAA Fisheries
6. Treaty Fishing Summary - Tom Lorz, CRITFC
7. Hanford Reach Summary - Russell Langshaw, Grant County PUD
 - a. [Summary](#)
8. Operations Review
 - a. Reservoirs
 - b. Fish
 - c. Power System
 - d. Water Quality
9. Other
 - a. Set agenda and date for next meeting - **June 2, 2010**
 - b. [\[Calendar 2010\]](#)

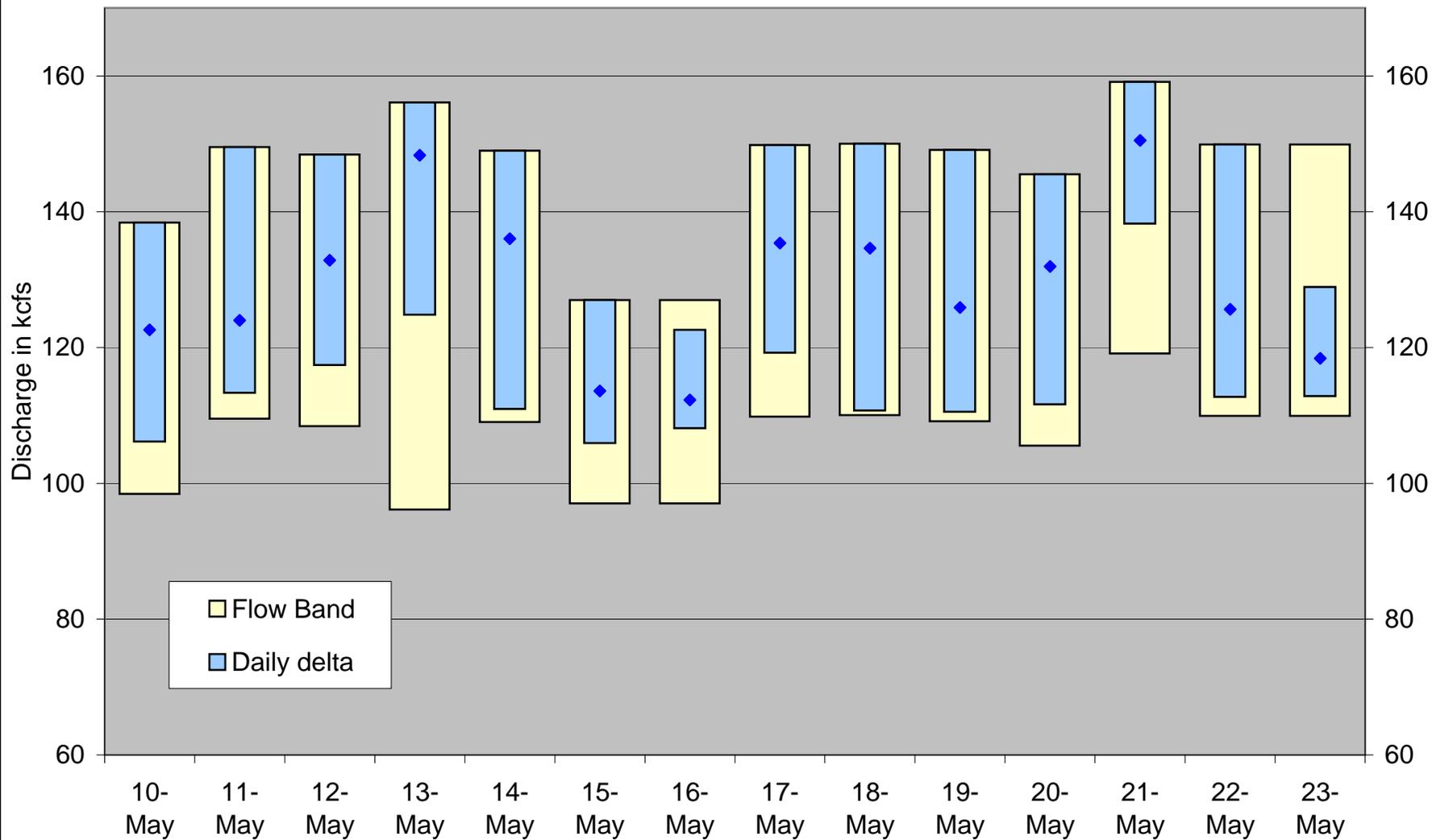
Questions about the meeting may be referred to:

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

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

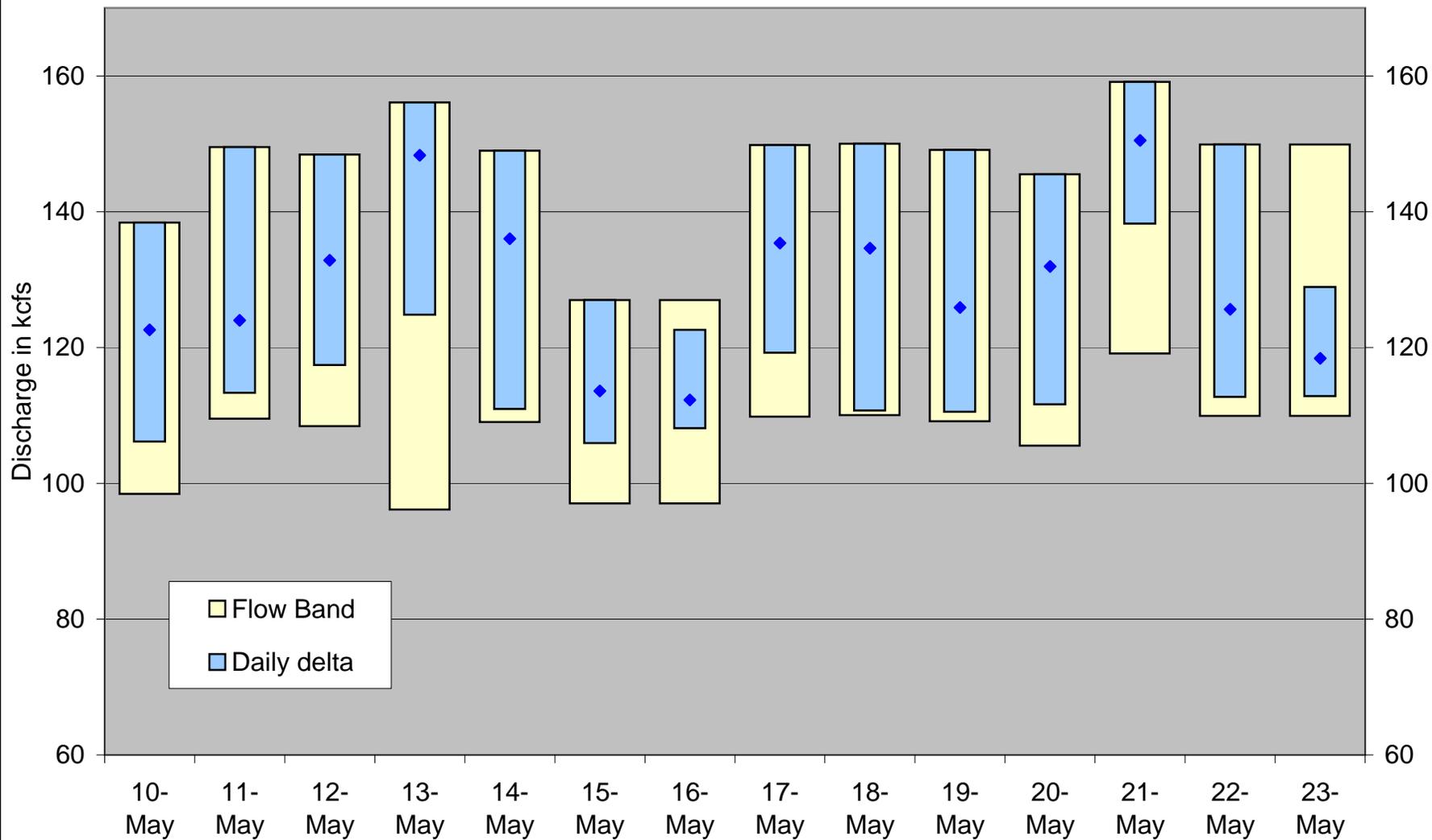
Priest Rapids Operations 2010

Number of exceedances: 0

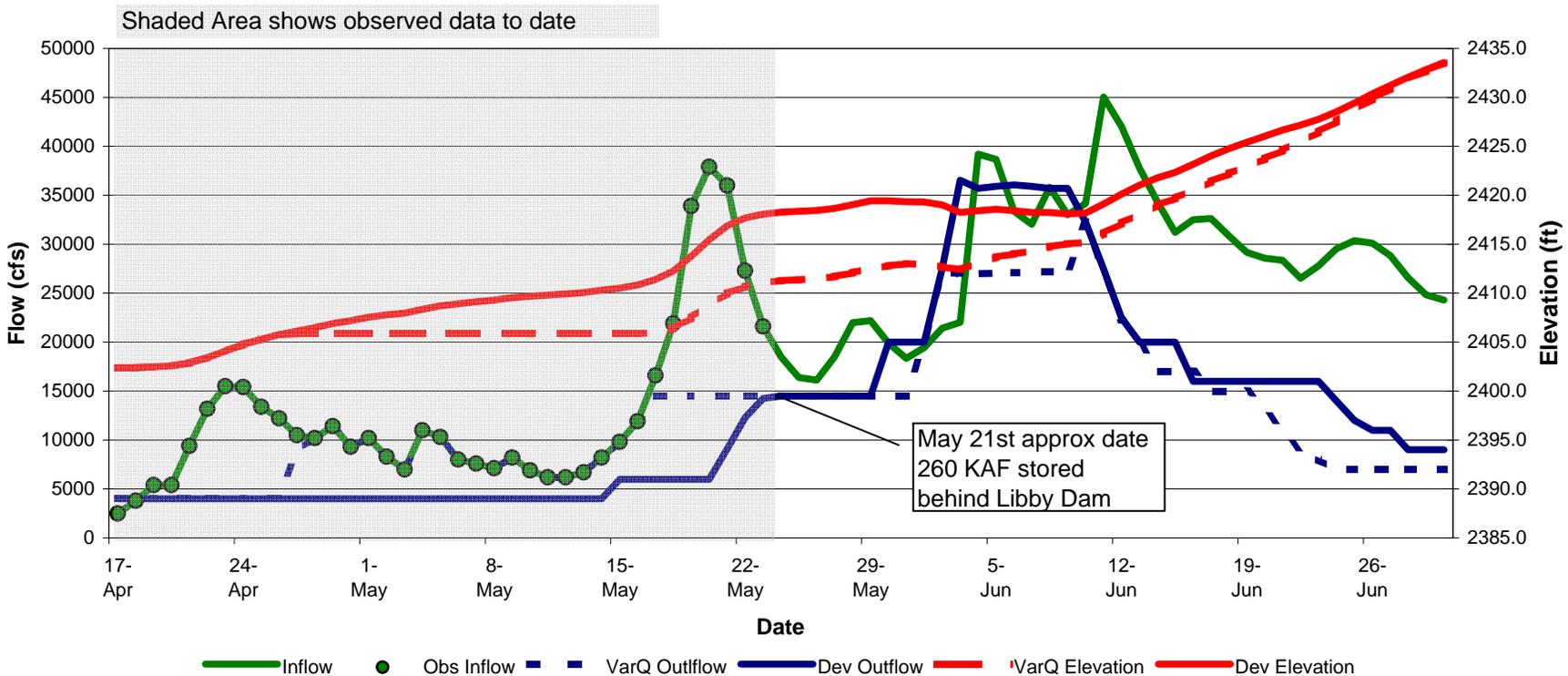
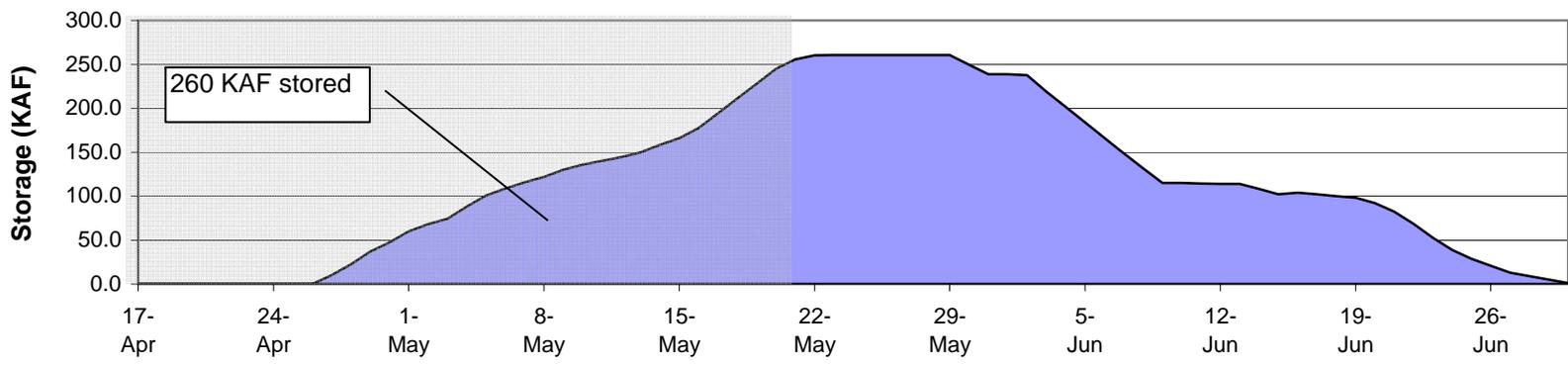


Priest Rapids Operations 2010

Number of exceedances: 0



Libby Dam Deviation Request Accounting



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

May 26, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

Notes: Christa Leonard

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 May 12, 17 & 19, 2010

Steve Hall, COE, provided edits to DS Consulting clarifying language in the Dworshak section on page 3 of the 5/12 facilitator’s summary. The group had no other changes to these or the May 17th or 19th notes. All three sets are now considered final as are the official meeting minutes from all three dates.

Libby Operations

Joel Fenolio and Jeremy Giovando, COE, directed TMT to link 3.b. posted as a link to the agenda. The graph details storage at Libby dam through yesterday 5/25. The 260 KAF target has been met and will be maintained until next week when release will begin and is assumed to reach zero by the end of June. Jim Litchfield, MT, stated that Montana’s concern is for Libby operations following the sturgeon pulse; specifically, to make sure there is enough volume to do a gradual ramp down. Litchfield said that what was shown in the graph posted to the agenda did not look too bad from Montana’s perspective.

Steve Barton, COE, presented TMT with new information that was brought up late in the day on 5/25 at a Columbia River Treaty meeting: BC Hydro has indicated an interest in keeping Kootenai Lake fuller into July and releasing water out of Arrow. Barton said that he wanted to share this with TMT, so he could be aware of their position on this option, if the opportunity becomes available. Tony Norris, BPA, stated the desire for clear communication around this option. Dave Wills, USFWS, said that this might be a good opportunity to explore this option, and Litchfield concurred with Wills and Norris. Barton clarified that so far, Canadian representatives had not stated a preference for when to make the releases out of Libby in August and encouraged the Salmon Managers to think about the best operations for Libby releases. Barton acknowledged that offline coordination amongst the Action Agencies would need to occur between now and discussion of this option at next week’s TMT meeting and offered to answer any questions from the Salmon Mangers offline over the next couple of days as well. Litchfield again stated that Montana’s concern is for a gradual ramp down in flows; Barton said that so far it seemed as though the timing assumed in the models was acceptable to Montana and Litchfield agreed.

Action/Next Steps: The COE will run some models for this option as soon as possible and updated graphs for Libby Operations will be posted to the web for TMT to review prior to the 6/2 TMT meeting.

The group then turned their attention to SOR FWS #2010-01, regarding Sturgeon Pulse operations at Libby dam. At the last TMT meeting, Dave Wills, USFWS, provided a brief outline of the SOR and asked that TMT review the material and bring any questions/concerns with them to today's meeting. Jason Flory, USFWS, said that based on the latest data, it is likely the operation would begin the second week of June as river temperatures need to rise some before the SOR can be implemented. TMT members asked clarifying questions regarding operational triggers, flows and scheduled repairs at the dam. Paul Wagner asked Flory if the operation would proceed if not all of the conditions listed in the SOR were satisfied in the next couple of weeks; Flory said no, but the sturgeon will start spawning regardless. Steve Barton, COE, noted that there is a relationship between the Sturgeon Pulse start date and its effect on how and when the stored 260 KAF is released. TMT members were asked for their thoughts on the operational triggers as laid out in the SOR. An informal poll was taken:

- MT- Concerned about descending limb as described in SOR, wants reasonable ramp down from the pulse. Is concerned with effects of operation on aquatic life below the reservoir as well as storing as much water as possible and am not authorized to weigh in on the SOR at this point.
- ID- Supports the SOR.
- WA- Supports the SOR
- NOAA- Supports the SOR
- USFWS- Supports the SOR
- Umatilla Tribe- No objection
- BOR- No objection
- BPA- OK
- COE- Supports the SOR.
- Colville Tribe- No objection

Action/Next Steps: This item will be on the agenda for the TMT meeting on 6/2; TMT will discuss updated data and assumptions for the start date for the Sturgeon operation.

Dworshak Operations

Steve Barton, COE, reported on recent operations for May 19-21st; the dam released full powerhouse flows as described in the SOR. He reported the peak flow out of Lower Granite was 106 kcfs on May 20th, averaging 100 kcfs while coinciding with the natural flow peak. Paul Wagner, NOAA, reported that an increase in passage was observed at all Snake River projects and was in fact, quite substantial in some places. TMT reviewed passage data posted on the Fish Passage Center site; it appeared fish were indeed in the reservoir as hoped and these assisting flows, which coincided with the natural peak, were just the queue they needed to migrate out of the area. Barton and Wagner concurred that it was a well-executed and successful SOR. Steve Hall, COE, shared that strictly based on the latest water supply information Dworshak may barely fill, with only about 6 KAF

of surplus. Filling will of course depend on actual inflow which is likely to be different than the current water supply value.

Action/Next Steps: The COE will share updated modeling and the June forecast at the 6/2 TMT meeting.

Priest Rapids Flow Objectives

Paul Wagner NOAA, shared that this issue was discussed at FPAC on 5/25. He reported that passage of wild Sockeye at Rock Island is way up and Steelhead numbers were quite good as well. Based on data from the Fish Passage Center site, the FPAC consensus is to hold the current objective of 125-135 kcfs though next Wednesday 6/2. Fish movement, forecasting etc will be revisited at that time to determine next steps. Wagner also reported that moving to a McNary flow objective (as suggested by Tony Norris, BPA) was also discussed at FPAC and the early sentiment of the group did not favor this operational change at this time. Norris noted that operating to a weekly average discharge as opposed to a daily flow objective is preferable.

Action/Next Steps: Priest Rapids will be operated flow objective of 125-135; the Action Agencies will manage the project in a way that provides the best chance at meeting Grand Coulee refill while staying in that flow range for the weekly average. This issue will be discussed at the TMT meeting on 6/2.

Treaty Fishing Summary

Tom Lorz, CRITFC, reported that the recent Treaty Fishing season lasted two weeks. Two SORs were issued for that time period during which Bonneville, John Day and The Dalles were all held to a 1.5' band. He clarified that operations were actually closer to a 1' band, which historically has been more desirable. No issues were reported.

Action/Next Steps: Lorz will report final catch numbers at the 6/2 TMT meeting.

Hanford Reach Summary

Russell Langshaw, Grant County PUD, directed TMT to a link posted to the agenda. He updated the group on the past two weeks of operations: the daily delta constraints were 30-60 kcfs, averaging 40 kcfs. Priest Rapids mean daily delta was 129.41 with a minimum of 112.35 and a maximum of 150.5. The mean daily minimums ranged from 105.9-138.2 and averaged 114.4. The maximum was 144.5. The actual daily delta was 30.1 ranging from 14.5-39.3. Langshaw noted that the increase in flows were not as large as expected. He reported that current temperature units are at 220 and that protection flows will end when 400 temperature units are reached. As temperature units accumulate at a rate of approximately 11 per day, protection is expected to continue for a couple more weeks.

Action/Next Steps: Langshaw will update TMT at the 6/9 meeting.

Operations Review

Reservoirs: Grand Coulee was at elevation 1264.4' and meeting Priest Rapids objectives of 125-135 kcfs. Hungry Horse was at 3537.97', with 4 kcfs outflows and current inflows of around 7 kcfs. Libby was at 2418.33' with inflows of 17.6 and outflows of 14.5 kcfs. Albeni Falls was at 2058.79' with inflows of 34.7 kcfs, and outflows of 30.1 kcfs. Dworshak had inflows of 8.4 kcfs and outflows of 1.3 kcfs. Priest Rapids had 141.4 kcfs outflows (averaging 131.8), Lower Granite had 73.3 kcfs outflows and McNary had 219 kcfs outflows.

Fish: TMT looked at data posted to the Fish Passage Center site. Cindy LeFleur, WDFW, reported on Adult passage: the cumulative Spring Chinook count at Bonneville is 232,000 with daily passage below 1,000. She noted that the forecast calls for a strong run at over 300,000. She noted that Jacks are on the low side at 11,000. Paul Wagner, NOAA, reported that it was determined that the variable operation of the spillway weir at Little Goose appears to be an impediment to passage. The day the weir was taken out of service (to change from high to low crest position) 10,000 fish passed. Adult counts then fell when the weir was re-opened. It was then turned back off and another 10,000 fish passed. The weir is currently shut off and spill is in a uniform pattern. It is scheduled to be turn back on Thursday afternoon 5/27, which should take 1-2 hours. The River Forecasting Center is predicting flows of 90 kcfs which will hopefully be enough to not delay adults. Russ Kiefer, ID, added that this issue of passage delay between Little Goose and Lower Monumental needs to be resolved; an operation needs to be determined that is good for both adults and juveniles. The Salmon Managers will try to avoid making recommendations to the COE for more than one operational change per week.

Action/Next Steps: The spill way weir operation at Little Goose will be revisited early next week and Wagner will report back to TMT on 6/2.

Power: Tony Norris, BPA, reminded TMT of a recent transmission limitation. He reported that the limitations were resolved.

Water Quality: Scott English, COE, reported that all gauges are working well and that there were no exceedances this week.

The next TMT meeting will be: a face to face meeting on 6/2 at 9:00 am at the COE.

Agenda items will include:

- Notes Review
- Libby Operations Update
- Dworshak Operations Update
- Priest Rapids Update
- Operations Review

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

May 26, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT meeting, held at Spring Creek National Fish Hatchery, was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the USFWS, COE, BPA, BOR, CRITFC, Montana, Washington, Idaho, the Colville tribe 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 provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for May 12, 17 and 19

May 12 facilitator's notes: Halton reported that Steve Hall (COE) has edits:

- *Page 3, second paragraph* – "...the cost of running outflows at full powerhouse (about 10 kcfs) for three days is that the pool would end up 3 feet lower than it otherwise would have" replaces "...would draft 3 feet."
- *Page 3, third paragraph, middle* – "The COE cautioned that the pool elevation at Brownlee has been decreasing" replaces "...releases out of Brownlee were decreasing."

With these changes, the May 12 facilitator's notes will be considered final. There were no edits today to the facilitator's notes for May 17 and 19, or to the official minutes for May 12, 17 and 19. They are all considered final.

3. Libby Spring Operations – Storage Accounting and SOR-FWS #2010-1

Joel Fenolio and Jeremy Giovando (COE Seattle) discussed SOR-FWS #2010-1 with TMT. The SOR has been posted on the TMT web page for review since last week's meeting. It describes Libby operations during the ascending limb, peak, and descending limb of the 2010 sturgeon pulse. The descending limb was a focal point of concern in TMT's discussion today.

As of yesterday, the 260 kaf of the Phase 2 Libby operation was stored in the reservoir, Giovando reported. Attachment 3b to today's agenda depicts storage volumes in Libby reservoir over time under the deviation request compared to what it would have been under the VARQ operation. The reservoir is headed toward 2,419 feet elevation, while under the VARQ operation the reservoir would only be at elevation 2,411 feet, Fenolio said. The COE will maintain the 260k storage until either the sturgeon pulse begins or starting next week, with a commitment to flow neutrality by the end of June.

Inflows to the project have dropped off recently, probably due to a combination of cooler temperatures and less snowpack than usual. When temperatures finally rise, inflows will probably rise again. The 10-day inflow forecast depicted in attachment 3b is a deterministic forecast. The daily hydrograph used in the graph may be lower than the COE's official inflow forecast. Regardless of inflow traces, the COE is committed to release 260 kaf of storage from the reservoir by the end of June. Refill of Libby reservoir this year looks unlikely, Fenolio said.

Montana is concerned about whether it will be possible to maintain an operation that ramps down gradually after the sturgeon pulse ends, Jim Litchfield (Montana) said. Will there be enough volume for the sturgeon flows and a gradual ramp down, then reservoir refill by the end of June? The sturgeon pulse is triggered by a confluence of environmental conditions including water temperature and spawning behavior that's difficult to predict. Lack of a specific date raises concerns about a steep drop in outflows toward the end of June.

There may be an opportunity with B.C. Hydro to supplement flows at Grand Coulee with releases from Arrow Dam in June, Barton announced. The swap arose as a possibility yesterday and could be mutually beneficial. It has the potential to allow all or part of the 260 kaf release to be pushed into summer without affecting the flow neutrality of Grand Coulee this spring. The same volume would be released at Arrow instead of at Grand Coulee. Barton asked TMT members to start thinking about this possibility. The Action Agencies still need to coordinate their own responses to the swap internally, and it might not even be in the best interest of the Northwest to pursue. It's important to avoid the kind of conversations that arose over the 2008 Libby-Arrow swap, Tony Norris (BPA) recalled. What's needed this time is mutual understanding of prospective benefits, including the timing of releases from Arrow. The COE will develop graphic comparisons of alternatives to aid in the decision-making process for use at next week's meeting.

Jason Flory (USFWS) led a discussion of the sturgeon pulse SOR, attachment 3a to today's agenda. With cool temperatures in the Kootenai forebay all the way to Bonner's Ferry, and a forebay elevation below what's needed to spill 10 kcfs, the sturgeon pulse probably won't start until the second week of June, Greg Hoffman (COE Libby) said. The reservoir is currently at elevation 2,418 feet, creeping upward slowly. The temperature at Bonner's Ferry – an indicator of when the sturgeon pulse should start at 8 degrees C – is 7.5 degrees C today. Paul Wagner (NOAA) asked if there's a date when the sturgeon pulse would start regardless of the triggers. Eventually, river temperatures will rise to a point where sturgeon spawn regardless of reservoir operations, so there's no sense in withholding releases if the bulk of sturgeon spawning is already done, Flory said. If inflows drop below VARQ flows of 14.5 kcfs, the COE would reduce discharges rather than draft the reservoir to meet VARQ, Fenolio said.

Barton asked for people's initial thoughts on the recession limb as depicted in attachment 3b, which reflects the COE's commitment to release all Phase 2 stored water by June 30. The descending limb of the sturgeon operation will probably be steeper than currently projected, Fenolio noted.

The SOR and its associated triggers can be distinguished from disposition of the stored 260 kaf and TMT's outstanding agreement to revisit the end of June deadline for its release, Barton pointed out. If it appears the sturgeon pulse will crowd the end of June target, the COE will probably begin releasing the 260 kaf before the sturgeon pulse begins. With these caveats, TMT members gave the sturgeon recovery team their views of the SOR:

- **Montana** – Undetermined variables, mainly lack of a start date and the resulting lack of a clearly defined descending limb, make it impossible for Montana to either support or oppose the SOR until more definite information is available. The problem is not the sturgeon pulse itself, which has followed the same triggers for years, but commitment to release the stored 260 kaf by June 30, which could create ramp-down problems if the sturgeon pulse starts late.
- **Idaho** – Supports the SOR.
- **Washington** – Supports the SOR.
- **BOR** – No objection.
- **BPA** – No objection.
- **COE** – Supports the SOR.
- **CRITFC (for Umatilla Tribe)** – No objection.
- **Colville Tribe** – No objection.

TMT will revisit this issue at its next meeting June 2, with more detailed information from the COE on both the sturgeon operation and the Canadian proposal for a Libby-Arrow swap.

4. Dworshak Operations

From May 19-21, Barton reported, Dworshak Dam released full powerhouse flows, with a peak discharge of 106 kcfs from Lower Granite on May 20, as coordinated via SOR 2010-2 at TMT last week. The resulting juvenile steelhead index counts of 120,000 at Lower Granite on May 21 and 180,000 at Little Goose, followed by another 100,000 juvenile steelhead on May 21 confirm that the fish were in the reservoir as presumed, waiting for a cue to migrate. There could be more fish to come this week, with flows expected to be 90 kcfs at

Lower Granite. There was general consensus that SOR 2010-2 was carried out well and benefited fish.

Russ Kiefer (Idaho) explained that, with CRFM improvements on the Columbia, actual smolt passage numbers are higher now than index counts. Addition of surface weirs in recent years has increased the effectiveness of spill, which produces higher passage numbers. Index counts therefore give a good indication of run timing but not actual abundance. Wagner agreed the estimates of actual passage involve a lot of uncertainty.

5. Priest Rapids Flow Objectives

Yesterday FPAC discussed flow objectives for Priest Rapids Dam and wrestled with a lack of information regarding inflows, Wagner reported. Wild juvenile steelhead and sockeye passage numbers at Rock Island Dam are way up. Efforts are underway in Canada to improve the natural production of sockeye. In light of these high passage numbers, FPAC members agreed to stick with their current recommendation of 125-135 kcfs flows at Priest Rapids, at least until TMT meets again on June 2. A recent STP inflow trace suggests that maintaining flows of 125 kcfs is possible while still refilling Grand Coulee this year.

Tony Norris (BPA) recalled his suggestion at the May 19 TMT meeting to switch the focus from Priest Rapids to McNary discharges. If the focus remains on Priest Rapids, an objective of 130 kcfs might be a little high. Shifting down to 125 kcfs would work, Wagner said, but the Salmon Managers didn't want flows to go below 125 kcfs, given that passage is still occurring at mid Columbia projects.

TMT members informally exchanged their views of the Priest Rapids operation:

BOR – There's a tradeoff involved in providing 125-130 kcfs next week at Priest Rapids. It could either mean a more precipitous drop in flows at Priest Rapids and McNary later, or not refilling Grand Coulee.

BPA – In terms of a planning horizon for the Priest Rapids flow objective, a Monday-Sunday weekly average is more sustainable than a daily average. A decision not to refill Grand Coulee as a result would involve BiOp and legal policy issues. Switching to a McNary objective now could give the Action Agencies greater ability to manage Grand Coulee refill and take advantage of precipitation events – relevant because precipitation is expected to rise over the next 10 days. Depending on the shape of runoff, expects reductions of 10-20 kcfs in McNary flows the following week as the Action Agencies transition to refill.

NOAA – Wants feedback from the Action Agencies on relative risks and the effects on Grand Coulee operations of the Salmon Managers' request for flows of 125-135 kcfs at Priest Rapids. Recognizes that Grand Coulee might not refill this year as a result –3 feet less volume in the reservoir is not a precipitous drop.

CRITFC/Umatilla Tribe – Supports NOAA's position.

COE – The COE will evaluate the risks involved to see if they trigger policy issues that need to be discussed.

Colville Tribe – Fish passage numbers are increasing, so it's a good idea to keep flows at 125-135 kcfs for now. Hopefully, the oncoming precipitation will help. If Grand Coulee misses its refill elevation, that would be all right down to 1,288 feet. End of June elevations below 1,280 feet usually mean hitting the reservoir too hard later in order to provide summer flows.

6. Treaty Fishing Summary

Two SORS for the fisheries requested minimum fluctuations of 1.5 feet at the Bonneville, John Day and The Dalles pools, with no reports of fishing problems, Tom Lorz reported. Fluctuation ranges were closer to a foot as historically requested, which was appreciated. CRITFC is summarizing total catch numbers for the 2010 fishing season and will provide final counts at the June 2 TMT meeting.

7. Hanford Reach Summary

Russell Langshaw (Grant PUD) summarized the Priest Rapids Dam operation over the past 2 weeks. Daily deltas were 30-60 kcfs, and mean daily discharges were 129.4 kcfs. Minimum flows were 112.3 kcfs and maximums were 150.5 kcfs. Mean daily minimums averaged 114.4 kcfs, ranging from 105.9-138.2 kcfs. Daily maximums averaged 144.5 kcfs, ranging from 122.6-159.1 kcfs. Actual daily deltas averaged 30.1 kcfs, ranging from 14.5-39.3 kcfs. The operation is 220 temperature units from the end of emergence. That means probably another couple weeks of protection flows. Langshaw will give another update at the June 9 TMT meeting.

8. Operations Review

a. Reservoirs. Grand Coulee is at 1,264.4 feet elevation, discharging to meet the Priest Rapids flow objective of 130 kcfs. Coulee inflows next week are projected to be flat. Hungry Horse is at elevation 3,537.07 feet, 22 feet from full, with outflows of 4 kcfs which will continue until the weather warms. Inflows peaked at 20 kcfs a few days ago, then dropped when snowmelt stopped. Inflows are expected to pick up again in the next few days. Libby is in a similar situation, with 17.6 kcfs inflows as compared to a peak inflow of 37.9 kcfs on May 19 before the cold spell hit. Libby is discharging VARQ flows of 14.5 kcfs. Elevation is 2,418.33 feet.

Albeni Falls inflows are 34.7 kcfs, outflows 30.1 kcfs, with a reservoir elevation of 2,058.79 feet. Dworshak inflows are 8.4 kcfs, with 1.3 kcfs

discharges. The powerhouse discharge operation requested in SOR 2010-2 for 3 days coincided with the natural inflow peak. Priest Rapids is releasing 121.4 kcfs today, with an average of 131.8 kcfs for the week ending May 23.

McNary outflows are 219 kcfs. Lower Granite peak discharge was 106 kcfs on May 20; now it's 73.3 kcfs.

b. Fish. Adults: At Bonneville, the cumulative counts are 232,000 spring Chinook adults, with daily counts dropping below 1,000 last week and rising again this week, Cindy LeFleur (Washington) reported. The predicted spring Chinook run size is 315,000 at the river mouth, 67% of the preseason forecast of 470,000. Jack counts are at 11,000 so far this year, compared to 80,000 last year, which was phenomenally high.

A disparity of some 20,000 adults between Lower Monumental and Little Goose for a few days suggested a problem, Kiefer and Wagner noted. So the Little Goose spillway weir was changed to the low crest position to allow greater volumes to pass over the weir. When it went out of service for a day, 10,000 fish passed Little Goose. This problem seems to arise when flows over the weir are less than 70 kcfs. It's a tradeoff between juvenile and adult passage, with juveniles benefiting from the weir at the expense of adults. The passage index assumes 1:1 but collection efficiencies suggest it's closer to 5:1, or 5 fish passing for every fish detected.

Juveniles: The uptick of yearling Chinook passage occurred on May 18 which is also when flows increased, Wagner reported. The data suggest that 2010 passage is similar to 2007, another low flow year, with a lot of fish passing undetected. Steelhead passage at Lower Granite to date is lower than 2007, which suggests either that the fish have already passed the project or haven't yet arrived. The mystery won't be resolved until passage is over.

Spill patterns over the Little Goose weir that delay adults need to be studied in the search for an operation that doesn't benefit one age group at the expense of another, Kiefer said. On the afternoon of May 20, the COE put the Little Goose surface weir back into operation to boost adult passage, at the Salmon Managers' request, Kiefer said. Work is in progress to develop a spill pattern that aids juvenile migration without delaying adults. Kiefer and Wagner will give an update at the next TMT meeting on plans to use the surface weir at Little Goose over the next few weeks.

Doug Baus (COE) asked whether FPAC likes the process in place for operating the Little Goose weir, or do they envision changes? The process seems to be working well, Kiefer said. There will be more discussion of how to manage the changes from high to low crest position in ways that meet the needs of both juveniles and adults. Charles Morrill (Washington) agreed the process is working well. TMT will revisit this issue at its next meeting June 2.

Power. Last week BPA emailed TMT members regarding transmission limitations that were affecting BPA's ability to move generation where it needed to be, Norris reported. Since then, the transmission limitations have been resolved and no further limitations are expected.

Water Quality. All gages are working well, and there have been no exceedances over the past week, Scott English (COE) reported.

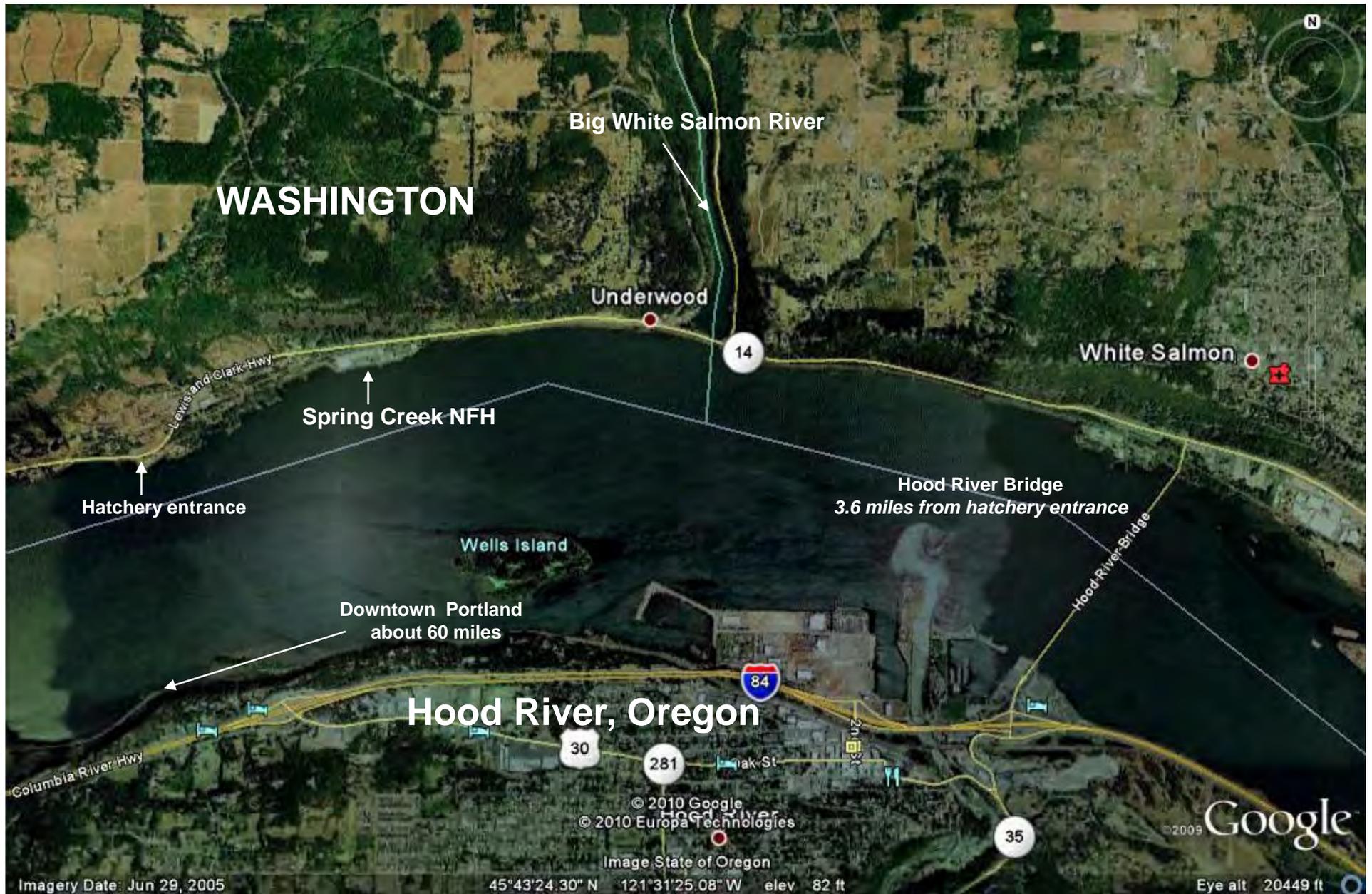
9. Next Meeting

The next TMT meeting will be June 2 in Portland. The agenda will resemble today's agenda, with updated information and graphs on Libby operations provided by the COE.

Name	Affiliation
Charles Morrill	Washington
Russ Kiefer	Idaho
Paul Wagner	NOAA
John Roache	BOR
Tony Norris	BPA
David Wills	USFWS
Tim Heizenrader	Centaurus
Steve Barton	COE
Doug Baus	COE
Scott English	COE
 <u>Phone:</u>	
Cindy LeFleur	Washington
Tom Lorz	CRITFC
Jim Litchfield	Montana
Bill Rudolph	NW Fish Letter
Shane Scott	PPC
Glen Trager	Shell Energy
Dave Benner	FPC
Russ George	WMC
Karl Kanbergs	COE
Jason Flory	USFWS
Joel Fenolio	COE
Jeremy Giovando	COE Seattle
Greg Hoffman	COE Libby Dam
Greg Lawson	Point Carbon
Rob Allerman	Deutsch Bank
Tom Le	Puget Sound Energy
John Hart	EWEB
Scott Bettin	BPA
Russell Langshaw	Grant PUD
Steve Barton	COE
Sherry Sears	Colville Tribe

Steve Hall
Greg Hoffman

COE
COE







Please take note of the road construction on SR 14 on both the east and west sides of the hatchery. The hatchery is at about milepost 62 on SR14.

Current closures:

- WEST of hatchery - Dog Mountain (milepost 54): Full CLOSURE of SR 14 between the hours of 9 a.m. and 11 a.m., Monday through Friday, May 17-21. There is one lane of traffic before and after the closure with about 20 minute delays.
- EAST of hatchery - White Salmon (milepost 64): Full CLOSURE of SR 14 between the hours of 7 a.m. and 4 p.m. Wednesday through Friday, May 19-21. Local detour in place. The detour is 6-7 miles long if you take the Dock Grade Road west of the Hood River Bridge on SR 14. It goes up a ways on SR 141 and then follows the White Salmon River back to SR 14. Plan on an extra 15-20 minutes of scenic driving. Detour map is below. If you were to continue on up SR 141 it takes you to Trout Lake and Mt. Adams.



Coming up Interstate 84 to Hood River seems the best bet.

The following web site goes into details on the road closures on SR 14 and updates for the following week every Friday at 5 PM: <http://www.wsdot.wa.gov/projects/sr14/rockfallmitigationwhitesalmon>

I suspect the closure times will be much the same next week, but it's best to check first. They also have a video of blasting rock on the web site !

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday June 02, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

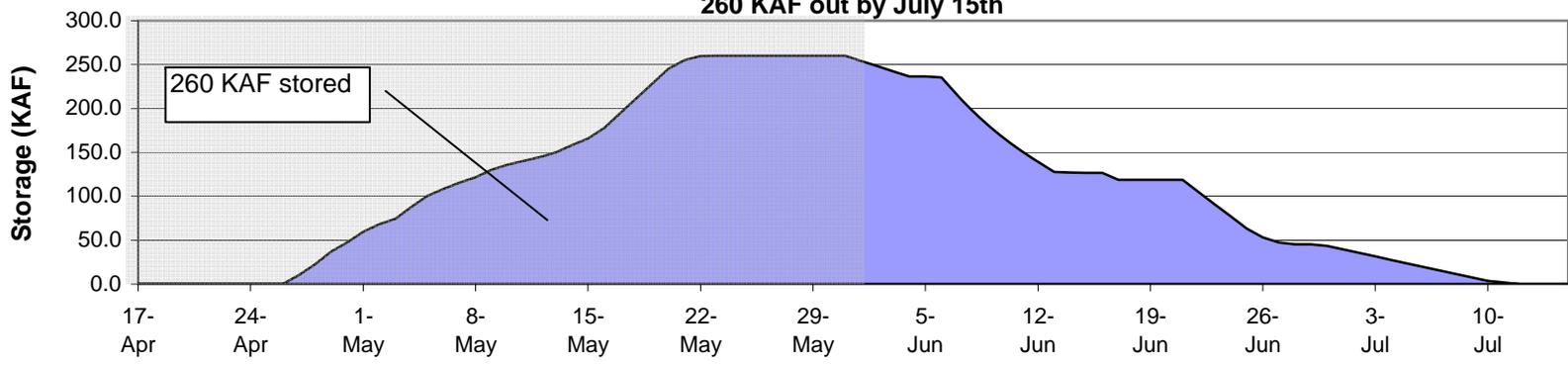
1. Welcome and Introductions
2. Review Meeting Minutes for May 26, 2010 [\[Meeting Minutes\]](#)
3. Libby Operations - Steve Barton, COE-RCC
 - a. [June 30th Accounting](#)
 - b. [July 15th Accounting](#)
4. Dworshak Operations - Steve Barton, COE-RCC
5. Flow Objectives/Transitioning to Refill at Grand Coulee - Paul Wagner, NOAA Fisheries
6. Treaty Fishing Count Totals - Tom Lorz, CRITFC
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 - **June 9, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

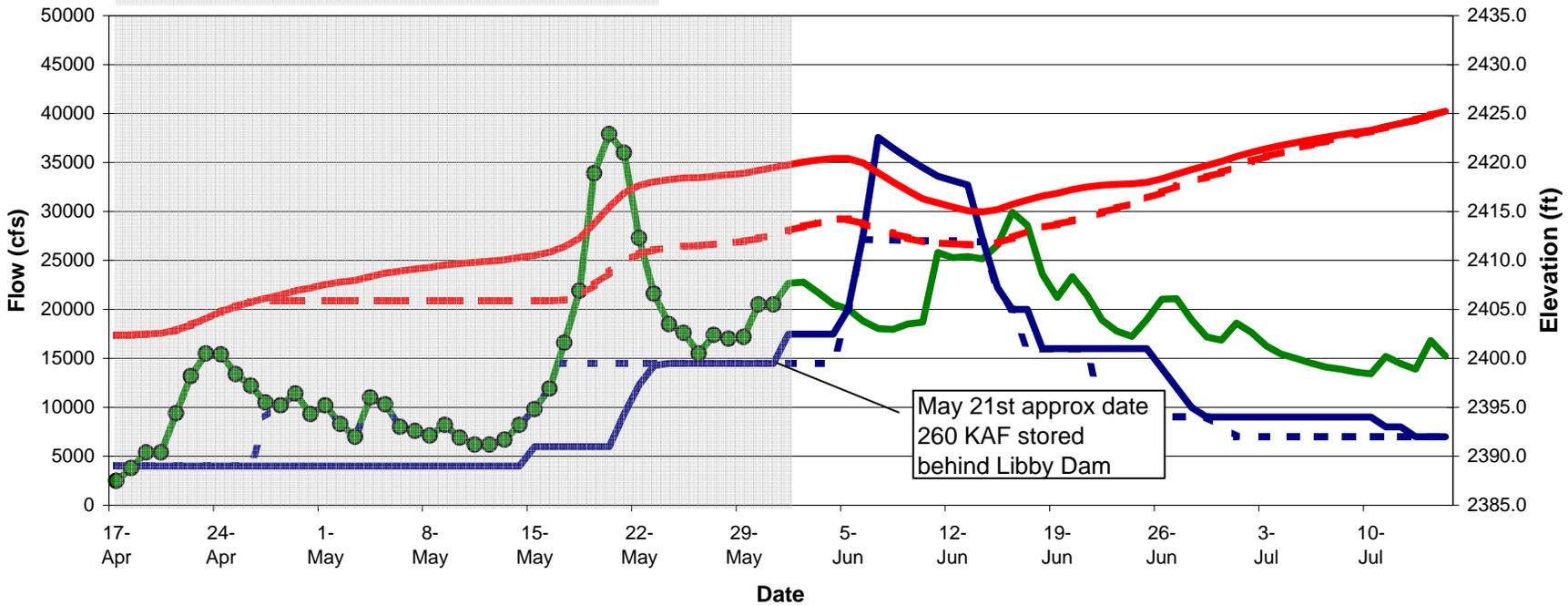
Steve Barton at (503) 808-3945, or

Doug Baus at (503) 808-3995

Libby Dam Deviation Request Accounting 260 KAF out by July 15th

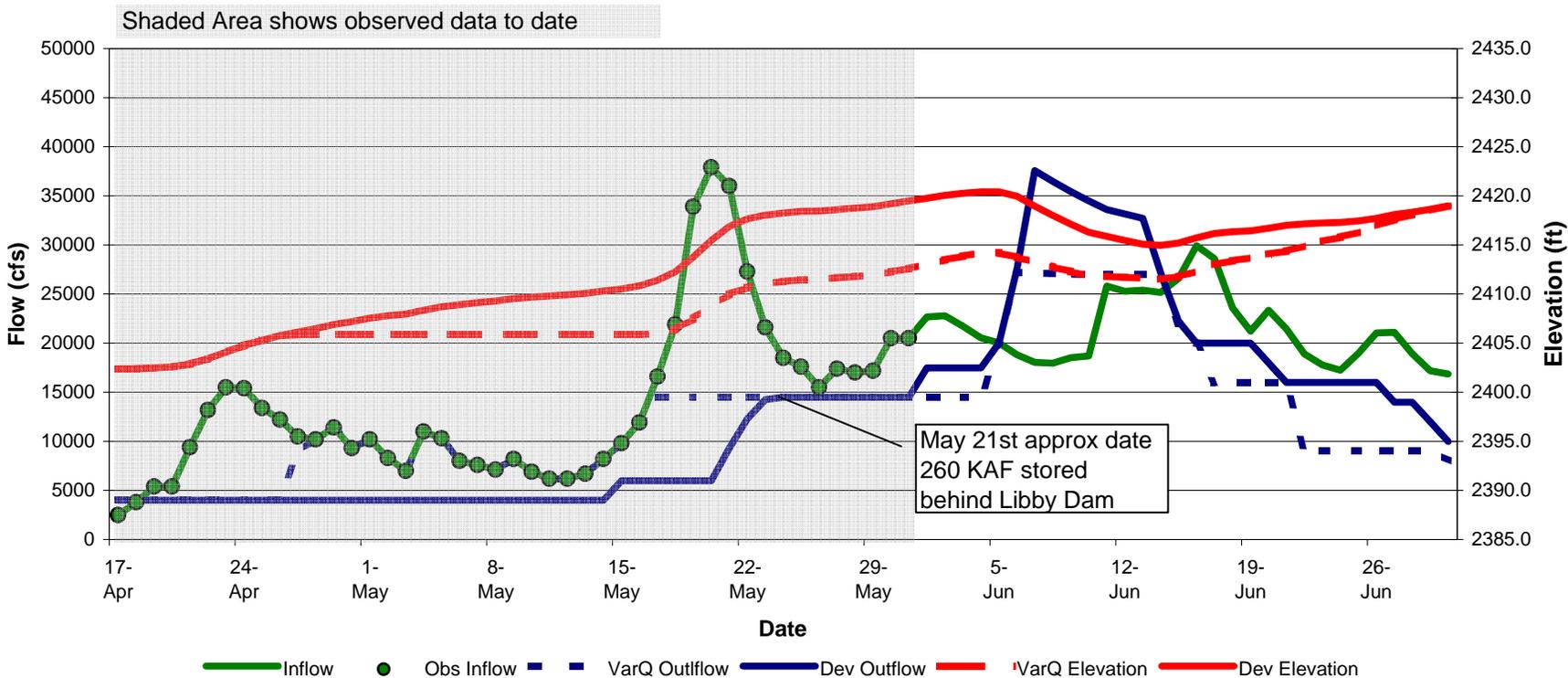
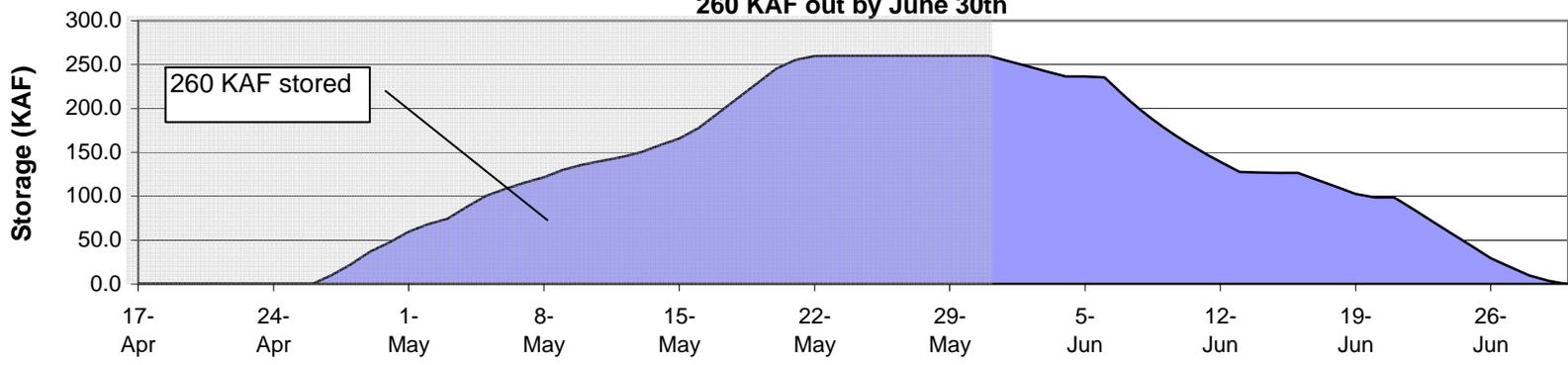


Shaded Area shows observed data to date



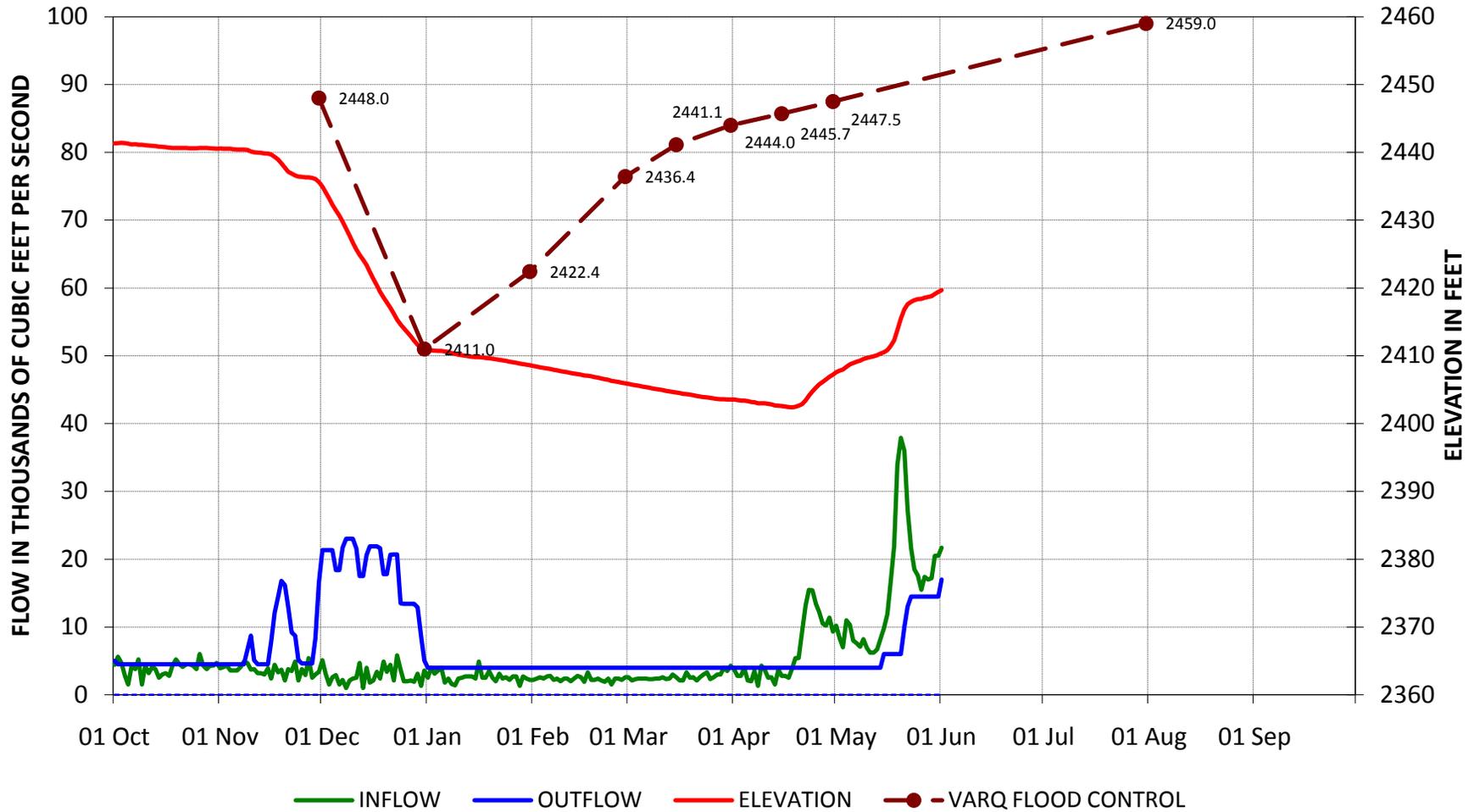
- Inflow
- Obs Inflow
- - - VarQ Outflow
- Dev Outflow
- - - VarQ Elevation
- Dev Elevation

Libby Dam Deviation Request Accounting 260 KAF out by June 30th



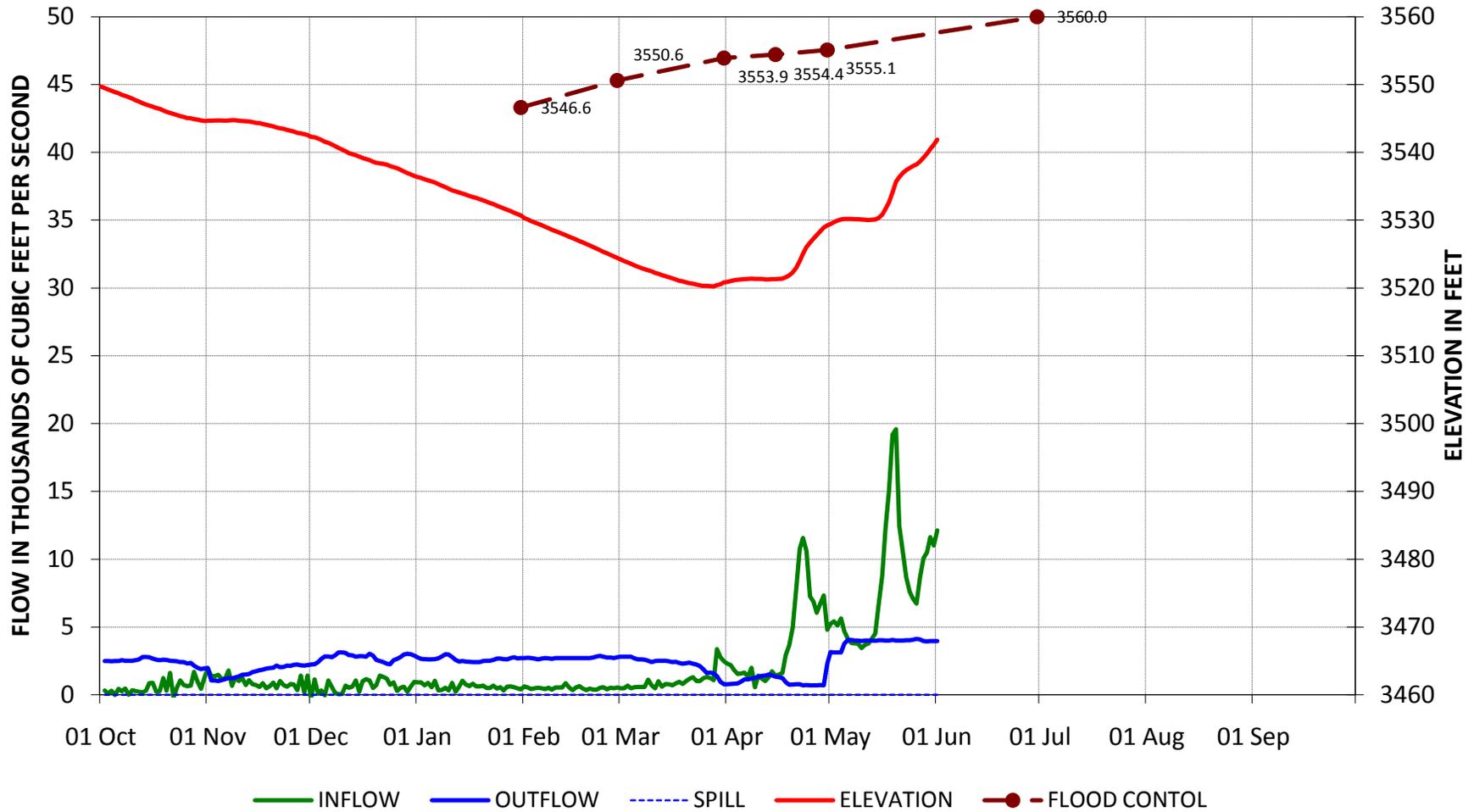
LIBBY DAM AND RESERVOIR

Water Year 2010



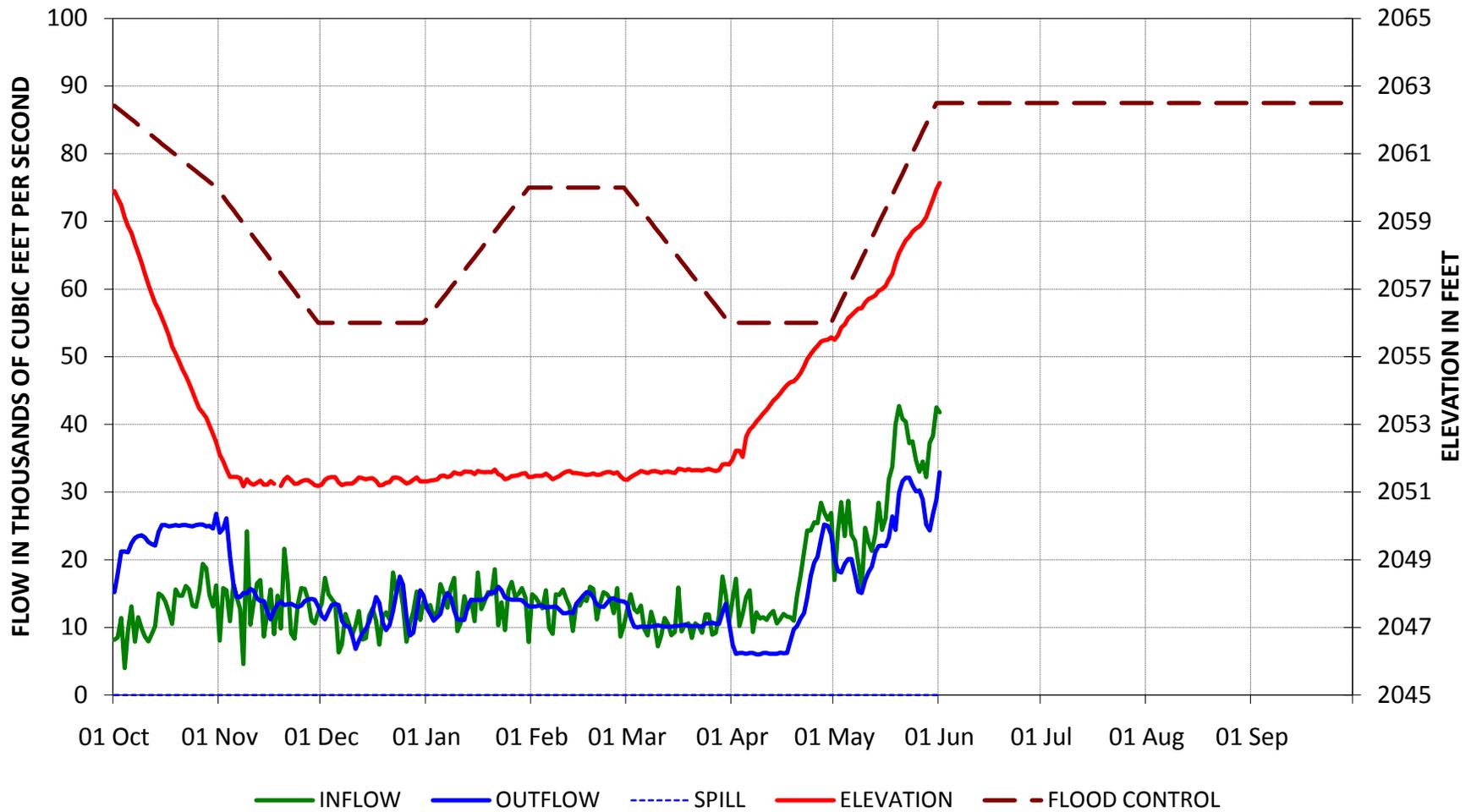
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



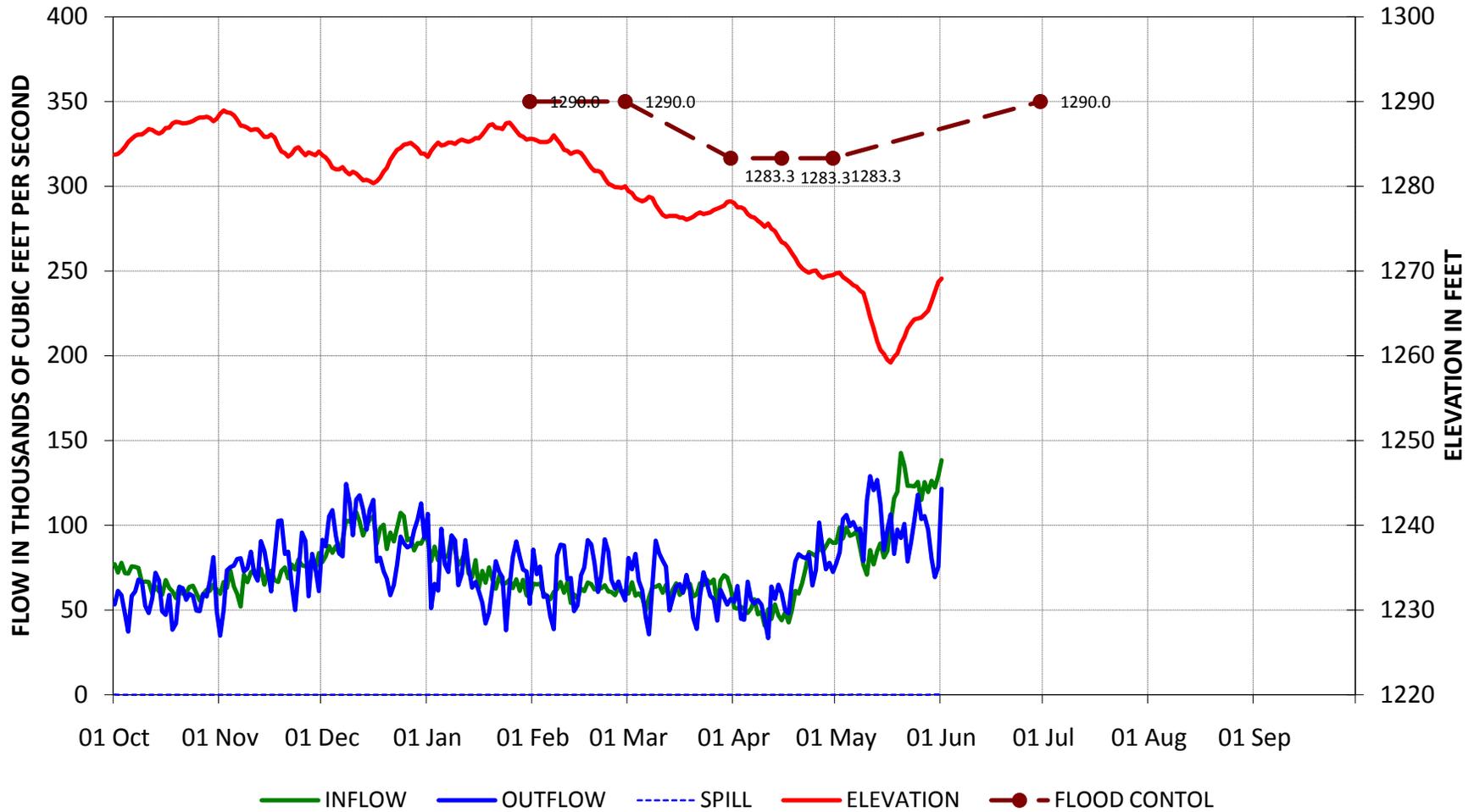
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



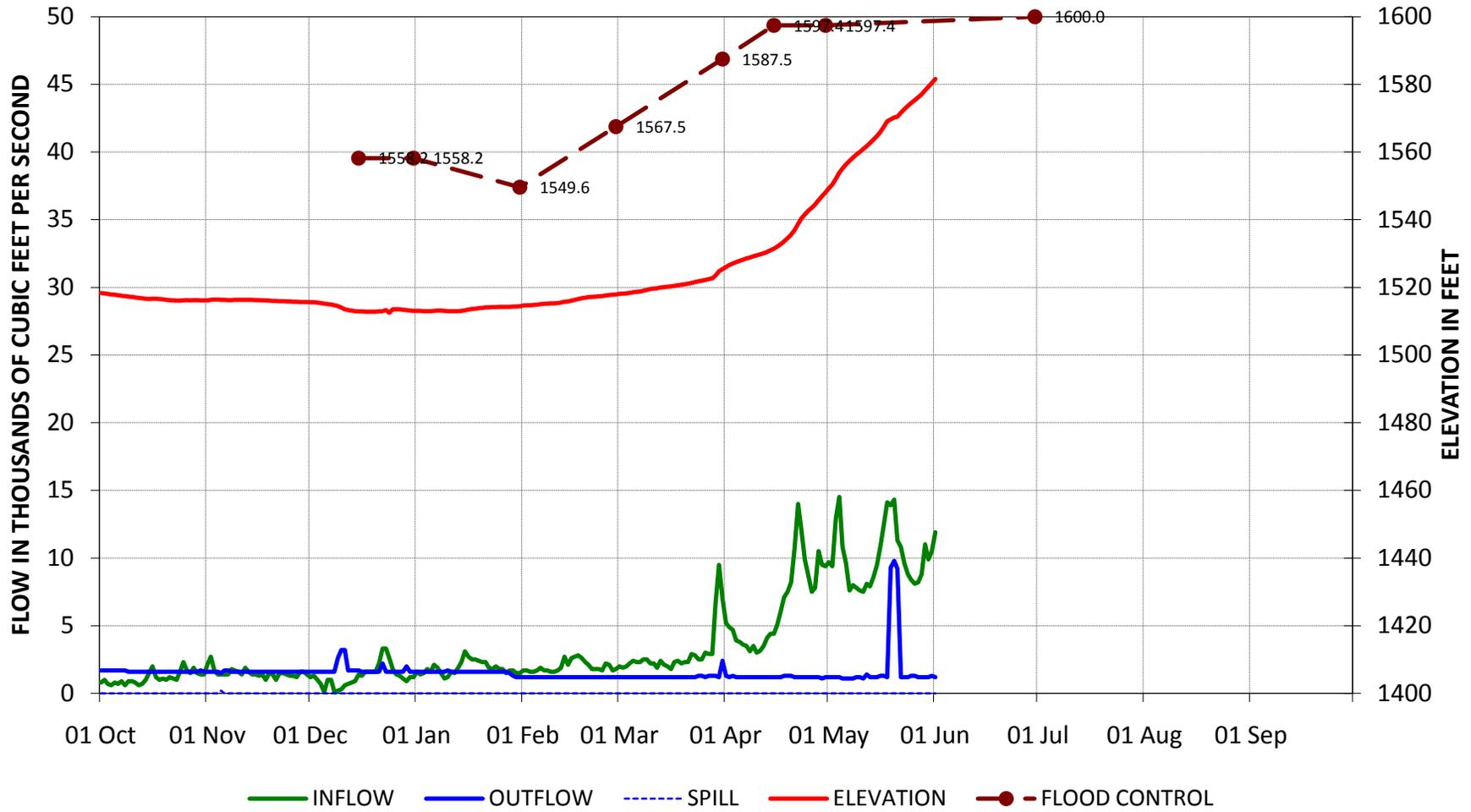
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



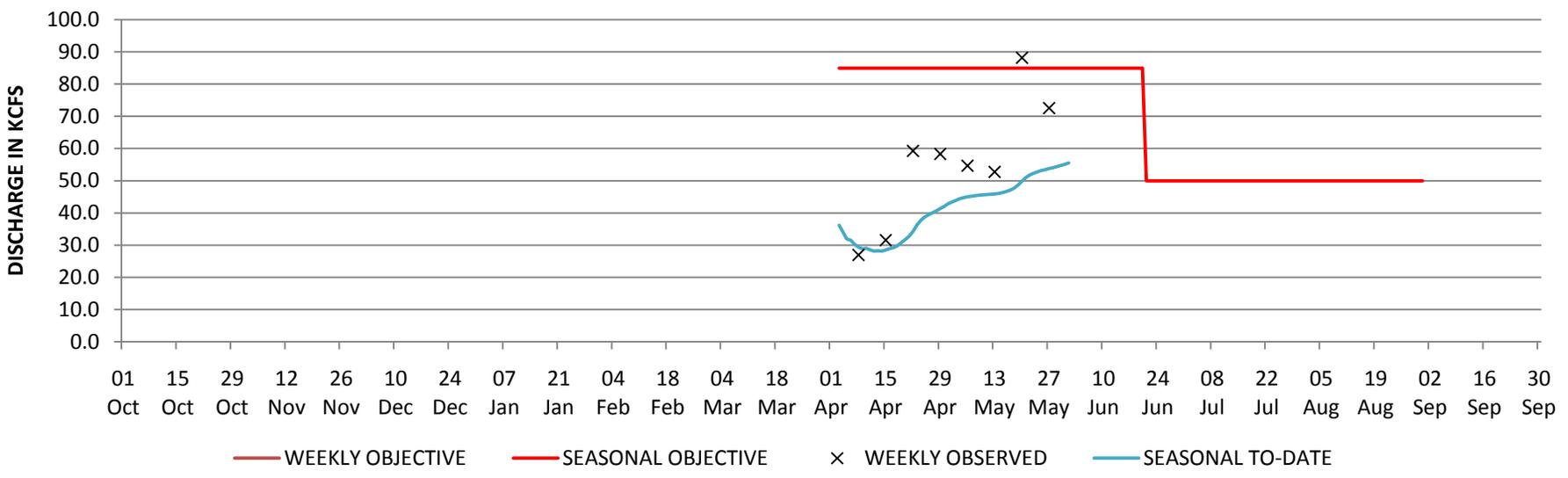
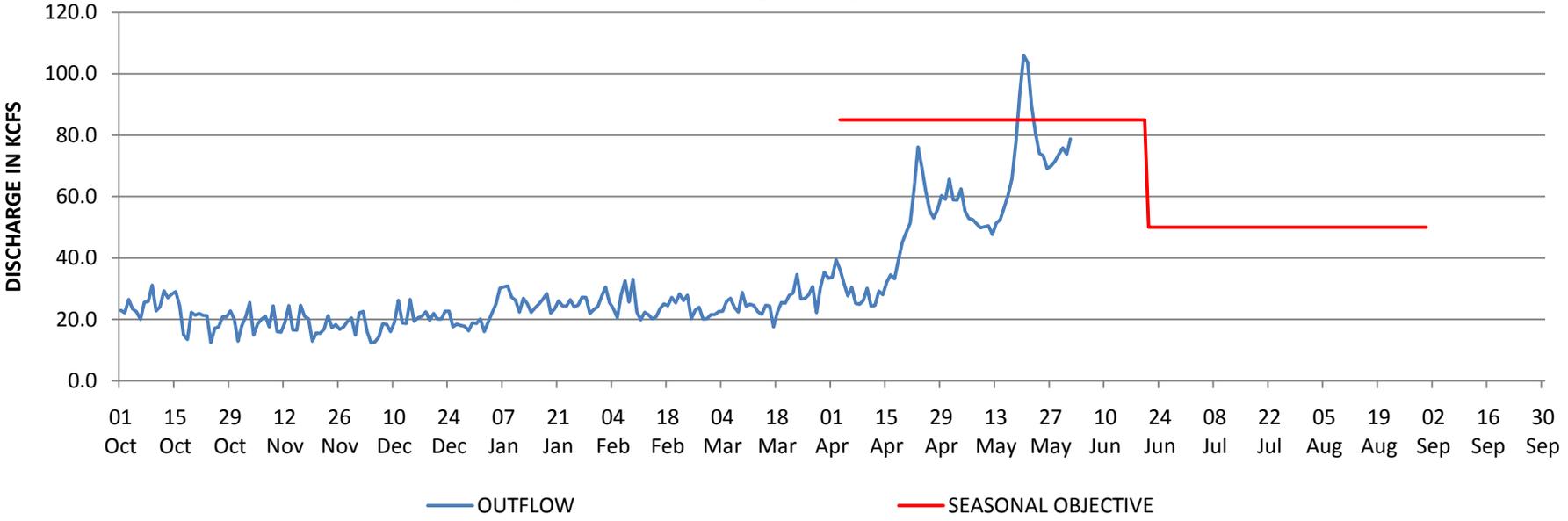
DWORSHAK DAM AND RESERVOIR

Water Year 2010

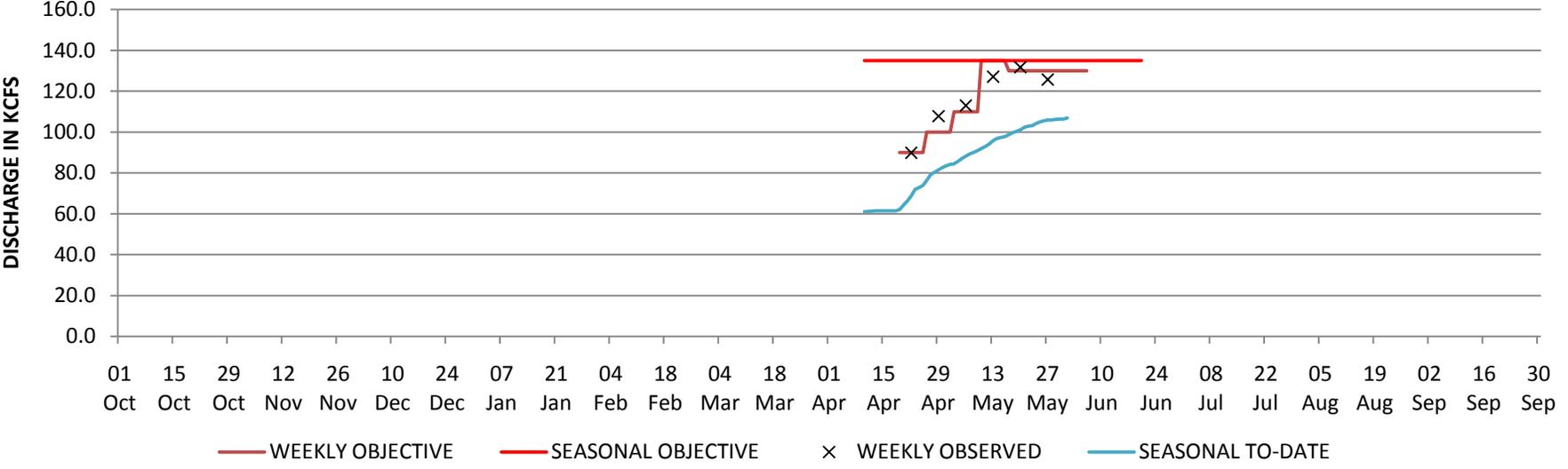
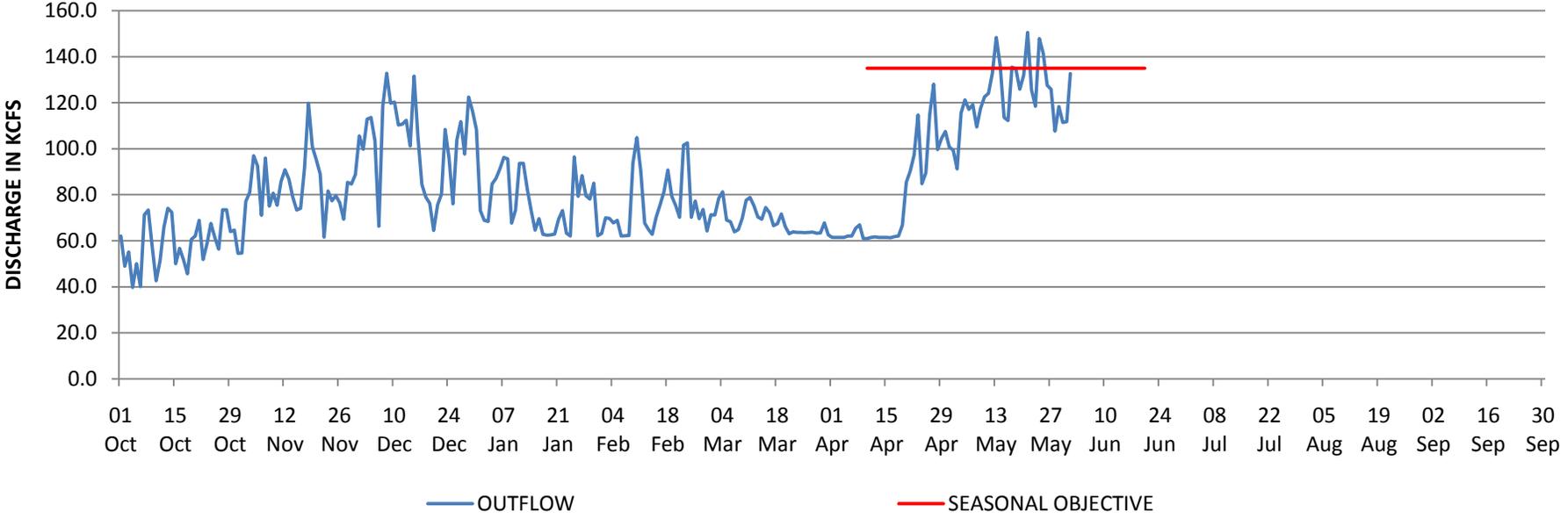


PROJECT DISCHARGE SUMMARY

SNAKE RIVER AT LOWER GRANITE DAM

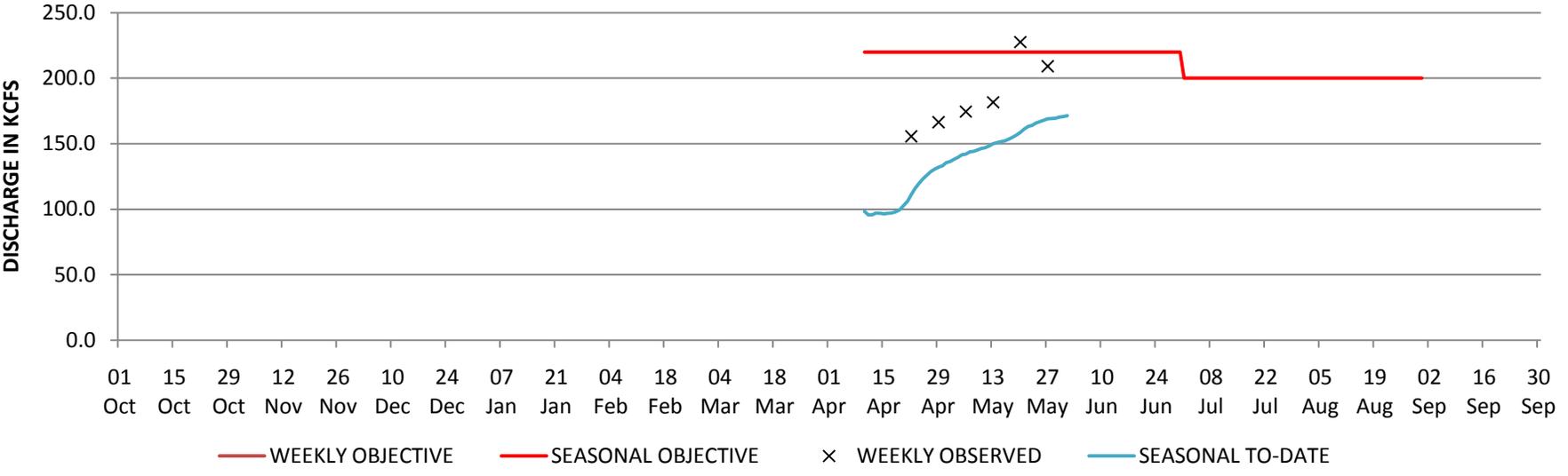
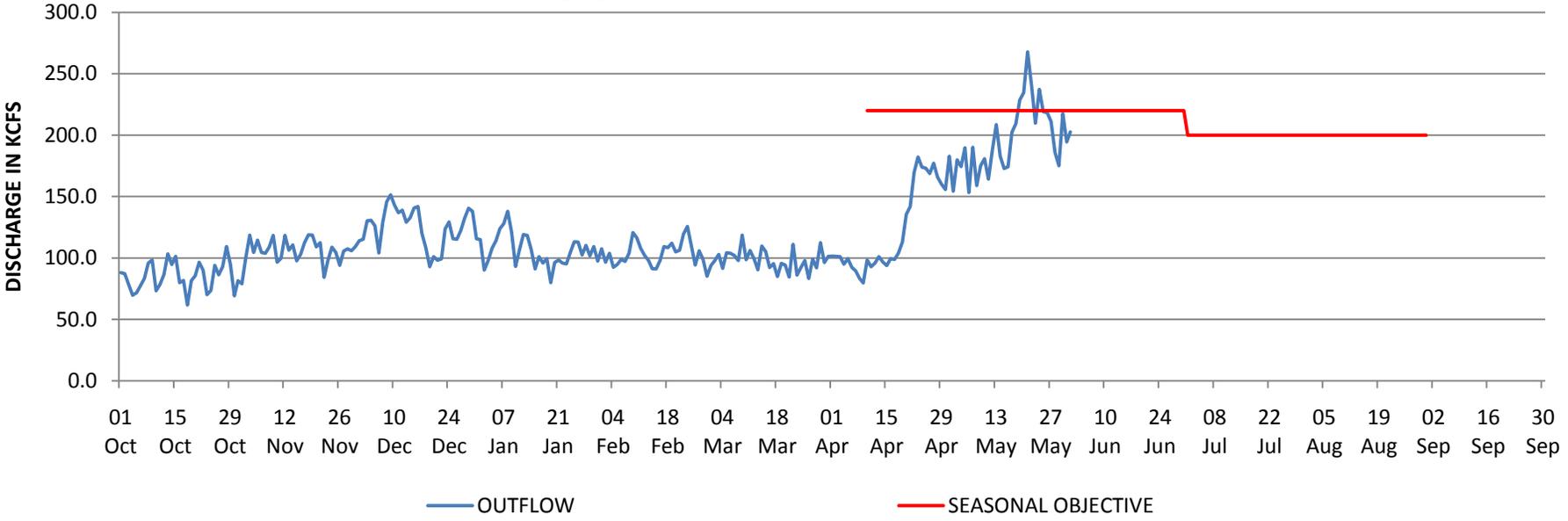


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM



COLUMBIA RIVER REGIONAL FORUM

TECHNICAL MANAGEMENT TEAM

June 2, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

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 May 26, 2010

The Official Minutes and Facilitator Notes had not yet been posted to the web. TMT members indicated the need for more time to review the notes, so it was agreed that both sets of notes from the May 26 meeting would be finalized at the next face to face meeting scheduled for June 16th.

Libby Operations

Steve Barton, COE, shared with TMT that, since the last TMT meeting, discussions with BC Hydro indicated that a swap would not be mutually beneficial, therefore was unlikely and was at this point off the table. The COE provided two scenarios for drafting Libby, which Seattle District's Joel Fenolio and Jeremy Giovando explained in detail. The first scenario would draft 260 KAF out by June 30, with a step-wise ramp down from 20 kcfs to 16 kcfs, then to bull trout minimums (around 7 kcfs) for the remainder of the draft. The second scenario would extend the draft out of Libby, with a shorter period of higher flows up front, and a step-wise ramp down to bull trout minimums into July to release the full 260 KAF by July 15. Fenolio noted that second scenario was a response to a request from Montana to show the descending limb shape if the 260 KAF release was to be extended into July. Fenolio also clarified that last week's graph for Libby had a much higher inflow because last' week's data indicated the precipitation and snow melt would be higher than this week's data were showing.

It was noted that spill for sturgeon would begin next week, per recommendation from the USFWS as advised by the Sturgeon Recovery Team. The COE also explained that the inflow forecast would not impact the operation much, particularly during the sturgeon pulse. Barton clarified that the COE was currently operating to the first scenario, targeting release of the 260 KAF by June 30 as stated in the “Alternative 1” operation agreed to by TMT at the 4/28 meeting. TMT members noted that part of what was agreed to back in April was to re-asses the June 30 date as actual conditions progressed through May. Barton stated that the COE's goal is to blend Libby operations nicely with the sturgeon operation and maintain as much balance as possible for the in-river fish populations. The second scenario would require about a 40 KAF differential in volume. Initial questions and comments discussed by TMT members are summarized below:

- Montana has concern with the first scenario given the steep ramp down during the critical sturgeon incubation period– also need to gather input from the Kootenai Tribe on this option.
- NOAA suggested there may be other ways to shape the flow/manage the ramp down to better meet the multiple needs in the river – this should be the focus for TMT.
- Suggestion: explore the option to make up 40 KAF from Grand Coulee. TMT members agreed that this option would be worth exploring. It was estimated that the 40 KAF would draft Grand Coulee by June 30 by about an additional ¾'. Rick Kruger, OR, stated that they would support drafting Grand Coulee as long as the lower river was made flow neutral.
- Clarification: as to why there is not a “smoother” ramp down, Scott Bettin, BPA, stated that given the lack of volume in the system, and the need to move the water per ramp down rates in the BiOp to support the sturgeon.)
- Clarification: as to what the end of spawning is dependent on and whether it would be possible to shape the water based on those factors, Jason Flory, USFWS, said that spawning is primarily related to the hydrograph and temperature.
- Clarification: as to the potential biological effects on Fall Chinook, the first week of July is a prime migration period at John Day.
- TMT members agreed that it is important to balance the effects of the operation between the upper and lower river.

Action/Next Steps: The COE will model additional scenarios with the suggested use of Grand Coulee to make up for the approximately 40 kaf volume needed to shift the water into July. These scenarios will be shared in time for the FPAC to review them during their 6/7 afternoon call. TMT will revisit the Libby operation discussion during their conference call on 6/9.

Rick Kruger, Oregon, noted that he will not be able to attend TMT next week, but again stated that any operation that is ‘flow neutral’ would be acceptable to Oregon. He will provide input at the FPAC meeting next week.

Scott Bettin, BPA, will email TMT an update with the Sturgeon Recovery Team’s preference for the start of the sturgeon pulse operation, after their meeting tomorrow (6/3).

The COE will also look into the possibility of drafting additional water out of Libby to satisfy the interest in extending the draft into July, and will share feedback with TMT at the June 9 TMT meeting.

Dworshak Operations

Steve Barton, COE, shared that given the forecast for an increase in precipitation, a ‘runoff event’ is likely to occur with potential impacts to Dworshak. Steve Hall, Walla Walla District COE, provided additional details about the June final forecast: the April-August forecast is up from May, at 1,630 KAF (61% of normal) and the June-July

forecast is up to 1,632 KAF (68% of normal). He also shared that there is now a 74% chance that the project will refill – an improved outlook from previous forecasts. The COE will continue to track and meet snow criteria, try to refill the project and hold minimum flows.

Flow Objectives/Transition to Refill and Grand Coulee

Paul Wagner, NOAA, shared that FPAC discussed a flow objective and recommended that the action agencies hold McNary flows as high as possible while operating to meet Grand Coulee refill. They asked the Action Agencies to shape flows to provide more flow now/less later, while maintaining the Grand Coulee refill target. John Roache, Reclamation, acknowledged this interest and said the agency would do its best to meet these criteria. BPA agreed with Reclamation's response to the salmon managers' request; they added that the anticipated increase in flows out of the Snake River over the next few weeks will provide an opportunity to raise the Grand Coulee pool while also operating with the intent to provide good flows for fish. Russ Kiefer, ID, noted that sockeye and wild Chinook smolts, both important listed fish, would be supported with this operation.

Action/Next Steps: The Action Agencies will operate to refill Grand Coulee while also trying to maintain higher flows in the near term to take advantage of the forecasted rain events. For next week, the Action Agencies expect flows will be well over 200 kcfs, with the caveat that this will hinge on actual precipitation and other variables.

Treaty Fishing Count Totals

Tom Lorz, CRITFC, reported on preliminary fishing count totals: 8,600 from ceremonial permit fishing, 4,970 from platform fishing, and 19,108 and 18,800 from gill nets. Final numbers and the breakdown by fish type will be shared in two weeks, at the June 16 face to face TMT meeting.

Operations Review

Reservoirs: Grand Coulee was at elevation 1269.1' and operating to refill as well as meet flow targets at McNary. Hungry Horse was at 3541.87', with 4 kcfs outflows and 11 kcfs inflows. Libby was at 2419.66' with inflows of 21.7 kcfs and outflows of 17 kcfs. Albeni Falls was at 2060.13' with inflows of 41.8 kcfs, and outflows of 32.9 kcfs. Dworshak elevation was 1581.6' with inflows at 11.9 kcfs and outflows at 1.2 kcfs. Lower Granite outflows were 78.8 kcfs. The Priest Rapids daily discharge was 132.6 kcfs, with a weekly average of 125.7 kcfs. McNary daily average outflows were 202.8 kcfs.

Note: The flow summary charts were revised per a request from TMT – they now show seasonal discharge objectives and weekly observed actual discharges.

Fish: TMT looked at data posted to the Fish Passage Center site. Paul Wagner, NOAA, reported on juveniles: spring Chinook and steelhead smolts are trending downward; yearling spring Chinook numbers were in the several 1,000s at Lower Granite; 40,000 at McNary and 20,000 at Bonneville. Steelhead subyearling counts were 15,000 at Lower Granite. Sockeye counts at Lower Granite were 400-500 and about 4,000 at Bonneville. A question was asked about whether sockeye releases out of Canada had been coordinated, and whether the high passage numbers near Rock Island were hatchery releases.

Action: Sheri Sears, Colville Tribe, offered to check in to this and report back to TMT.

(Note: Sheri sent the following response to TMT following the meeting: “they are the result of a huge escapement 2 years ago. ONA told me they estimated 8 million smolts in Osoyoos Lake for this year whereas in past years they have estimated either 1 million. ONA was surprised that Osoyoos could rear that many sockeye and still have them reach full size and didn’t anticipate the size of run they had this year.”)

Paul reported that there was a surprising increase in adult passage numbers at Bonneville, with about 3,000 spring Chinook passing per day. Jack counts were not as high this year as last year. Following up from discussion during last week’s TMT meeting, he reported that adult counts at Lower Granite, Little Goose and Lower Monumental were similar, so the operation of the spillway weir at Little Goose no longer appears to be an impediment to adult passage.

Power: Nothing to report at this time.

Water Quality: Scott English, COE, reported that all gauges are operational and that any TDG exceedances over the last week have been minor.

The next TMT meeting will be: a conference call on 6/9 at 9:00 am.

Agenda items will include:

- Water Supply Forecasts
- Libby Operations Update
- Operations Review

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 2, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of NOAA, Washington, Montana, Oregon, COE, USFWS, BOR, BPA, 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 provide them to the TMT chair or bring them to the next meeting.

2. Review Meeting Minutes for May 26

Review of the May 26 official minutes and facilitator's notes was postponed until TMT meets next in person on June 16.

3. Libby Spring Operations

At the May 26 meeting, the COE informed TMT that a proposed Libby-Arrow swap with Canada could maintain flow neutrality of the phase 2 Libby operation while allowing a more gradual release of the stored 260 kaf. Today Barton told TMT that option is now off the table because BC Hydro wants the stored water to remain in Libby until after Labor Day, which would contradict the objectives for releasing the phase 2 water – flow neutrality and a moderate discharge hydrograph.

Earlier in May, TMT agreed conditionally on flow neutrality of the Libby phase 2 operation by June 30 with the condition that TMT will revisit flow neutrality in June to see if it still makes sense. To help TMT address this question, Joel Fenolio and Jeremy Giovando (COE Seattle) presented two graphs depicting storage accounting scenarios at Libby, attached to today's agenda. Both graphs are based on one of the ESP trace inflow projections.

Attachment 3a, June 30 Accounting, depicts the current Libby operation, assuming the stored 260 kaf will be released by June 30, absent an agreement to extend the release into July or devise a mechanism to maintain flow neutrality. Attachment 3b, July 15 Accounting, shows a more gradual descending limb, which is how the Libby hydrograph might look if release of the 260 kaf were extended into July.

The sturgeon pulse is expected to begin around June 5, triggered by water temperatures and spawning behavior, Fenolio said. Under the deviation scenario shown in attachment 3a, Libby will maintain spill of more than 5 kcfs during the peak of the sturgeon pulse. The 260 kaf would be released in discharges of 20

kcfs for 4-5 days after the peak, then 16 kcfs for approximately 10 days, finally ramping down to 7 kcfs bull trout minimum flows.

As depicted in Attachment 3b, if the June 30 deadline is extended into July, Libby would release 20 kcfs for 2 days after the peak of instead of the 4-5 days shown in the first graph. Outflows would ramp down to 16 kcfs from June 19-28, then to 9 kcfs from July 1-10, and finally down to 7 kcfs. This scenario was assembled in response to Montana's request to reshape the descending limb of the Libby hydrograph. The operation appears to address Montana's concerns, Jim Litchfield (Montana) said. Adverse biological effects of abrupt ramp downs on fish and wildlife below Libby Dam occur at flows of less than 10-12 kcfs, while at higher flows the adverse impacts are increasingly diminished. Litchfield asked how runoff volumes might affect the July 15 scenario. Runoff and inflow at Libby would affect only spill amounts and reservoir elevation, not the operation itself, Fenolio replied.

At this point, TMT focused on whether the June 30 deadline for flow neutrality makes sense to all parties. The difference between the two scenarios in terms of volume shaped into July 1-15 is about 40 kaf. At the suggestion of Paul Wagner (NOAA), TMT considered various ways to shape the Libby operation that might achieve both objectives – flow neutrality by June 30 with a gradual ramp down after the sturgeon pulse ends.

Litchfield asked about the biological effect on fall Chinook of shifting the 40 kaf into the first half of July. The shift amounts to 20 ksfd flows at McNary, Tony Norris (BPA) said. Fall Chinook migration at McNary typically peaks during the first week of July, Wagner noted. All hatchery releases for Snake River populations will probably arrive in the McNary and John Day pools during the first week of July, so keeping flows up from late June through mid July is important.

Dave Wills (USFWS) suggested the possibility of making up the 40 kaf needed for flow neutrality with water from Grand Coulee, an idea seconded by the BOR, COE and Oregon. The estimate of 40 kaf is equivalent to $\frac{1}{2}$ to $\frac{3}{4}$ of a foot of elevation in Grand Coulee forebay, Roache said. There was general consensus that using water from Grand Coulee to meet both of the Libby objectives is a viable option.

In terms of the sturgeon pulse, it's important to avoid a steep descending limb because that is when sturgeon spawn, Jason Flory (USFWS) said. Spawning begins after flows peak and continues through the end of the pulse. This year, it won't be possible to provide a smoother descent than shown in attachment 3a due to lack of water. The descending limb adheres to ramp rates in the BiOp, Scott Bettin (BPA) said.

No final decisions were made today regarding the Libby operation. The COE will provide updated graphs by the morning of June 7 for FPAC and TMT to use in devising a compromise operation. There was general consensus to seek a compromise somewhere between an updated version of attachment 3b that

extends 40 kaf into July, and the ideal sturgeon operation. TMT will be notified via email when the sturgeon pulse begins, probably on June 11.

TMT members informally defined their positions on Libby operations:

Montana – Favors a more gradual ramp down by shifting flows into July as depicted in attachment 3b. The impact of a steep decline in flows is more immediate on the environment below Libby Dam than on the lower river. Montana seeks a reasonable balance between the needs of listed Snake River fall Chinook and the needs of listed fish in the lower river. Will consult with the Kootenai Tribe of Idaho (not represented today) on the Libby operation.

Oregon – Would object to a shift of approximately 40 kaf into July as shown in attachment 3b unless Grand Coulee flows are used to keep the Libby operation flow neutral. Shifting flows of more than 40 kaf into July would be acceptable as long as the operation remains flow neutral. Kruger won't be able to attend next week's TMT meeting and will try to schedule an alternate. For the record, Oregon would object to any Libby operation that isn't flow neutral.

BOR – Using Grand Coulee flows to achieve flow neutrality is a good idea that should be investigated. At this time foresees no negative impact in missing the Grand Coulee refill objective by 2-3 feet (80 kaf at Libby =1 foot elevation at Grand Coulee). Since this operation would have no effect on the summer draft elevation of Grand Coulee, there would be no effect on Grand Coulee elevations during the fall.

BPA – Will work with the COE on defining how the Libby operation might affect the reservoir this summer and next year.

COE – Focused on meeting multiple obligations, including the needs of migrating salmon and resident fish, while maintaining as high a forebay elevation as possible. Has no interest in holding Libby flows above 7 kcfs once the 260 kaf is out of the reservoir.

NOAA – At this point the operation shown in attachment 3a doesn't appear to be problematic. There may still be options, such as providing higher flows at the end of June, that would achieve the June 30 objective and provide a gradual ramp down per Montana's request.

USFWS – Supports release of the 260 kaf by the end of June because it would enhance the sturgeon spawning operation.

4. Dworshak Operations

Several days of precipitation across the basin will melt the high-elevation snow and create a runoff event at Dworshak over the next several days, Barton said. The COE's June inflow forecast for Dworshak was released on June 1, Steve Hall (COE) said. The April-July forecast is 1,630 kaf, 61% of normal, up

3% from the May forecast. The June-July forecast is 632 kaf, 68% of normal. Based on this forecast, the project has about a 74% chance of refilling. Approximately 109 kaf of flexibility remains as the project goes into refill.

According to snow covered area criteria, which are used as a flood control requirement for Dworshak, the current estimate of 32-33% snow covered area means about 175 kaf of required space in the reservoir. As of yesterday, the reservoir has a little over 350 kaf of space, twice the requirement, so Hall didn't foresee a problem. The COE will track this flood control requirement on a daily basis. The COE's intent is to maintain discharges at current levels so long as they don't violate flood control requirements.

TMT will cover Dworshak operations next week as part of a generic agenda item on managing refill of projects throughout the system.

5. Flow Objectives/Transitioning to Refill at Grand Coulee

With no updated STP traces or modeling results available at yesterday's meeting, FPAC wasn't able to identify a specific flow objective for McNary, Wagner reported. The general idea is to refill Grand Coulee while keeping flows as high as possible in the near term to aid remaining spring migrants in the lower river, especially below McNary Dam.

That objective coincides exactly with BPA's and BOR's plans, Norris and John Roache (BOR) agreed. McNary flows are expected to exceed 200 kcfs during this precipitation event. The Action Agencies will attempt to maximize Grand Coulee refill while maintaining a weekly flow average of 220 kcfs at McNary Dam, subject to unregulated flows from the Snake River.

In terms of historic smolt timing, sockeye and wild Chinook in particular will benefit from the precipitation, Russ Kiefer (Idaho) said. He asked the Action Agencies to weigh the needs of these fish against the importance of refill. Tom Lorz (CRITFC) suggested the COE look at ways to shape releases from Dworshak at the end of June right after the freshet, ramping down gently. The COE will keep Lorz' suggestion in mind as it manages refill. There's still a chance that Dworshak won't refill this year, Hall said.

TMT will monitor flow objectives throughout the rest of passage season as part of its regular operations review.

6. Treaty Fishing Count Totals

Tom Lorz gave preliminary totals from the spring treaty fishery. Fishers with ceremonial permits caught 8,600 spring Chinook, and platform fishers caught 4,970 fish. Gillnet fishers caught 19,108 fish.

7. Operations Review

a. Reservoirs. Grand Coulee is at 1,269 feet elevation, managing for refill and the McNary flow objectives as previously discussed.. Hungry Horse is at elevation 3,541.87 feet with discharges of 4 kcfs. Inflows are around 11 kcfs, expected to rise to 16 kcfs by the end of this week. Libby is at elevation 2,419.66 feet with inflows of 21.7 kcfs and outflows of 17 kcfs.

Albeni Falls is at elevation 2,060.13 feet with inflows of 41.8 kcfs and outflows of 32.9 kcfs. Dworshak is at elevation 1,581.6 feet with inflows of 11.9 kcfs and outflows of 1.2 kcfs.

In response to feedback from TMT, the COE revised the graphs for Lower Granite, Priest Rapids and McNary dams. Lower Granite is discharging 78.8 kcfs, forecasted to rise above 133 kcfs in the next few days. Priest Rapids discharged 132.6 kcfs yesterday. With a weekly average of 125.7 kcfs, the operation is meeting its flow objective of 130 kcfs plus or minus 5 kcfs. McNary outflows were 202.8 kcfs yesterday.

b. Fish. Juveniles: Spring Chinook and steelhead smolt migrations are on a downward trend, Wagner said, unless the missing fish from the Snake River appear. Several thousand fish per day are passing Lower Granite, around 4,000 per day at Little Goose, and around 2,000 per day at Lower Monumental. Most smolt migration at this point is occurring in the lower river, with 40,000 fish per day passing McNary and 20,000 per day at Bonneville.

Passage of steelhead subyearlings has risen from a few thousand per day to 10,000-15,000 fish per day at Lower Granite. About 4,000 steelhead per day are passing McNary and John Day, and 10,000-30,000 per day at Bonneville.

Sockeye passage at Lower Granite is several hundred fish per day, with similar numbers at Little Goose Dam. McNary and John Day are both passing large numbers, 380,000 sockeye per day at McNary and 150,000 per day at John Day, mostly mid Columbia fish. Bonneville is passing 95,000 sockeye per day. Tony Norris asked if the peak in sockeye passage at Rock Island Dam was due to hatchery releases. Sheri Sears (Colville Tribe) said they were most likely hatchery releases as part of the Canadian sockeye recovery effort. *(Note: In a June 2 email to TMT after today's meeting, Sears clarified that the high sockeye counts were not due to Canadian hatchery releases but were the result of a large escapement 2 years ago.)*

Adults: Spring chinook passage rates have risen from just over 1,000 fish per day to more than 3,000 fish per day at Bonneville. Unlike last year, jack counts this year are not unusually high. The Little Goose weir issue seems not to be a problem for adults at present, so the combination of a higher crest operation and a spill pattern for low flows appears to be working.

Power. There was nothing to report today.

Water Quality. All fixed monitoring stations are working, and a few recent TDG occurrences were quickly corrected, Scott English (COE) reported.

9. Next Meeting

The next TMT meeting will be a conference call on June 9, followed by a meeting June 16 in Portland, location TBA. The June 9 call will cover Libby operations and updated water supply forecasts.

Name	Affiliation
Paul Wagner	NOAA
Charles Morrill	Washington
Jim Litchfield	Montana
Doug Baus	COE
Rick Kruger	Oregon
David Wills	USFWS
John Roache	BOR
Tony Norris	BPA
Scott Bettin	BPA
Laura Hamilton	COE
<u>Phone:</u>	
Russ Kiefer	Idaho
Steve Barton	COE
Tom Lorz	CRITFC
Joel Fenolio	COE Seattle
Jeremy Giovando	COE Seattle
Steve Hall	COE Walla Walla
Jason Flory	USFWS
Margaret Filardo	FPC
Barry Espenson	CBB
Tim Heizenrader	Centaurus
Holli Krebs	JP Morgan
Scott English	COE
Ruth Burris	PGE
Russ George	WMC
Rob Allerman	Deutsch Bank
Richelle Beck	DRA
Rob Dies	Iberdrola Renewables
Tom Le	Puget Sound Energy
XX	Seattle City Light
Sheri Sears	Colville Tribe

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Wednesday June 9, 2010 09:00 - 12:00

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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

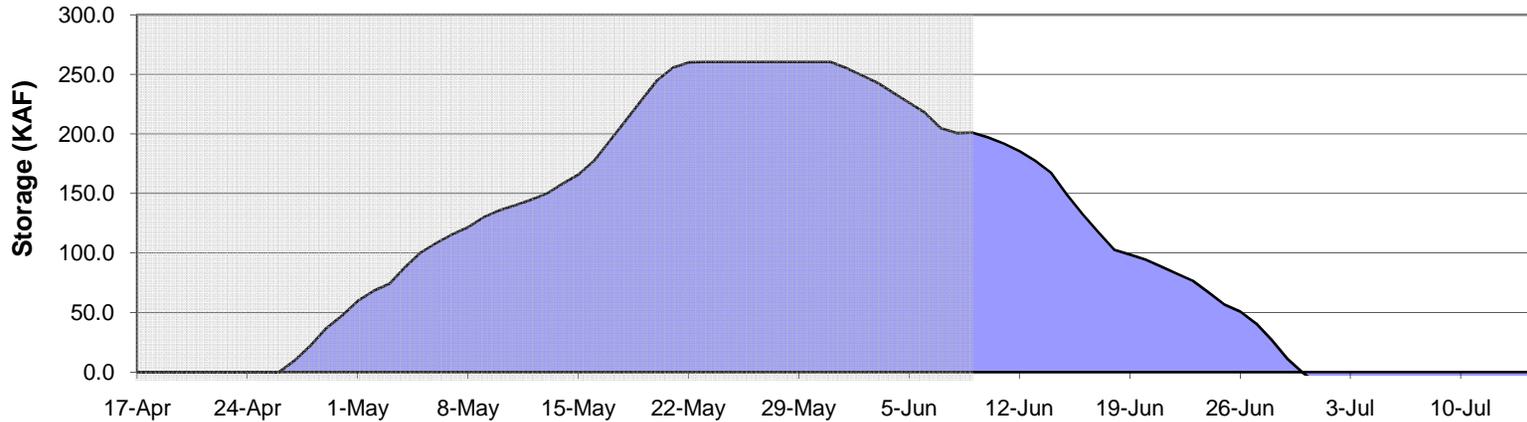
*All members are encouraged to call Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

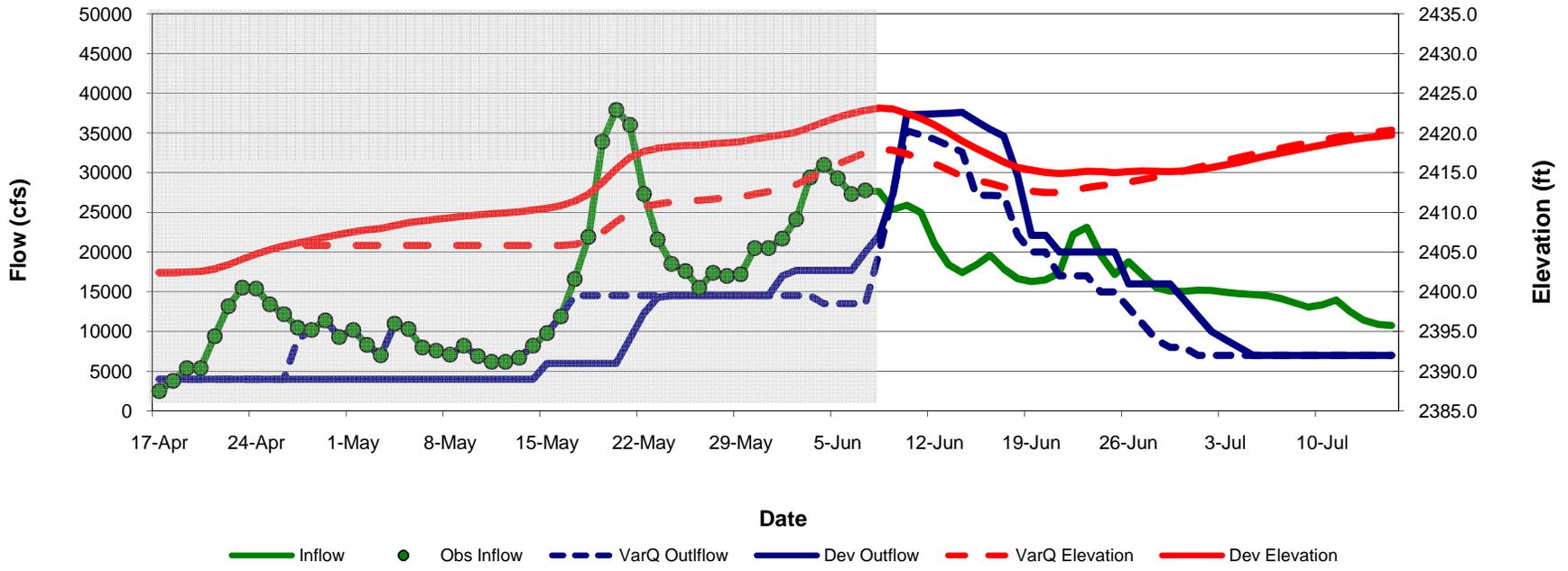
1. Welcome and Introductions
2. Updated Water Supply Forecast - *Steve Barton, COE-RCC*
3. Libby Operations - *Steve Barton, COE-RCC*
 - a. [Deviation Request Accounting](#)
4. Summer FOP Update - *Dan Feil, COE-PDD*
 - a. [2010 Summer Fish Operations Plan](#)
5. Other
 - a. Set agenda and date for next meeting - **June 16, 2010**
 - b. [\[Calendar 2010\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

Libby Dam Deviation Request Accounting 260 KAF Released by June 30th



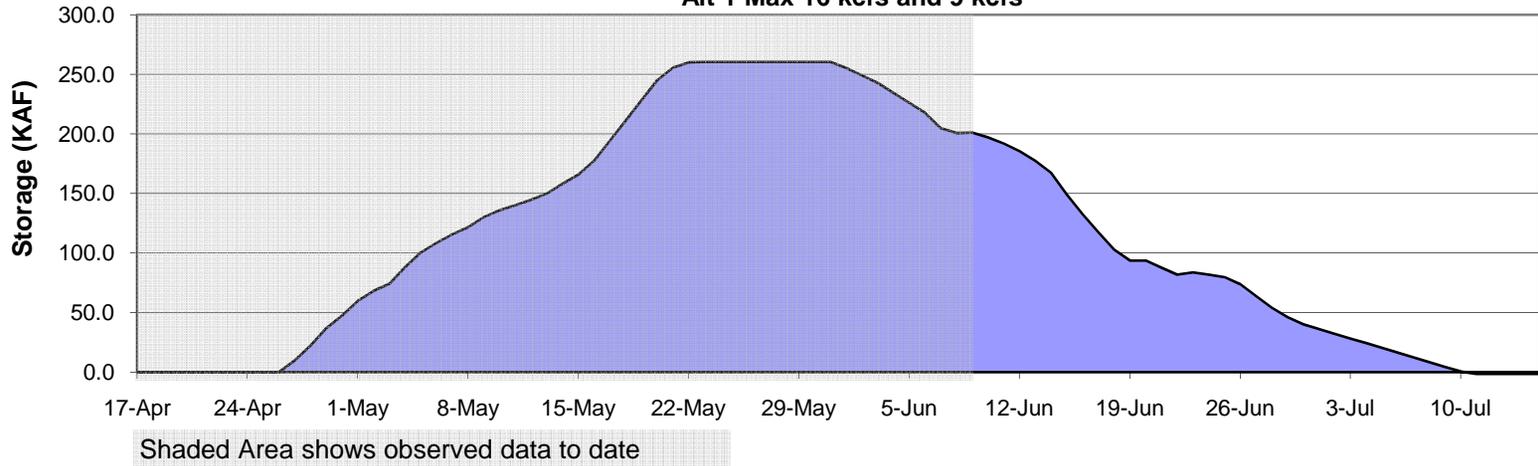
Shaded Area shows observed data to date



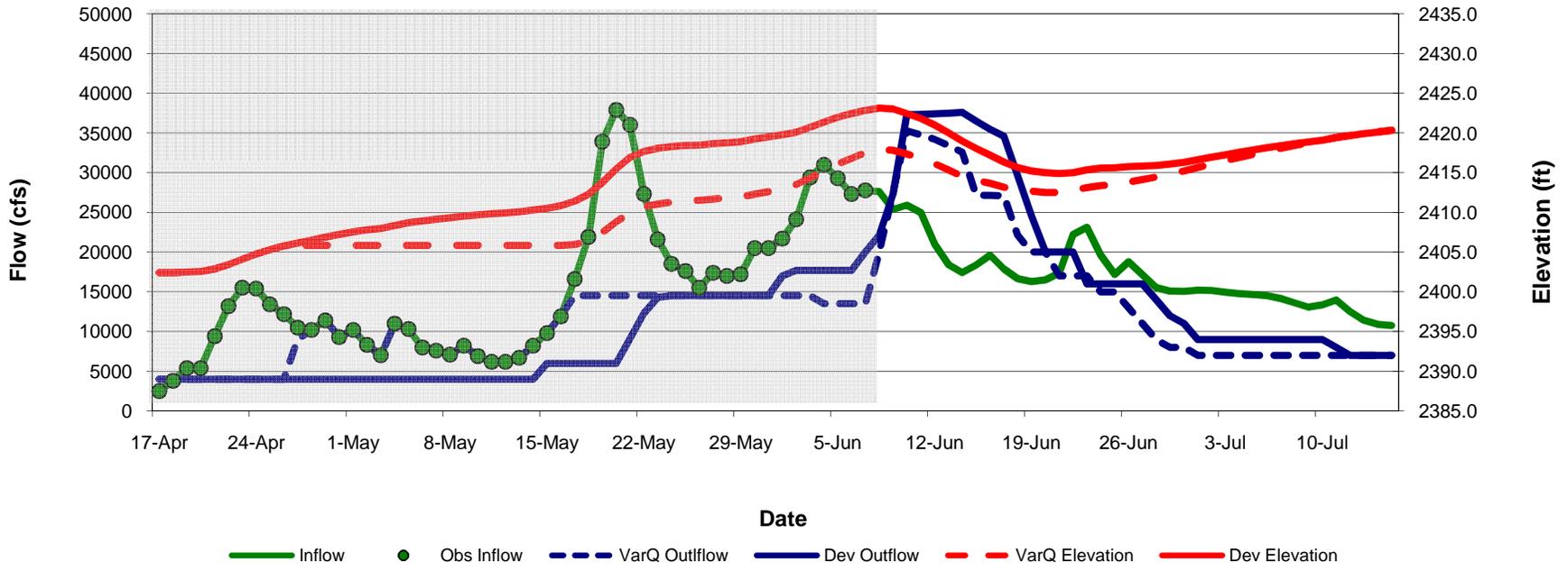
Date

—●— Inflow
 ● Obs Inflow
 - - - VarQ Outflow
 — Dev Outflow
 - - - VarQ Elevation
 — Dev Elevation

Libby Dam Deviation Request Accounting
260 KAF Released by July 15th
Alt 1 Max 16 kcfs and 9 kcfs



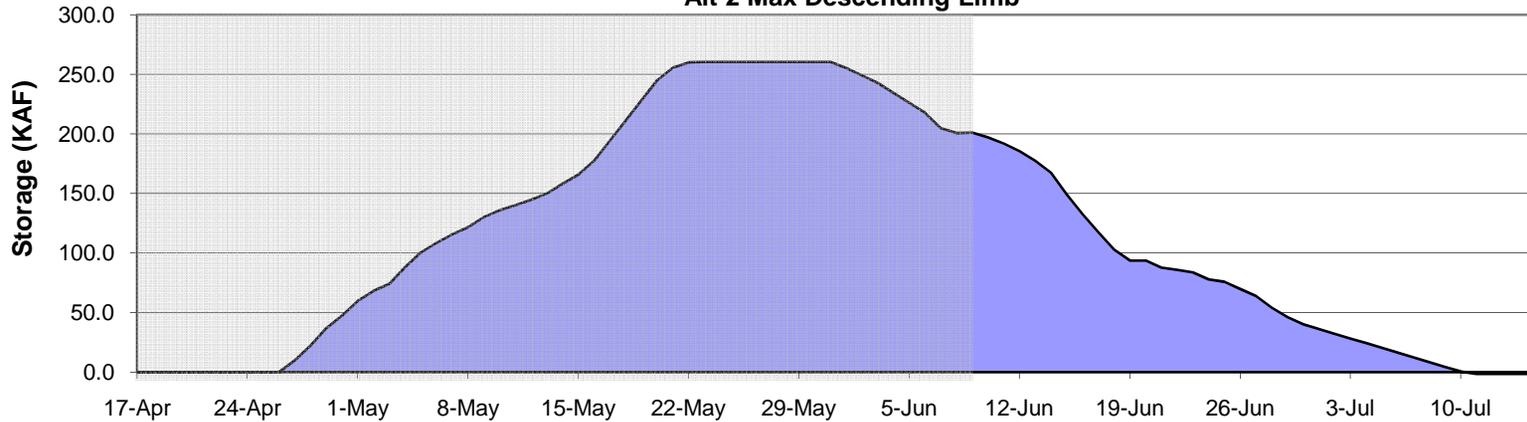
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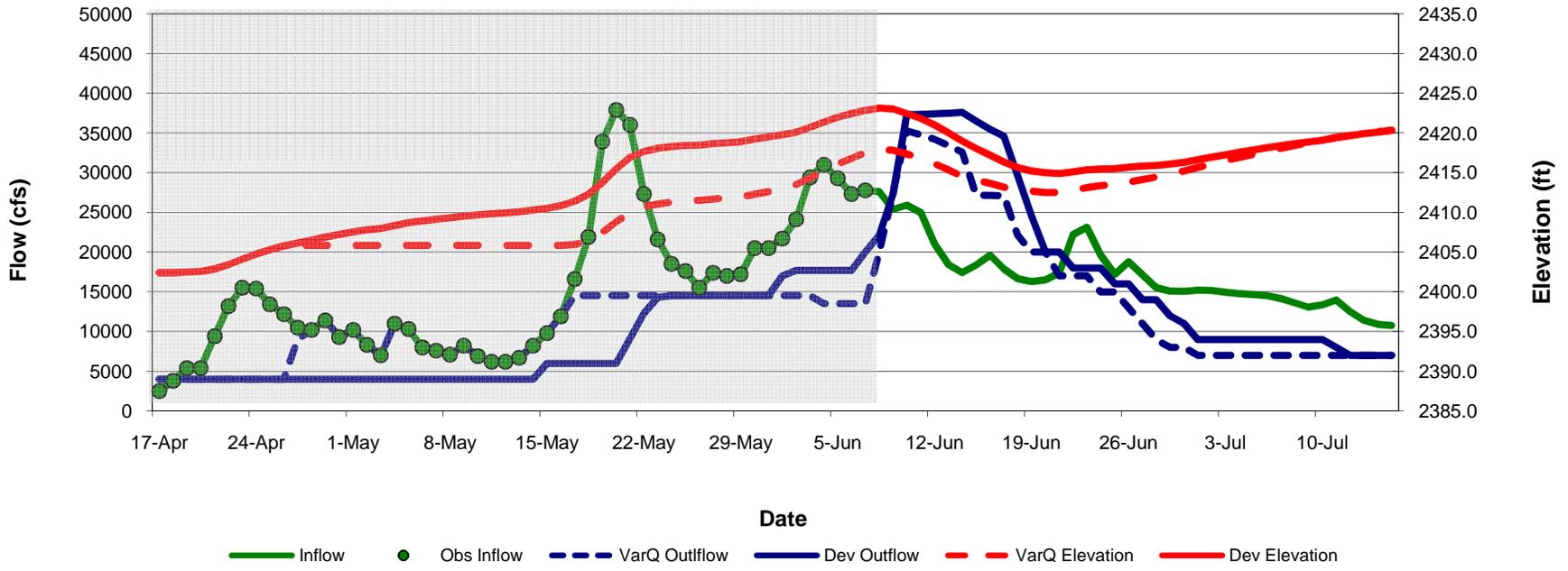
Date

—●— Inflow
 ● Obs Inflow
 - - - VarQ Outflow
 — Dev Outflow
 - - - VarQ Elevation
 — Dev Elevation

**Libby Dam Deviation Request Accounting
260 KAF Released by July 15th
Alt 2 Max Descending Limb**



Shaded Area shows observed data to date



2010 Summer Fish Operations Plan

INTRODUCTION

The 2010 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 2010 summer fish migration season; generally June through August. While the Action Agencies are committed to the 2008 NOAA Fisheries FCRPS Biological Opinion (2008 BiOp) summer spill measures and achieving hydro performance standards at the mainstem FCPRS projects, which are supported by the 2008 BiOp analysis, the Action Agencies support adoption of the project operations contained in the Order for 2009 Summer Spill Operations for 2010 to avoid delaying the expeditious resolution of the case challenging the 2008 BiOp and Supplemental BiOp. The 2010 Summer FOP adopts project operations contained in the Order for 2009 Summer Spill Operations with the exception of operational adjustments to conduct essential research at Bonneville Dam.

The 2010 Summer FOP also provides for adaptive management and is consistent with the 2008 BiOp, the 2010 Supplemental BiOp, and the Corps' Record of Consultation and Statement of Decision Documents (2008 and 2010 Supplemental ROCASOD) adopting the project operations contained in the 2008 BiOp and 2010 Supplemental BiOp. As in the 2009 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 2008 and 2010 Supplemental BiOp and other guiding operative documents including the 2010 Water Management Plan (WMP), seasonal WMP updates, and the 2010 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 related to operational emergencies, coordination with regional entities, and monthly reporting.

GENERAL CONSIDERATIONS FOR FISH OPERATIONS

For planning purposes, the Corps' 2010 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.¹ 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 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

¹ 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% in 2010, consistent with 2009 court ordered operations.

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 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). 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 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 Little Goose Dam when river discharge is less than approximately 40 kcfs; or up to $\pm 1.6\%$ at The Dalles Dam). 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 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 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 as a daily average, 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 2009, 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 2010, 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 allow finer control of spill discharge during periods of low river discharge. If necessary in 2010, 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.

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 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

The following describes the juvenile fish transportation program under all runoff conditions and is consistent with the 2009 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.

Lower Snake River Dams - Operation and Timing

The 2010 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 2009 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 2008 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 continue 2009 Court ordered spill through August 31 at all four lower Snake River projects. Summer spill levels are shown in Table 2.

Lower Columbia River Projects

Summer spill will begin July 1 at John Day and The Dalles dams, June 20 at McNary Dam, and June 16 at Bonneville Dam. 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 2010 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 2008 and 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 2010. 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 2010 summer spill levels at lower Snake and Columbia River projects.²

Project	Planned 2010 Summer Spill Operations (Day/Night)	Comments
Lower Granite	18 kcfs/18 kcfs	Same as 2009
Little Goose	30%/30%	Same as 2009
Lower Monumental	17 kcfs/17 kcfs	Same as 2009
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 2009
McNary	50%/50%	Same as 2009 (except without spillway weirs)
John Day	July 1-July 20: 30%/30% vs. 40%/40% July 20-August 31: 30%/30%	Same as 2009
The Dalles	40%/40%	Same as 2009
Bonneville	June 16-July 20: 85 kcfs/121 kcfs vs. 95 kcfs/95 kcfs July 21-August 31: 75 kcfs/Gas Cap	Research operation from June 16-July 20; same as 2009 from July 21-August 31

Lower Granite

Summer Spill Operations June 21 – August 31, 2010: 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 2010. Established spill patterns as described in FPP Section 9 will be used in 2010.

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

² Table 2 displays in summary form the planned summer spill operations. More specific detail governing project operations is included in project specific sections.

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. Maintenance dates are subject to change.

Little Goose

Summer Spill Operations June 21 – August 31, 2010: 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 2010. Established spill patterns as described in FPP Section 8 will be used in 2010.

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. Maintenance dates are subject to change.
- Turbine Unit 1 Operation: In 2010, 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 31, 2010: Spill 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 2010. Spill patterns as described in FPP Section 7 will be used in 2010.

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

Ice Harbor

Summer Spill Operations June 21 – August 31, 2010: 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.

Changes in Operations for Research Purposes:

- Summer research operations: There will be no special spill operations for research in 2010. Spill patterns as described in FPP Section 6 will be used in 2010.

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 will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. Dates are subject to change in coordination with FPOM or TMT.

McNary

Summer Spill Operations June 20 – August 31, 2010: 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 2010. There will be special turbine operations for research in 2010. The special research

operation will affect powerhouse units 4, 5, and 6 which will be operated outside 1% efficiency to examine if adverse fish condition or descaling effects occur as a result. The study has been coordinated through the Studies Review Work Group (SRWG) process. 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:

- 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.
- Spill will be curtailed as needed to allow safe operation of fish transportation barges near collection facilities downstream of the project.
- Unit outages will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. Dates are subject to change.

John Day

Summer Spill Operations July 1 – August 31, 2009: Spill operations will continue from spring at 30% vs. 40% spill 24 hours per day and continue through the test period until approximately July 20. During testing, spill levels will alternate in a random four-day block with two-day treatments (30% or 40% spill). Spill treatment changes will occur at 0600 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 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% vs. 40%) will continue through summer testing.
- Summer research operations: A repeat of the 2009 spillway weir test is presented here for planning purposes; however details such as spill pattern and test timing may change. These changes will be coordinated through the SRWG and TMT. Two spillway weirs that pass approximately 10 kcfs spill each are installed in spill bays 18 and 19.
- 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 under two spill treatments.
- Spill pattern(s) during biological test: Spill patterns for 30% and 40% spill have been developed at ERDC in coordination with regional agencies. These patterns are included in the FPP section 4.

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

Summer Spill Operations July 1 – August 31, 2009: 40% spill 24 hours per day.

Changes in Operations for Research Purposes:

- Spill pattern during the biological test: New spill patterns developed for use with the recently completed spillwall and included in FPP section 3 will be used.

Operational Considerations:

- If total river discharge is between 90 and 150 kcfs, spill percentage could range from 38.6 to 41.4 percent.
- If total river discharge is between 150 and 300 kcfs, the spill percentage could range from 38.9 to 41.2 percent.
- If total river discharge is between 300 and 420 kcfs, the spill percentage could range from 38.4 to 41.0 percent.
- 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 will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. 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, 2009: Summer research operation consisting of a two treatment spill test of 85 kcfs/121 kcfs vs. 95kcfs/95 kcfs. The research operation will begin at 0430 hours on June 16 and continue through July 20. This summer research operation begins earlier than the spring to summer transition dates identified in the 2010 Spring FOP, however the operation and transition date has been fully coordinated with and has the full support of regional sovereigns. During testing, spill levels will alternate in a random four-day block with two-day treatments. Spill treatment changes will occur according 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.

Changes in Operations for Research Purposes:

- Spill duration for testing: Approximately June 16 – July 20.
- Summer research operations: 85 kcfs/121 kcfs vs. 95kcfs/95 kcfs.
- 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 under two spill treatments.
- Spill pattern for summer operations: Spill patterns in FPP section 2 will be used.

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 will occur for required maintenance activities. The outage schedule for the project is shown in the FPP. Dates are subject to change.

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 2010 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

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/ftppub/water_quality/12hr/html/

COLUMBIA RIVER REGIONAL FORUM TECHNICAL MANAGEMENT TEAM

June 9, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

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.

Water Supply Forecast

Steve Barton, COE, summarized the weather and water supply changes since last week's TMT meeting, noting a significant increase in precipitation basin-wide. Barton said the COE was actively working to manage the runoff and ready the system for a pending storm forecasted to enter the basin in the next few days – though it was uncertain where it would ‘land.’ Steve reported that Grand Coulee and Dworshak were likely to be nearly full by early next week; that some of the tributaries, particularly in Idaho, were above flood stage, but that flows in general were receding and that the pending precipitation would likely create a “moderate response” – e.g. not expecting the rains or runoff to cause any new tributaries to go above flood stage.

Steve shared highlights from the official June final water supply forecast, which was posted on the TMT site on 6/9. Basin-wide precipitation was forecasted at 150% of normal for the first half of June and normal for the rest of June. The forecast for Grand Coulee January-July was 46.4 MAF (74% of normal) and April-September was 48.1 MAF (75% of normal). The Lower Granite forecast for January-July was 19.2 MAF (64% of normal) and for April-July was 14.6 MAF (68% of normal). At The Dalles, the forecast for January-July was 74.7 MAF (69% of normal) and 65.5 MAF for April-July (70% of normal).

In response to a question, Steve clarified that the official forecast and ESP forecast are formulated differently and therefore don't always match – he suggested that detailed technical questions about the forecasting methodologies should be directed to the River Forecast Center, who run the models.

Libby Operations

Steve Barton, COE, reported that the sturgeon operation had begun, and that Libby had operated at full powerhouse on 6/9; at 0700 hours on 6/10, the COE planned to shift to 5 kcfs spill and would increase to 10 kcfs while managing to acceptable TDG levels.

Barton also recapped the set of operating scenarios for drafting water out of Libby that were presented at the 6/2 TMT meeting. He said the COE had responded to the feedback they heard from TMT members at last week's meeting, to look at a more stable recession and extending it into July while still maintaining a flow neutral operation for the lower Columbia River (all water is released from Grand Coulee by June 30). Two new shape

scenarios were presented today which depicted these objectives and assumed a ½ foot draft from Grand Coulee (roughly 40 KAF needed to extend the draft out of Libby into July.) The tradeoff would be that Grand Coulee would fill ½ a foot lower than “full” in order to achieve the flow neutral condition.

Joel Fenolio and Jeremy Giovando, Seattle District COE, shared more details about the graphs and suggested that given the increase in precipitation into the system, the first scenario that would shape the water out by June 30 would require an even more dramatic drop in flows to meet bull trout minimums than was shown in previous models. Alternative 1 (the second graph) shaped the descending limb by dropping flows from 20 kcfs to 16 kcfs by June 30, while Alternative 2 (the third graph) shaped the descending limb by dropping flows from 20 kcfs to 18 kcfs to 16 kcfs to July 15. Both operations carry the condition of being flow neutral in the lower Columbia River as described above. Jason Flory, USFWS, noted that the latter was the USFWS’ preferred option to best support sturgeon. Barton clarified that Grand Coulee typically refills July 4th weekend, and said that if another “slug” of water arrives, that will be water for July. He added that while there is no specific date set for filling Grand Coulee, the Action Agencies are coordinating on a date in the range of July 4-6th.

The COE asked TMT members to respond to the following proposal: to release 40 KAF of the Phase II storage at Libby in the first half of July to provide a more gradual ramp-down in discharge. To maintain the flow neutral attributes to the middle and lower Columbia River, Grand Coulee will be no higher than 1289.5 ft on July 01 (0.5 ft at Grand Coulee is the elevation equivalent of 40 KAF). The COE clarified that Grand Coulee will be made whole once the Libby water is released in early July.

- Montana – Support the use of Grand Coulee and support Alternative 2 if this reflects the USFWS’ preference. Thanks to the COE and Reclamation for offering ideas and working to meet the interests of all parties in the region.
- Idaho – Support the operation and Alternative 2. Thanks to the COE for their efforts to meet all needs.
- Oregon – Ok with the proposed operation.
- Washington – No objection to the use of Grand Coulee, and support Alternative 1 or 2.
- USFWS – Support the operation and use of Grand Coulee. Prefer Alternative 2.
- CTUIR – No objection to the operation.
- NOAA – Support the operation as proposed, ok with Alternative 1 or 2.
- Reclamation – Supports the operation.
- BPA – Supports the operation.

Action/Next Steps: The COE will implement the operation as proposed, using Alternative 2 as the guide for shaping flows. TMT will check in on the progress of the sturgeon operation at the 6/16 TMT meeting and the COE will continue its accounting out of Libby and stay open to questions and comments about the operation along the way.

Dworshak Operations

Steve Barton, COE, shared that given the precipitation event, refill of Dworshak was likely and there was a possibility for additional volume from the project. Steve Hall, Walla Walla District COE, provided additional details. He reported that with diminishing available space (7 KAF of space available as of 6/9) before the COE meets its 'snow covered area flood control criteria', the COE planned to do a snow flight next week to verify the snow covered area monitoring data and determine when to fill and what flow levels to release into the system. Paul Wagner, on behalf of the Salmon Managers, said that they had discussed a recommendation to go to minimum discharge and fill as soon as possible, followed by passing inflow at the project. The COE responded that it will do its best to accommodate the Salmon Managers' guidance while meeting its flood control requirements.

Action/Next Steps: TMT will revisit the operation during next week's face to face meeting.

2010 Summer Fish Operations Plan

Dan Feil, COE, shared the draft FOP that was posted on the TMT web page earlier this morning. He gave an overview of the plan, suggesting that summer operations would be rolled over from 2009, except for in two key areas:

Bonneville: The spill test at Bonneville will begin on 6/16 (earlier than last year) and will spill 85 kcfs during the day/121 kcfs at night. The night time spill level reflected the seasonal average gas cap. Normal operations would resume on 7/21, with 75 kcfs day/gas cap at night.

- **Action:** Per a suggestion from Rick Kruger, OR, the FOP will explicitly state that the Camas/Washougal TDG monitoring gauge will not be used to constrain spill operations during the test period, but it will be used for management beginning on July 21.
- The FOP notes that Bonneville will spill at a minimum 50 kcfs (or not at all) based on previous Fish Passage Plans and Water Management Plans. FPOM and FFDRWG are reviewing this criterion and, if a change is recommended, the issue will be brought to TMT for discussion.

McNary: The spillway weirs will be removed for the summer spill period. The spill pattern will be the same as the pre-TSW pattern contained in Table MCN-10 in the FPP. Agreement on this change was reached via FPOM and FFDRWG.

Action/Next Steps: The COE will submit the FOP to the court as soon as it is final, and asked that any comments be sent to Dan Feil by COB on 6/9. The COE will notify TMT members when the final version of the document is posted to the web.

Operations Review

Reservoirs: Grand Coulee was at elevation 1283.8' and expected to be close to full by the weekend. Tony Norris, BPA, recommended that the project refill within the next week to allow time to set the project up for lighter loads and recreational needs over the July 4th holiday weekend. With this proposal, the reservoir would fill, then draft down some to support those needs. Similar to Libby, the operation would be volume-neutral. Montana responded with support for the operation, as did NOAA. Paul Wagner, chair of FPAC,

suggested this response was the general consensus of the salmon managers at FPAC and suggested the need to revisit to understand the specifics of the operation as the July 4th weekend gets closer. It was also noted that this proposed operation will likely support a smoother operation at McNary.

Lower Granite day average outflows peaked at 207.2 kcfs; McNary day average outflows were 359 kcfs. Steve Barton said the COE is doing its best to manage the added water in the system.

Water Quality: Tony Norris, BPA, noted that TDG levels in the system are close to 120% limits and encouraged the salmon managers to review the spill priority list and suggest any revisions as soon as possible. The salmon managers planned to review the list. Russ Kiefer, Idaho, shared general guidance and support for a smooth transition between uncontrolled and controlled spill to the best of the action agencies' ability, noting that in the past, concerns have been raised particularly at Lower Monumental around this issue. He reminded everyone that the objective for setting TDG levels is fish protection. Scott English, COE, reported that involuntary spill has occurred in the system and caused TDG levels to rise to 125-130%. He will provide a full TDG report at the 6/16 TMT meeting.

Russ Kiefer also expressed appreciation to Walla Walla District and project personnel at McNary for their flexibility and diligence in meeting operational recommendations throughout the spring as conditions changed. He added that important listed fish were supported by these operations.

The next TMT meeting will be: face to face on 6/16 at 9:00 am.

Agenda items will include:

- Notes/Meeting Minutes Review
- Dworshak Operations
- Libby Operations
- Grand Coulee Operations
- Hanford Reach Update
- Operations Review

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 9, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of BPA, COE, NOAA, Montana, Washington, USFWS, BOR, USFWS, Oregon, Idaho, the Umatilla Tribe 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. Updated Water Supply Forecast

Weather. Over the past 7 days the region has experienced significant precipitation basin-wide, Barton reported. The Cascade Range in Oregon, southern Washington and northern Idaho, as well as areas of British Columbia received significant precipitation. The highest rainfall was in the Willamette valley which received 3-10 inches above normal. Central Idaho has received 2-8 inches above normal. Across the basin, the historic average precipitation for June was exceeded in the first 4 days of the month. The Action Agencies have been managing significant precipitation and it's unknown where this weather system will land. Grand Coulee and Dworshak reservoirs are expected to be nearly full by next week. Some tributaries are above the flood stage, mainly in Idaho. Flows in general are receding, however, and no rivers are expected to rise above flood stage that aren't already there.

Water Supply. The final RFC water supply forecast as of June 7 was posted to the TMT web page yesterday, Barton said. The latest RFC forecast assumes that precipitation will be 150% of normal for the first half of June and normal for the rest of the period. Inflow forecasts for specific projects are:

- Grand Coulee – January-July: 46.4 maf, 74% of normal; April-September: 48.1 maf, 75% of normal
- Lower Granite – January-July: 19.2 maf, 64% of normal; April-July: 14.6 maf, 68% of normal
- The Dalles – January-July: 74.0 maf, 59% of normal; April-August: 65.5 maf, 70% of normal

John Hart (EWEB) asked how the final forecast is assembled and how the official and ESP forecasts differ. The primary difference is in model formulation, Barton replied. All parameters are updated for the final forecast, while

parameters for the early bird and mid-month forecasts might not be up to date. The RFC can provide further technical details on how its forecasts are prepared.

3. Libby Operations

Libby outflows have picked up to levels specified in the sturgeon operation, Barton said. Full powerhouse flows will occur today, with the project continuing to operate at full capacity and spilling 5 kcfs beginning at 7 am mountain time tomorrow, June 10. The aim is to increase spill to the full 10 kcfs specified in the sturgeon operation, while monitoring TDG saturation levels as spill increases.

Deviation Request Accounting. Link 3a to today's agenda contains three charts: the modeled shape of the June 30 flow-neutral scenario and two alternative scenarios that extend 40 kcfs outflows into July. Scenarios 2 and 3 were formulated in response to requests by Montana and USFWS for a more gradual ramp down than scenario 1 provides. Scenarios 2 and 3 differ in that scenario 3 has a more gradual transition from 20 to 15 kcfs outflows in late June, which would benefit sturgeon spawning.

In order to maintain the flow-neutral attributes of the Libby operation to satisfy downstream parties, the COE proposed today to supply the 40 kaf for scenarios 2 or 3 by refilling Grand Coulee to approximately half a foot lower than its usual refill target of 1,290 feet. Thus an elevation of 1,289.5 feet in Grand Coulee reservoir would be considered full. A decision to aim for half a foot less by end June wouldn't preclude refilling Grand Coulee later in the summer, Jim Litchfield (Montana) noted.

Joel Fenolio (COE Seattle) described each of the three scenarios. Scenario 1 shows 260 kaf of water stored under the deviation request, to be released by June 30. This basically means releasing flows of 23 kcfs during the first part of the sturgeon operation and ramping down to 7 kcfs flows in July. Scenario 2 shifts 40 kaf into July by holding 15 kcfs outflows, then ramping down to 9 kcfs. Scenario 3 essentially does the same thing as scenario 2 with an intermediate step between 20 and 15 kcfs outflows. This extends the descending limb which would benefit the sturgeon spawning operation.

Barton asked TMT members for their views of the COE proposal to supply 40 kaf via a decision to miss Grand Coulee refill. TMT members gave their views of the options:

- **USFWS** – Strongly favors scenario 3 because it supports the incubation of sturgeon eggs. Comfortable with using half a foot of water from Grand Coulee to shape the Libby draw down.
- **Montana** – Either scenario 2 or 3 would satisfy Montana's objectives. Montana is highly appreciative of Action Agency efforts to find a workable alternative for all parties.

- **Idaho** – Supports scenario 3, including use of Grand Coulee water to keep the Libby operation flow-neutral. Idaho appreciates the COE’s work to meet everyone’s needs with this operation.
- **Oregon** – Either scenario 2 or 3 would be acceptable.
- **CRITFC/Umatilla** – Either scenario 2 or 3 would be acceptable.
- **Washington** – No objection to scenario 2 or 3.
- **NOAA** – Supports either scenario 2 or 3 as proposed.
- **BOR** – Supports the proposed operation.
- **BPA** – Supports the proposed operation.

With consensus on scenario 3, the COE will operate Libby Dam accordingly. TMT will track the sturgeon operation in upcoming meetings.

4. Dworshak Operations

Dworshak has started discharging additional water, thanks to recent precipitation, Barton said. The COE has increased discharges in order to moderate flows. The current objective in this difficult balancing act is to refill Dworshak reservoir.

Since the beginning of this week, the COE has been concerned about Dworshak flood control requirements, which are based on snow covered area, Steve Hall (COE) said. On June 7, the reservoir had 30 kaf of space according to flood control regulations; today it has 7 kaf of space. The snow covered area requirement is being tracked via a model that runs hourly, but the COE plans to verify the amount of snow covered area via satellite photography taken from a flight schedule for June 14 or 15.

The last time the Salmon Managers discussed the Dworshak operation, it was recognized that the COE needed to schedule 2-3 days of 7.5-8 kcfs outflows, Paul Wagner (NOAA) recalled. After that, the preference was to go to minimum discharges to fill the project and pass inflows. The COE is continuing to release 7.5 kcfs daily average flows from the project, Hall said. Additional modeling will indicate whether it’s possible to cut back to passing inflows this Friday, June 11. Flows might need to be held a little higher due to the snow covered area requirement, but not reduced to minimums.

The COE is aware of the Salmon Managers’ intention to refill Dworshak as soon as possible and will do what it can to accommodate the request, Barton said. TMT will revisit Dworshak operations at its next meeting June 16.

5. Summer Fish Operations Plan

The 2010 Summer Fish Operations Plan is posted on the TMT page and linked to today's agenda, Dan Feil (COE) said. The plan is to roll over last summer's operation at all federal projects, with the exception of Bonneville Dam.

A two-treatment test planned for Bonneville had been postponed this year due to lack of water, but recent precipitation makes the test possible. The plan is to start the spill test on June 16, four days earlier than last summer. The test will consist of two treatments: First is 85 kcfs spill during daytime and 121 kcfs spill at night (i.e. the seasonal average of nighttime gas cap spill over the past few years). That treatment will be compared to spill of 95 kcfs for 24 hours a day. The two treatments will be randomly alternated, with treatments lasting 2 days each. The test will begin next week and run through July 20. From July 21 to the end of August, Bonneville will repeat last year's operation of 75 kcfs daytime spill and to the gas cap at night.

Rick Kruger (Oregon) said a statement needs to be added clarifying that the 120% TDG limit at night won't be constrained by readings from Camas-Washougal gage, as agreed to earlier. The COE will add this specification, Feil agreed. While Camas-Washougal gage won't be used for spill management at night during the research study, it will be used for spill management from July 21-August 31, Laura Hamilton (COE) noted.

One other operation differs slightly from last year's – McNary Dam will operate without its spill weirs this summer, as recommended via FPOM and FFDRWG consensus. The minimum spill level at Bonneville is 50 kcfs. If FPOM and FFDRWG come up with an alternative recommendation based on hydrological modeling data and biological findings, that recommendation would be referred to TMT for further discussion, Feil said. For the time being, spill will be shut off at Bonneville if it's not possible to spill 50 kcfs.

Feil asked for feedback by close of business today on the 2010 summer FOP, which will be submitted to the court soon. The COE will notify TMT via email when the final version is posted to the TMT web page.

6. Operations Review – Highlights

Reservoirs. Grand Coulee – With a current elevation of 1,283.8 feet, Grand Coulee Dam spilled in the past week in response to heavy rains and will probably be close to full by this weekend, John Roache (BOR) said. With high flows at present, BPA would like to refill the reservoir early, meaning sometime between now and June 28 and possibly within the next 5-8 days, Tony Norris (BPA) said. To accommodate recreation and create space, the proposal is to refill Grand Coulee before the 4th of July weekend, then draft the reservoir. The Action Agencies would not expect to refill Grand Coulee again under this proposal. Instead, refill would be defined as elevation 1,289.5 feet elevation, per

the Libby adjustment discussed earlier. This would probably produce a smoother operation at McNary than if the Action Agencies hold off on spill after the 4th of July. Norris asked the Salmon Managers for their views of this proposal (Oregon, Washington and USFWS didn't vote):

- **Montana** – No objections.
- **NOAA** – While no problems have been identified, the operation over the 4th of July weekend is still unclear – to be refined as the time approaches.
- **Idaho** – Wants a smooth transition from uncontrolled to controlled spill. Doesn't want the spill program cut unnecessarily as a result of gas produced by uncontrolled spill. Lower Monumental Dam is of special concern in this regard. Idaho appreciates the efforts of Walla Walla COE and project staff regarding spring operations this year at McNary. The COE will do its best to ensure a smooth transition out of uncontrolled spill.

Lower Granite –The peak release was 207.2 kcfs on June 6. Current releases are 181 kcfs per day, and flows on the Snake are still high, producing TDG exceedances.

McNary – Yesterday releases were 341 kcfs; currently they're 359 kcfs. Flows are high, and the COE intends to run the river on the high side in order to maintain operational flexibility under current weather conditions, Barton said. Precipitation and spill levels will be uncertain for the rest of June.

Spill Priority List. With a lot of water in the system pushing against the 120% TDG standard below the dams, Norris advised TMT members that now is the time to look closely at the spill priority list and identify any needed changes.

Water Quality Monitoring. All fixed monitoring stations are working, Scott English (COE) reported. Involuntary spill throughout the system is yielding TDG readings of 125-130%. English will give a final report on TDG exceedances in May at the June 16 TMT meeting.

9. Next Meeting

The next TMT meeting will be in person on June 16 at the COE. Agenda topics include Dworshak and Libby operations, a final report on the Hanford Reach operation, and the usual operations review.

Name	Affiliation
Tony Norris	BPA
Steve Barton	COE
Paul Wagner	NOAA
Jim Litchfield	Montana
Cindy LeFleur	Washington
David Wills	USFWS

John Roache	BOR
Scott Bettin	BPA
Rick Kruger	Oregon
Tom Lorz	CRITFC for Umatilla Tribe
Jason Flory	USFWS
Greg Hoffman	COE Libby Dam
Joel Fenolio	COE Seattle
Jeremy Giovando	COE Seattle
Dave Benner	FPC
Steve Hall	COE Walla Walla
Shane Scott	PPC
Greg Lawson	Point Carbon
Kim Johnson	COE
Scott English	COE
Laura Hamilton	COE
Barry Espenson	CBB
Doug Baus	COE
Dan Feil	COE
Rob Dies	Iberdrola Renewables
Glen Trager	Shell Energy
XX	Seattle City Light
Ruth Burris	PGE
Rob Allerman	Deutsch Bank
Mike Butchko	Powerex
John Hart	EWEB
XX	Puget Sound Energy
Russ Kiefer	Idaho
Bill Rudolph	NW Fish Letter
Holli Krebs	JP Morgan

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday June 16, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

**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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for June 2 and 9, 2010 [\[Meeting Minutes\]](#)
3. Hanford Reach Final - *Russell Langshaw, Grant County PUD*
 - a. [Priest Rapids Operations 2010](#)
4. Libby Operations - *Steve Barton, COE-RCC*
5. Dworshak Operations - *Steve Barton, COE-RCC*
6. Lower Granite Barge Incident - *Steve Hall, COE-NWW*
 - a. [Lower Granite Site Plan](#)
7. Summer 2010 Treaty Fishery - *Tom Lorz, CRITFC*
 - a. [SOR 2010-C3](#)
8. Bonneville Powerhouse Two Unit Operations - *Paul Wagner, NOAA Fisheries*
 - a. [SOR 2010-03](#)
9. Spill Priority List - *Paul Wagner, NOAA Fisheries*
10. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality

- i. [May 2010 %TDG Summary Report](#)
11. Other
- a. Set agenda and date for next meeting - **June 23, 2010**
 - b. [\[Calendar 2010\]](#)

*Questions about the meeting may be referred to:
[Steve Barton](#) at (503) 808-3945, or
[Doug Baus](#) at (503) 808-3995*

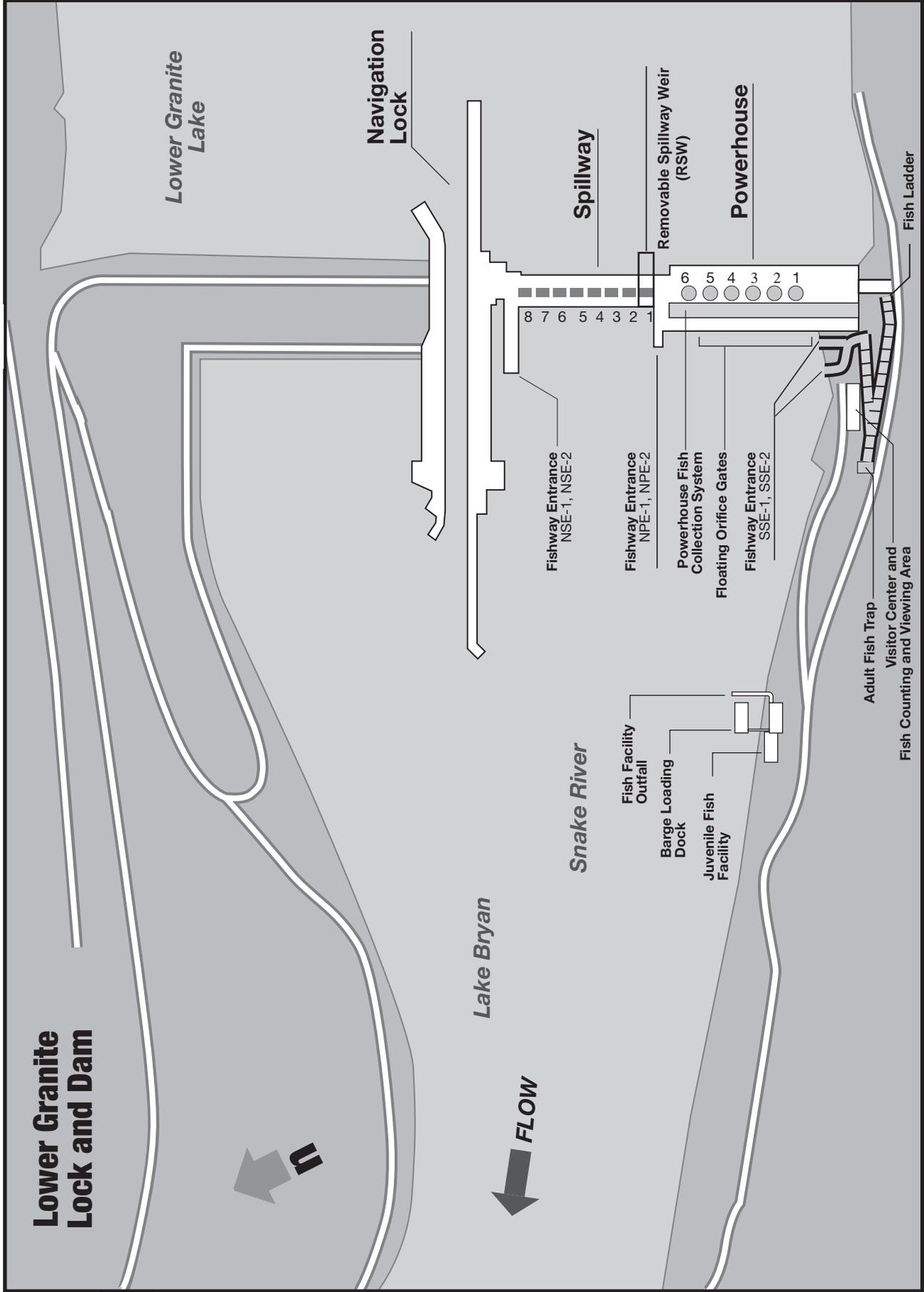
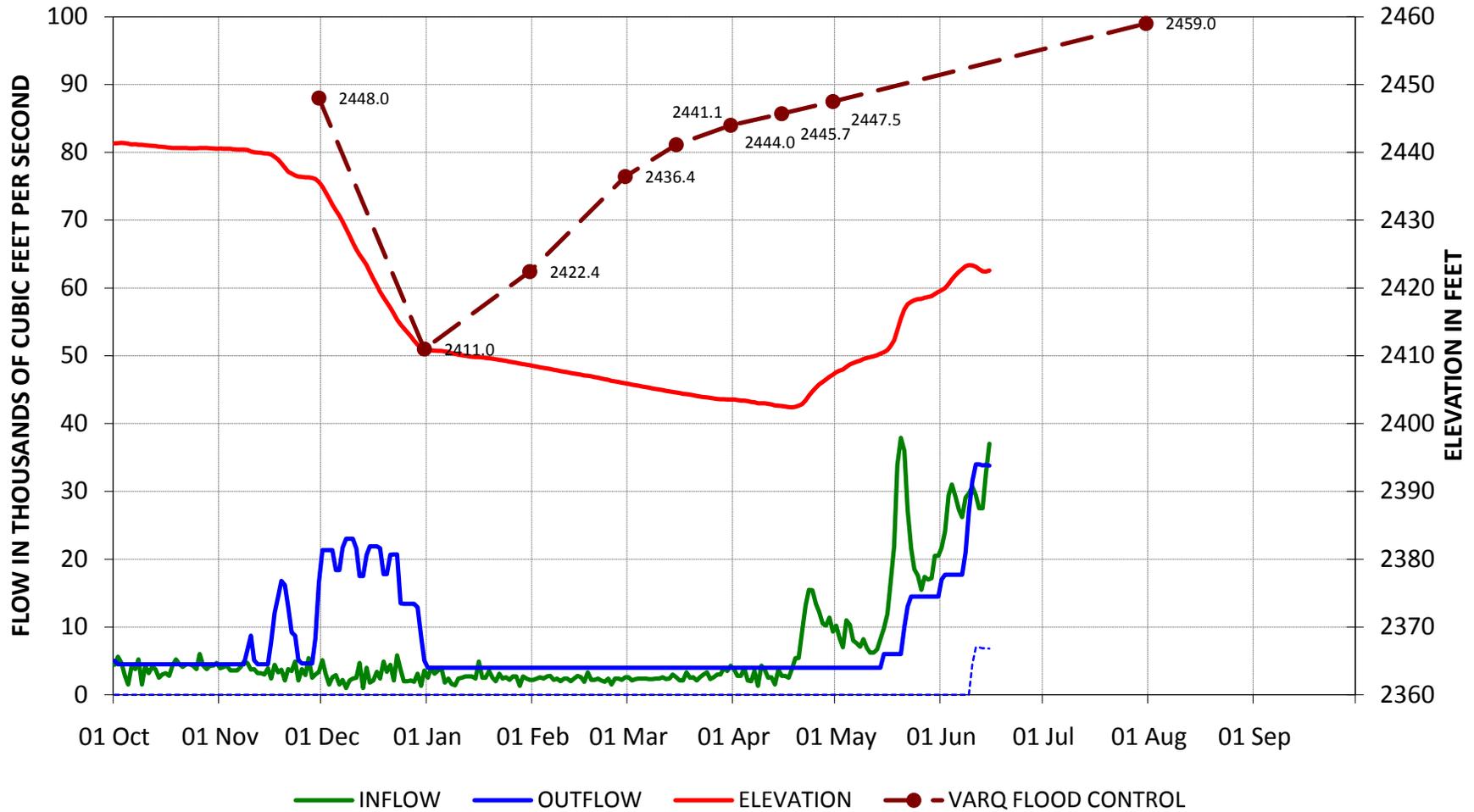


Figure LWG-1 Lower Granite Lock and Dam general site plan.

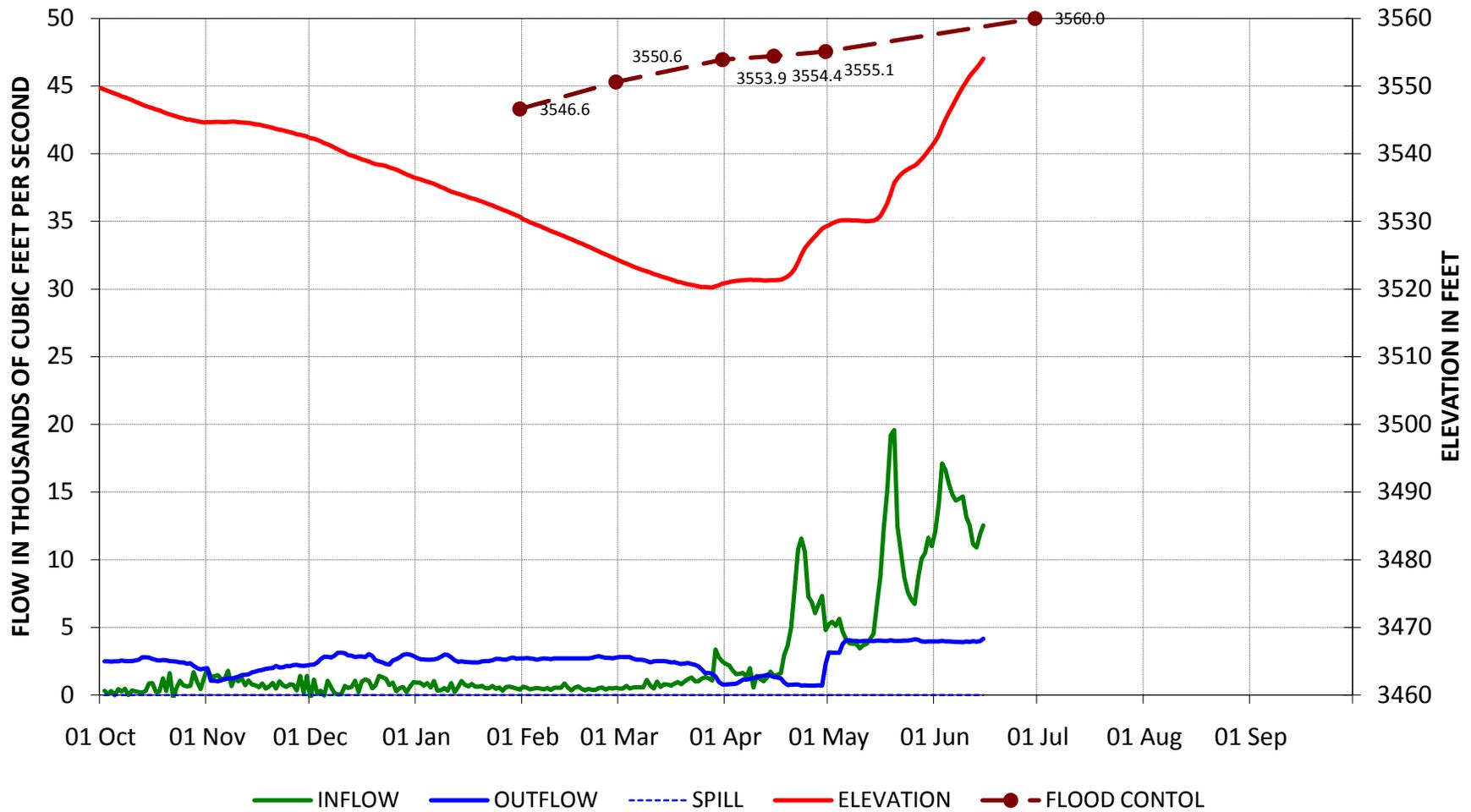
LIBBY DAM AND RESERVOIR

Water Year 2010



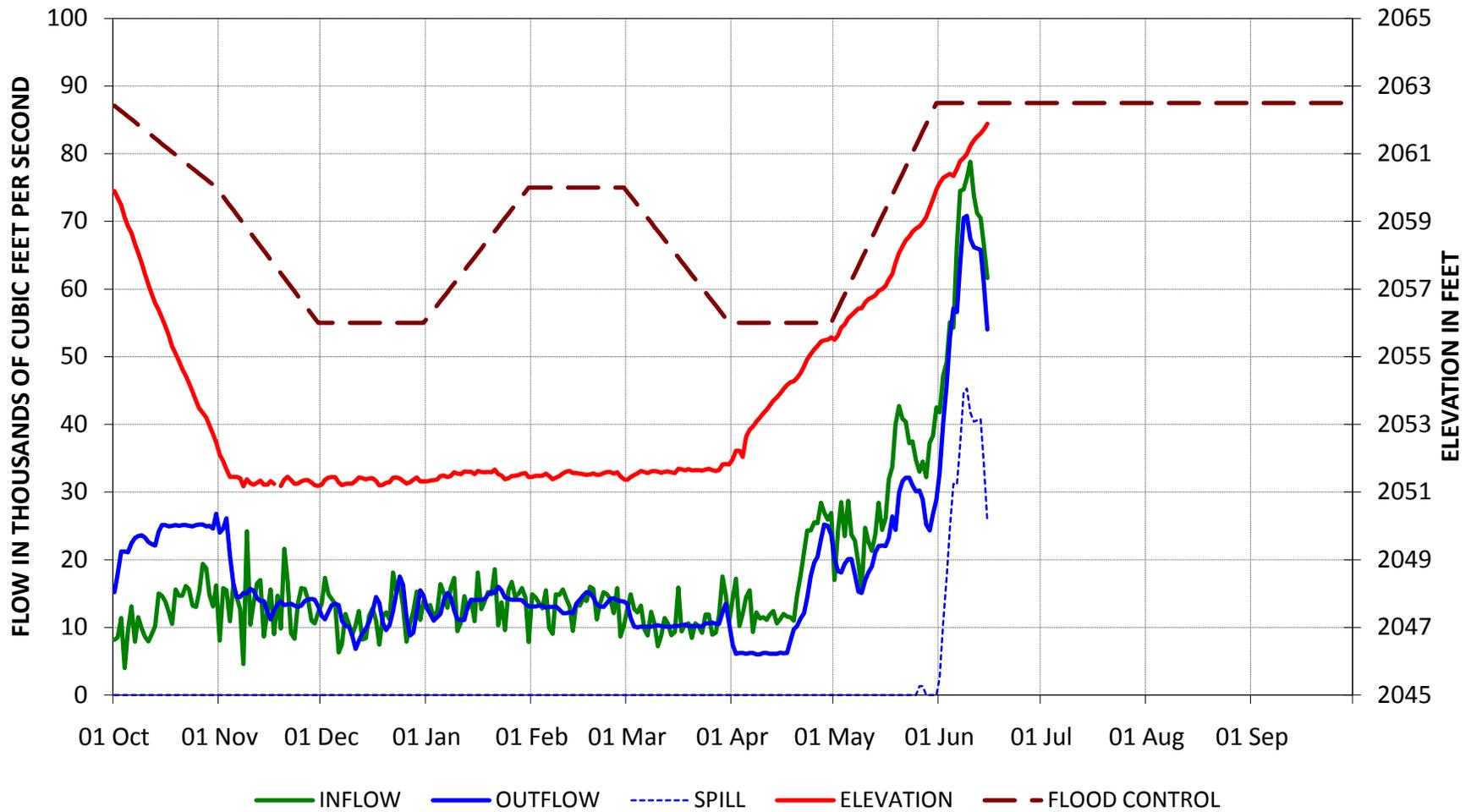
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



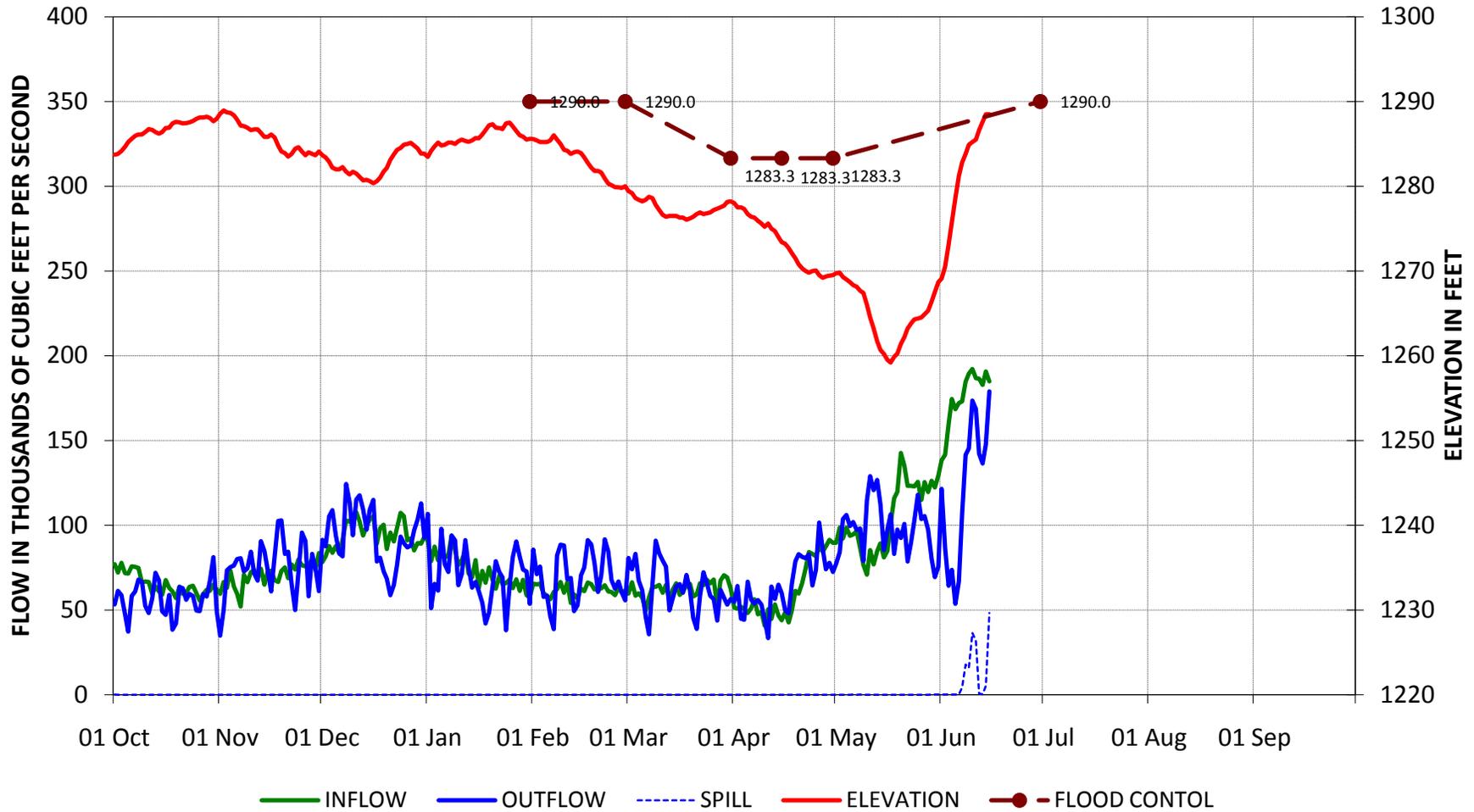
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



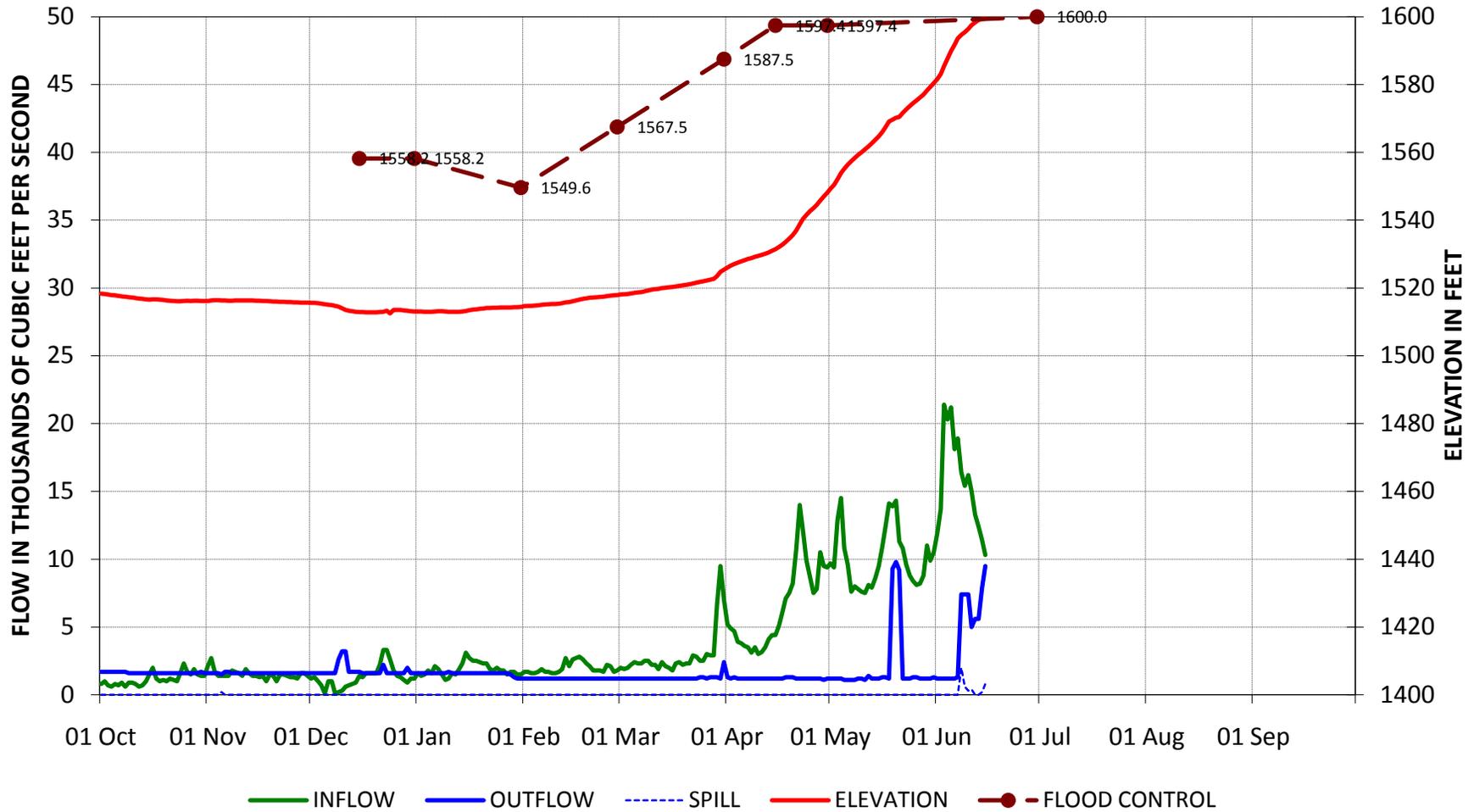
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



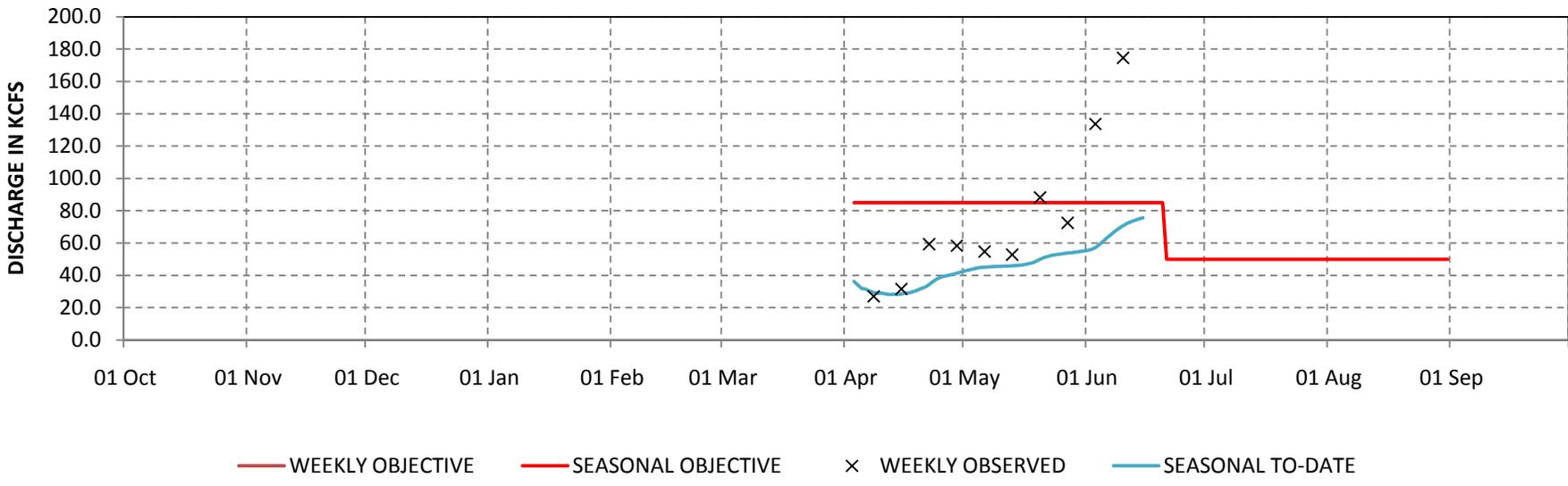
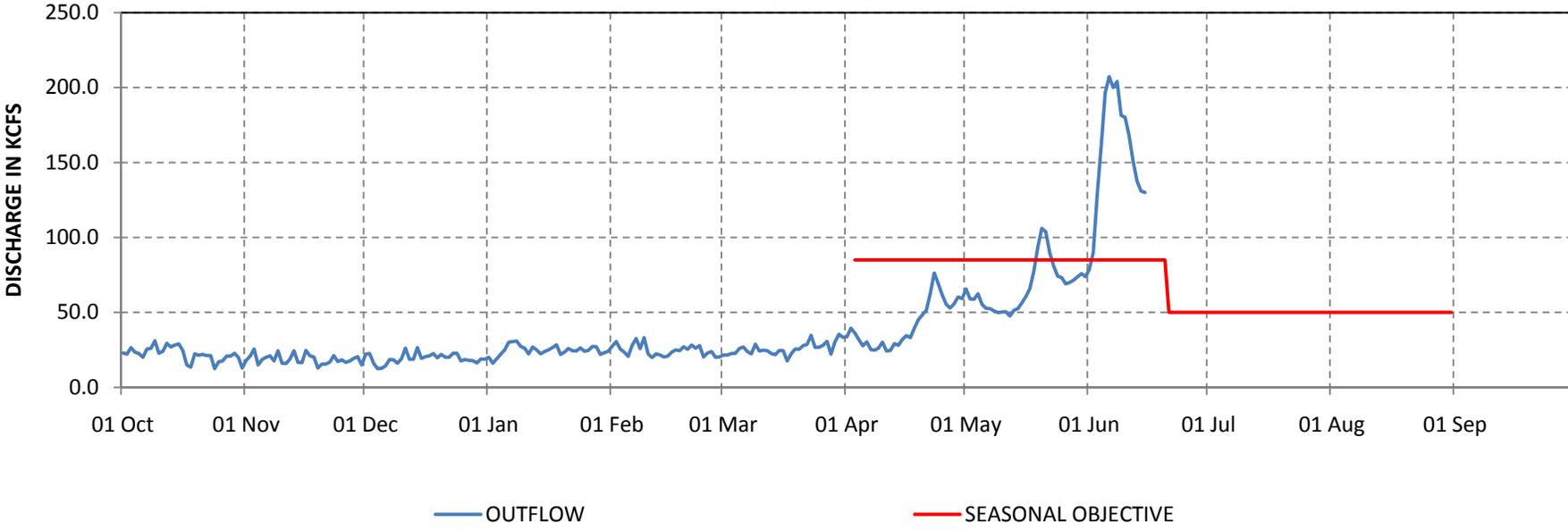
DWORSHAK DAM AND RESERVOIR

Water Year 2010

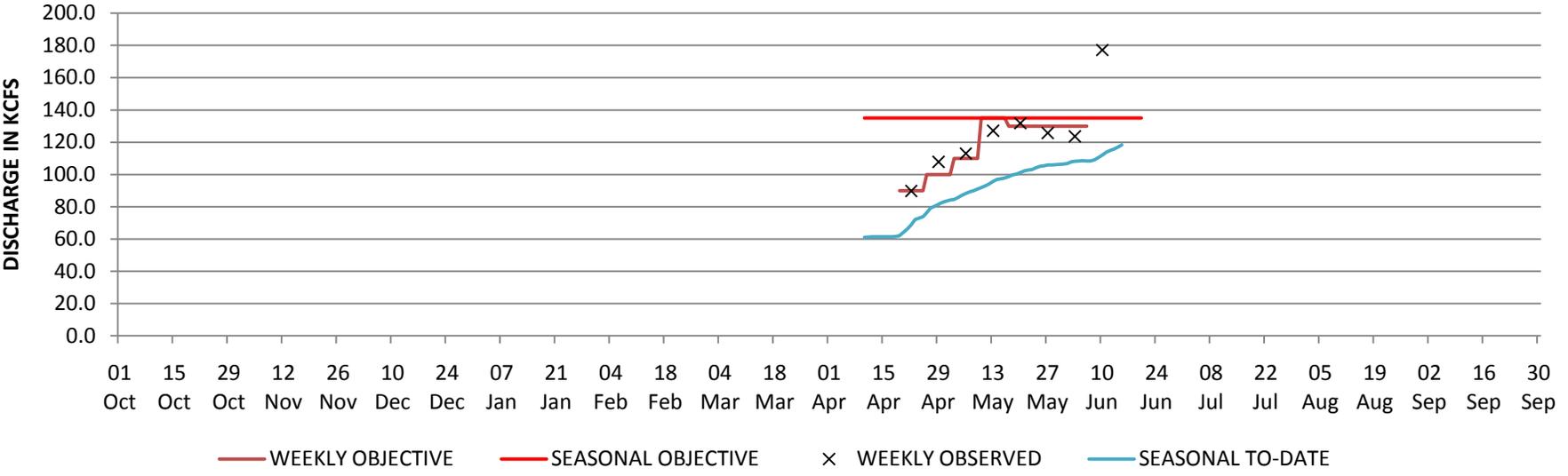
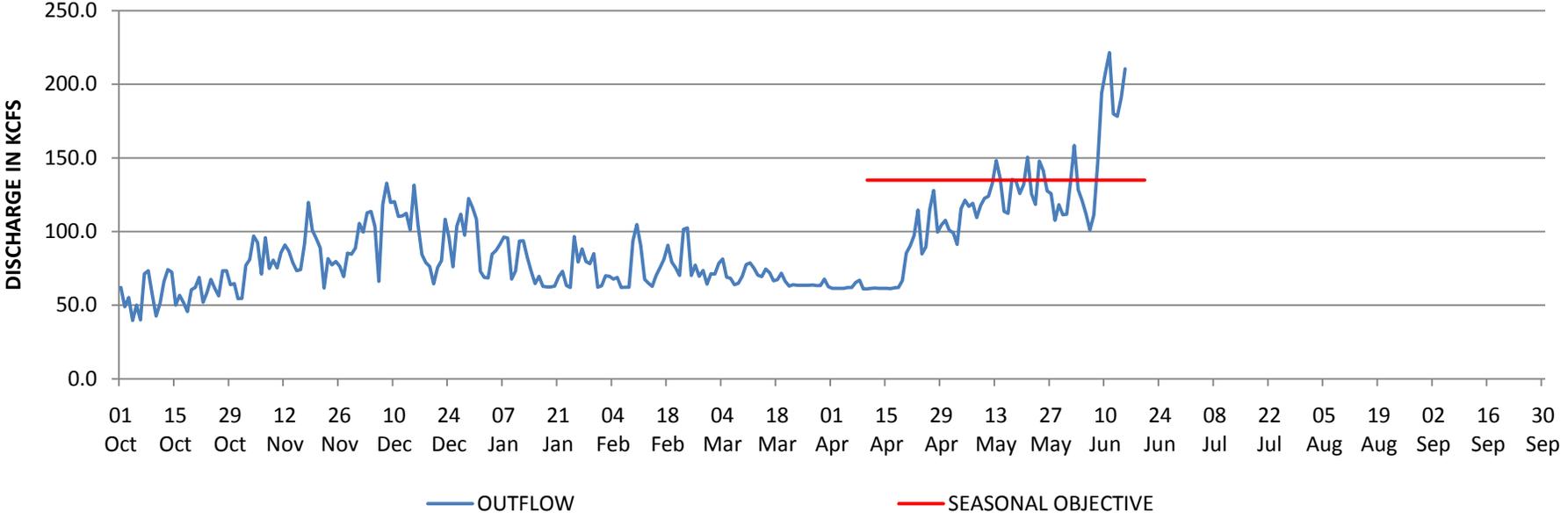


PROJECT DISCHARGE SUMMARY

SNAKE RIVER AT LOWER GRANITE DAM

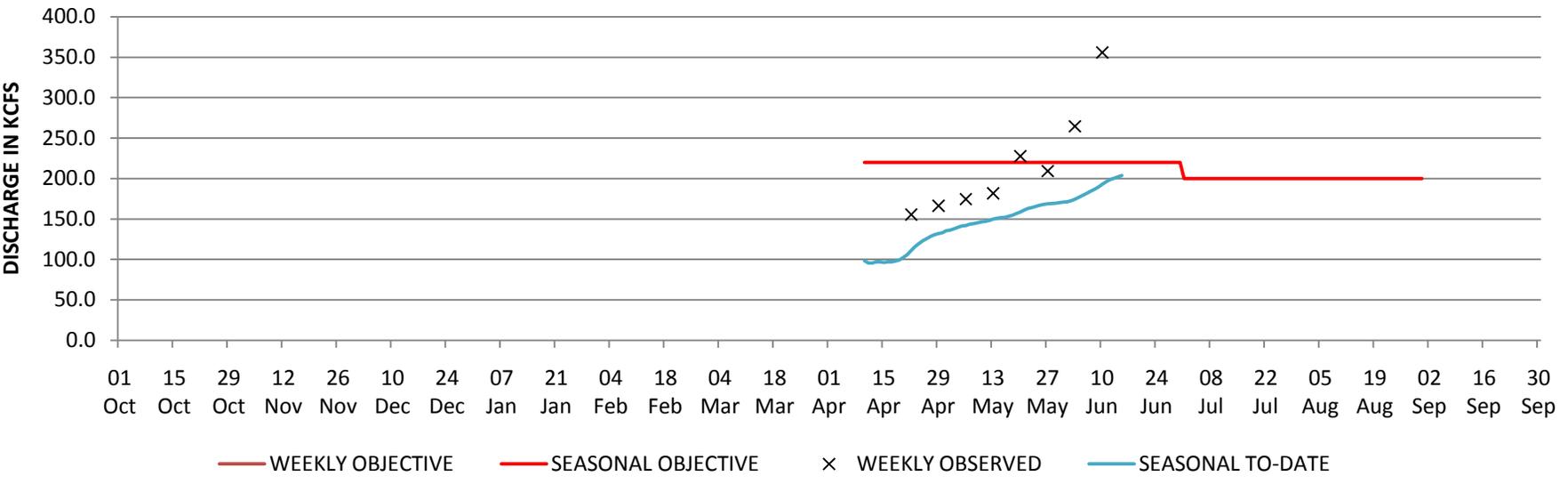
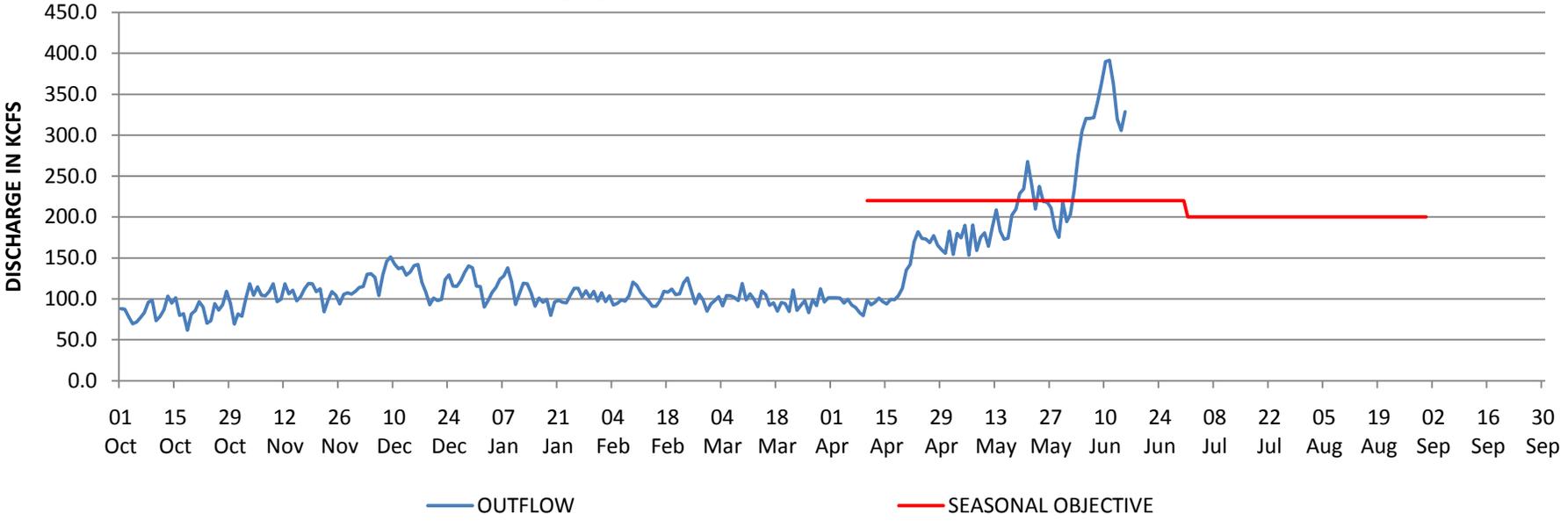


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM



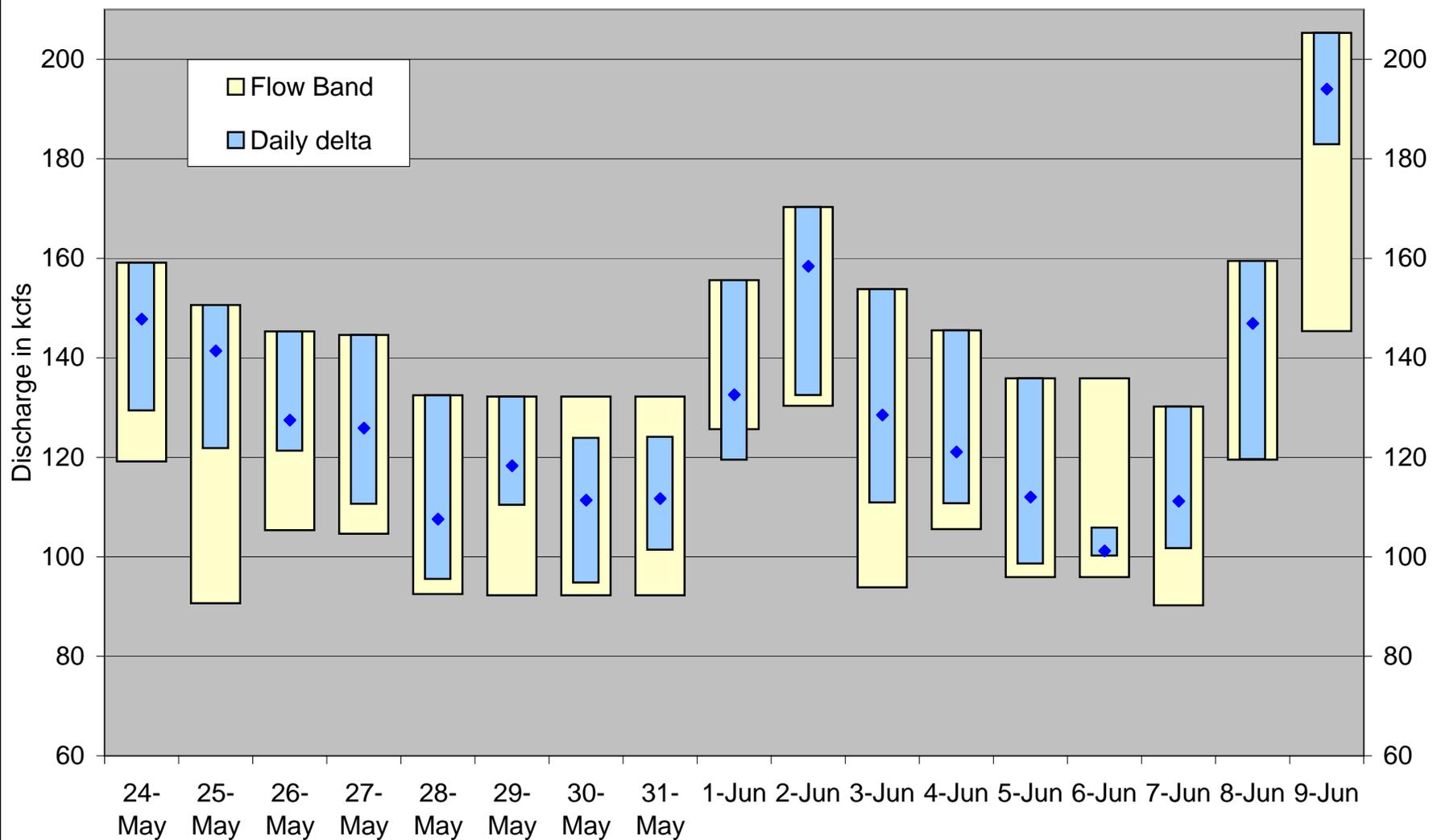
PROJECT DISCHARGE SUMMARY

COLUMBIA RIVER AT McNARY DAM



Priest Rapids Operations 2010

Number of exceedances: 0



COLUMBIA RIVER REGIONAL FORUM TECHNICAL MANAGEMENT TEAM

June 16, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

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.

Meeting Minutes

Official Minutes and Facilitator Notes from the June 2 and June 9 TMT meetings were open for comment. With no changes made to the 6/2 official minutes or facilitator’s notes, they were considered final.

With regards to the 6/9 meeting, the following edits were suggested for the facilitators’ notes:

- Libby Operations, second paragraph: Rick Kruger, Oregon, provided language to clarify the specifics of the agreed-to operation and that it remains flow neutral for the Lower Columbia:
 - add: flow neutral “for the lower Columbia River” in the second sentence
 - add: Grand Coulee would fill ½’ lower than full “in order to achieve flow neutrality” to the last sentence.
 - **Action:** Kruger and Steve Barton will also coordinate to revise the language just above the Libby polling section.
- Summer FOP: Clarify that the TSWs will be ‘removed’ at McNary. (note: the COE showed TMT the language that had been submitted to/finalized by the court last week and was posted to the TMT web page.)

The following edit was suggested for the 6/9 official minutes:

- Operations Review, p. 8: remove “a lot” and just say that Grand Coulee “filled.”

Action/Next Steps: TMT will look to finalize the 6/9 facilitator’s notes and official meeting minutes at the 6/23 TMT meeting.

Weather Update

Steve Barton, COE, reported on recent changes in precipitation. He shared data for the first 14 days in June: the Columbia River above The Dalles was 241% of normal (vs. 95% for the October-June period); the Snake above Ice Harbor was 191% of normal (vs. 99% of normal Oct-June); and above Grand Coulee was 176% of normal (vs. 87% of normal Oct-June). He also noted that the June final January-July water supply forecast at The Dalles was 74 MAF (69% of normal), but that the forecast had assumed a lesser amount of precipitation than is currently in the system. Departures from normal in terms of inches were as follows: .85” above Grand Coulee, 1.3” above Ice Harbor; and 1.18” above The Dalles.

Action/Next Steps: A water supply forecast update will be shared at the 6/23 TMT meeting.

Libby Operations

Steve Barton, COE, shared an update on operations at Libby to support sturgeon. The project spilled 5 kcfs on 6/10 and then began ramping up toward 10 kcfs while managing for TDG. Barton said the hourly spill average was 6.8 kcfs and the maximum 12-hour TDG average was 122.87%. Spill is planned to end on 6/17 at which time the project will go to full powerhouse, releasing the remaining sturgeon volume out by the end of June. The COE confirmed its intention to move all the water out for sturgeon by June 30, as planned, and will verify this accounting through its STP runs.

Action/Next Steps: An update will be provided to TMT during the 6/23 meeting. Fish data will also be provided by the USFWS at the next meeting.

Dworshak Operations

Steve Hall, Walla Walla District COE, reported that the increase in precipitation has improved the likelihood to fill Dworshak. The snow line was at about 6,100 feet, meaning that about 5% of the snow covered area remained. Given the conditions, the COE planned to operate Dworshak at full powerhouse this week (~9.5 kcfs) to slowly and steadily fill the project. Inflows were expected to drop below powerhouse at the end of this week, at which time the COE will refill the project within the top foot of full (elevation 1,600'). The project will pass inflow for the rest of June to meet the desire to release the water into the lower river. Current inflows have been in the range of 10-12 kcfs.

Hall added that the COE will develop its temperature modeling and will share a preliminary run on 6/23 and full analysis at the 6/30 TMT meeting. It was noted that work will be done on the model and TMT may see some changes as soon as July. The COE has been targeting a 43-45° degree range based on past requests. (The Salmon Managers may request a slightly warmer target for incubating hatchery fish and will follow up with this request if so desired.)

Lower Granite Barge Incident

Steve Hall, Walla Walla District COE, shared a visual of the Lower Granite lock and dam site plan, and pointed out the floating guide wall that was hit by a boat heading downstream on Friday, 6/11. Hall reported that the guide wall was loosened from the key and began to float away; to slow the velocity of the water, spill bays 6-8 were shut off and the wall was retrieved and secured with a temporary key. He said the COE expects the permanent repair to be complete by the end of June, and in the interim, will operate spill out of bays 1-5 instead of bays 1-8. Hall clarified that spill volume will be the same during the repair. COE fish biologists did not think this short term operation would have any impact on fish. As the tow boaters have expressed concerns for navigation during high flows, the COE is seeking a long term solution to remedy the issue.

The salmon managers expressed concerns that this operation may create an eddy and increased TDG levels, and suggested the need to get back to the preferred spill pattern as soon as practical. While there had been no reports of an eddy being formed up to this

point, the COE agreed and noted their intent to return to normal operations as soon as possible. A question was asked about the possibility of providing a lesser amount of spill through any of bays 5-8 during the fix; the COE was not able to answer the question during today's meeting.

Action/Next Steps: The COE will provide an update on the repair at the 6/23 TMT meeting.

Treaty Fishing

Tom Lorz, CRITFC, shared that an operations request to support treaty fishing had been submitted to the COE for June 16-18 and June 22-24; the request was to operate Bonneville, The Dalles and John Day within a 1.5 foot operating band. Tom thanked the COE for providing very smooth operations to date. The COE responded that they issued teletypes to meet the request as written. Steve Barton, COE, noted that there may be some variability in elevations given the high flows currently in the system.

Hanford Reach Update

Russell Langshaw, Grant County PUD, provided a 2010 Priest Rapids Operations Graph depicting protection flow band operations from May 24-June 9. Overall he said it was a successful year, with just one exceedance out of the flow band constraints on 6/1, which followed a holiday weekend. Minimum, maxes, averages and daily deltas were shared. Russell offered to provide a more complete review at the TMT Year End Review.

Bonneville Powerhouse Operations: SOR 2010-03

Paul Wagner, NOAA, presented the SOR on behalf of all the signatories: NOAA, USFWS, Washington, Idaho, Oregon, CRITFC, Nez Perce Tribe and Shoshone-Bannock Tribes. The request was to 'narrow the operating range' to 14 kcfs at Bonneville's Powerhouse 2 to address descaling issues occurring from high flows and debris build up at the project. He suggested the issue was similar to what occurred in 2008, though not as severe thanks to improved screen cleaning. Sockeye were observed at a 40% descaling rate while Fall Chinook descaling was up to 5%. No gas bubble trauma had been observed at the project at this point. Wagner said that the Salmon Managers had considered adult fallback issues with this proposed operation, and concluded that since no problems had been observed to date, addressing the descaling problem was the primary concern. Russ Kiefer, ID, noted that this SOR was intended to be a short term response and solution to the acute problem.

The COE responded that its water quality team reviewed the request and did not anticipate any TDG issues to arise if implemented. The COE also clarified that the request was for a maximum of 14 kcfs out of PH 2. BPA asked whether to consider operating PH 1 outside of 1% to avoid TDG exceedances; the Salmon Managers responded with their preference to implement the request as described to address the descaling problem.

The COE also shared that a test planned at Bonneville will require full flexibility of the units and was anticipated to begin as early as June 20, when flow conditions are likely to recede to a point to allow for the test. The Salmon Managers responded that they hope the flow recession will reduce the descaling issues so the requested operation could conclude

coincident with the start of the test – and if not, stated a likely preference to address the descaling issue as priority over the test.

The COE agreed to operate the request as written at least until the start of the planned test. TMT members present at the meeting were polled to confirm support for the operation:

- Idaho – support
- Montana – support
- Oregon – support
- CTUIR – support
- USFWS – support
- BOR – support
- BPA – no objection, but prefers to avoid exceeding gas caps at the project
- COE – supports, with the caveat that need to revisit when the test is planned to begin.

Action/Next Steps: The COE will implement the SOR as written, and they clarified that Bonneville powerhouse 1 will continue to operate within 15 peak efficiency. TMT will revisit this issue at the 6/23 meeting – and a conference call may be convened prior to then if needed to address timing of the spill test.

Spill Priority List

Paul Wagner, NOAA, shared an updated preferred spill priority list on behalf of the salmon managers. The preference was for the following order for the first four projects: Bonneville, McNary, John Day and The Dalles. The remaining projects would stay in the order that was shared by the COE via email on 6/11.

The COE responded with support for the change to the first four preferences, and added a further change to place Chief Joseph just above Grand Coulee. The Salmon Managers agreed to this added change, and with that, the COE said the new spill priority list would go into effect this afternoon.

Operations Review

Reservoirs: John Roache, Reclamation, and Steve Barton, COE, reported on reservoir operations. Grand Coulee was at elevation 1288.5' and passing inflows. Hungry Horse was at elevation 3554.14' with 12 kcfs inflows and 7 kcfs outflows. Libby was at elevation 2422.55', with 37 kcfs inflows and 33.8 kcfs outflows. Albeni Falls was at elevation 2061.88' and near full, with 61.6 kcfs inflows and 54.0 kcfs outflows. Dworshak was at elevation 1599.44', with 10.3 kcfs inflows and 9.5 kcfs outflows.

Lower Granite day average outflows were 130 kcfs (compared to 75.6 kcfs for the seasonal average); Priest Rapids day average flows were 210.5 kcfs (177.2 kcfs weekly average and 118.3 kcfs seasonal average); and McNary day average flows were 328.8 kcfs (355.8 kcfs weekly average and 203.9 kcfs seasonal average).

Fish: Paul Wagner, NOAA, provided a fish passage update. Juvenile yearling Chinook were nearly done on the Snake River, with less than 1,000 passing per day. 4,000-6,000

were passing per day on the Lower Columbia. Subyearling Chinook numbers were declining on the Snake River, with a peak 115,000 passing Lower Granite on 6/5 (Paul noted this was earlier than past years), 112,000 passing Little Goose on 6/12 (down to 15,000 this week) and 100,000 passing Lower Monumental on 6/10 (down to 20,000 this week.) The peak in passage, he noted, was mostly due to hatchery fish, with the wild run coming next. Further down, numbers ranged 70,000-80,000 at McNary and 35,000 at Bonneville. Steelhead passage patterns were similar to Chinook. Sockeye were all but gone from the Snake River projects and passage patterns were similar in the lower river to other stocks.

Russ Kiefer, Idaho, noted that the COE's implementation of a continuation of spring-like conditions at McNary supported wild Chinook, steelhead and other stocks and overall was a good operation.

Adult summer chinook were passing at 2,000/day at Bonneville; steelhead were passing around 500/day; shad passage numbers were high; and sockeye were passing at about 5,000/day. Snake River passage slowed during the high flow periods, then picked up again around 6/13.

Power: Nothing to report.

Water quality: Scott English, COE, said involuntary spill has led to TDG exceedances but that the system is coming back into balance. He provided a May 2010 TDG summary report, noting 28 total exceedances all under the Type 3 category (due to uncertainties when using best professional judgment). June has seen a lot of exceedances, mostly in the 6/5-6/11 timeframe due to involuntary spill.

The next TMT meeting will be: face to face on 6/23 at 9:00 am.

Agenda items will include:

- Notes/Meeting Minutes Review
- Dworshak Operations
- Libby Operations
- Lower Granite Floating Guide Wall Repair Update
- Treaty Fishing
- Bonneville Operations
- Operations Review

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 16, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the COE, USFWS, Oregon, NOAA, Idaho, BPA, BOR, 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. Review Meeting Minutes for June 2 and 9

Rick Kruger (Oregon) commented on the Libby operations section of the June 9 facilitator's notes:

- The second paragraph needs more distinction between release of the 40 kaf by June 30 and the way it is metered out of the reservoir. The second sentence concludes, "...while maintaining a flow neutral operation." Add "for the lower Columbia River and all of the 40 kaf released by June 30."
- The paragraph that begins, "The COE asked TMT members..." needs a clearer definition of the operation.

Kruger will email his comments to the COE, and the COE will clarify that the 40 kaf remaining in Libby after June 30 is equivalent to half a foot of elevation in Grand Coulee by end June, or 1,289.5 feet elevation instead of 1,290 feet. The equivalent volume will be subtracted from the Libby releases.

Kruger also commented on the summer 2010 Fish Operations Plan. The TSWs at McNary will be removed, not just unused as the 2010 FOP currently states. The spill pattern will not be the same as last year, as the FOP states, because that pattern was designed for use of the TSW. The spill pattern that will be used is from an old Fish Passage Plan before the TSW was installed. This will also be corrected in the notes and minutes.

John Roache (BOR) commented on the June 9 official minutes under "Operations Review, page 9:

- Under Grand Coulee, delete "a lot" so the sentence reads, "Grand Coulee spilled..."

There were no comments on the June 2 facilitator's notes so those are considered final.

3. Hanford Reach Final Report

Russell Langshaw (Grant PUD) gave a final report on the 2010 Hanford reach protection program. After getting off to a slow start the first few days, compliance was 100% until protection flows ended June 9. Figure 3b attached to today's agenda covers May 24-June 9. During that time, Priest Rapids Dam had mean daily discharges of 129 kcfs, with a minimum of 101 kcfs and a maximum of 194 kcfs. Minimum flows ranged from 95-183 kcfs, with an average of 115 kcfs. Maximum flows ranged from 106-205 kcfs, with an average of 146 kcfs. Daily deltas ranged from 6-43 kcfs, with an average of 30 kcfs.

Langshaw will give a presentation on the Hanford Reach operation at the TMT annual review this fall.

4. Water Supply Forecast Update

Precipitation data for the first 14 days of June are remarkable, Barton said:

- Columbia River basin above The Dalles Dam – 241% of normal (or 1.18 inches more than normal)
- Snake River above Ice Harbor – 291% of normal (1.3 inches)
- Snake River above Grand Coulee – 176% of normal (0.85 inch)
- Kootenai basin – 182% of normal (0.94 inch)

These differ widely from percentages for the whole water year:

- Columbia River above The Dalles– 95% of normal
- Snake River above Ice Harbor– 99% of normal
- Snake River above Grand Coulee – 87% of normal
- Kootenai River basin – 87% of normal
- Flathead River basin – 96% of normal

As of June 7, the final January-July runoff volume forecast from the RFC is 74 maf, 69% of normal, Barton reported. The RFC precipitation forecast assumes that precipitation will vary from 150% of normal for the first half of June to normal for the rest of the month. Conditions are slightly wetter at present than the RFC forecast assumed. A high percentage of normal doesn't necessarily indicate large volumes in the June data – less than an inch for the Snake and Kootenai basins, Kruger pointed out.

The RFC's mid-month water supply forecast will be available for discussion at the next TMT meeting June 23.

5. Libby Operations

The COE initiated spill for the sturgeon operation at Libby Dam beginning with 5 kcfs on June 10 and increasing toward 10 kcfs while tracking TDG levels, rather than starting out with 10 kcfs spill, Barton said. Hourly spill ranged from 6.5 to 9 kcfs, with a daily average of 6.8 kcfs. Spill never got to 10 kcfs due to gas production. The highest 12-hour average TDG reading was 122.87%, which is on the threshold of Montana's water quality standards waiver.

The sturgeon operation is scheduled to continue until the morning of June 17, when outflows drop down to full powerhouse, and disposition of the remaining sturgeon volume and phase 2 storage extends into July. In response to USFWS concerns about the STP volumes being released, the COE will double-check its STP model runs, Barton said. This issue will be part of next week's TMT discussion.

6. Dworshak Operations

Dworshak reservoir is 0.55 feet from being full thanks to enhanced precipitation, and has been discharging full powerhouse flows, currently 9.5 kcfs. There's little operational flexibility in terms of flood control due to recent high inflows, Steve Hall (COE Walla Walla) said. The remaining snow covered area is about 5%, meaning almost no snow, so most of the runoff is due to precipitation.

In order to avoid topping off the reservoir and spilling above the gas cap, the COE has been operating the project at full powerhouse discharges for a slow and steady refill, Hall said. Inflows are 10-12 kcfs. By the end of this week, the current forecast says inflows will drop down below full powerhouse. When that occurs, the COE will try to top off the reservoir at elevation 1,600 feet, passing inflows for the rest of June. The higher the reservoir elevation, the less water it takes to produce full powerhouse flows.

With summer's high temperatures approaching, the COE is working on a full model analysis to be used for temperature control at Dworshak. The model will be ready to use by June 30. Preliminary modeling results should be available by next week. For now, the COE is targeting 43-45 degrees F per a request from the Dworshak hatchery.

Russ Kiefer (Idaho) thanked the COE for its response to the salmon managers' request to refill Dworshak as soon as possible. TMT will continue to monitor Dworshak operations closely over the next several weeks.

7. Lower Granite Barge Incident

On the morning of June 11, a towboat and a barge in the Lower Granite navigation lock hit a floating guidewall, sheared off the bolts at the key where it's attached to the dam, and sent the guidewall floating free, Hall reported.

The COE immediately shut off flows to spill bays 6-8 and rigged the guidewall to the dam with a temporary key. Repairs are expected to take about 2 weeks. Until then, the spill pattern will be disrupted, with the full volume of spill passing through bays 1-5 and spill turned off in bays 6-8. Special bolts that must be made to order are what's taking 2 weeks. The COE is planning to complete the repairs by the end of June.

The accident happened at high levels of spill. Tow boaters have told the COE that high flows create a sideways current underneath the guidewall that makes navigation in and out of the lock difficult. As a long term operation, the COE is considering whether spill might need to be modified, reduced or eliminated in bays 7 and 8 while the navigation lock is in use.

Because the fish ladders are on the south side of the project, there isn't as much need for spill through bays 6-8, Hall said. The impact of the repairs on fish migration is expected to be minimal. Nevertheless it has the potential to create eddies that entrain fish, Kruger said. Tom Lorz (CRITFC) added that the spill patterns have been designed for best egress at Lower Granite, and more spill per bay means more gas. The sooner spill returns to normal, the better. Kruger asked the COE to consider whether spill through bays 6-8 might be used to break up eddies. TMT will be following this issue closely, with an update at the next meeting July 23.

8. Summer 2010 Treaty Fishery – SOR 2010-C3

For the fall Chinook fishing season, SOR-2010-C3 requests 1.5 foot bands as a hard operating constraint at Bonneville, John Day and The Dalles, from 6 am on June 16 to 6 pm on June 18, and 6 am on June 22 to 6 pm on June 24. Tom Lorz (CRITFC) thanked the COE for an excellent job of maintaining an even tighter band than 1 foot elevation.

The COE will implement the SOR as written, with a commitment to stay within the 1.5-foot bands. However, there could be more variability as the COE continues to manage high runoff, Barton said.

9. Bonneville 2nd Powerhouse Unit Operations – SOR 2010-03

In response to a high rate of sockeye descaling observed at Bonneville, this SOR asks the COE to narrow the operating unit range at the Bonneville 2nd powerhouse to low to mid range of peak efficiency, or approximately 14 kcfs, Paul Wagner (NOAA) explained. The current situation is similar to 2008 when the fish screens at Bonneville had to be pulled because project staff couldn't keep up with the rate of debris accumulation. This year the situation is not as extreme. Sockeye descaling rates were 40% but have been declining. Fall Chinook show a 5% rate of descaling, which is higher than desirable.

FPAC members recognize that turning down the turbine loading will increase the amount of water passing through the spillway, Wagner said. There

have been no signs of gas bubble trauma at Bonneville, although some fish with GBT signs have been observed at Little Goose. Another concern is adult fallback which tends to increase as spill rises above 140 kcfs. Summer Chinook and sockeye are passing, and sockeye don't have much of a problem with fallback. However, fall Chinook are potentially more at risk. Nonetheless FPAC agreed the adverse effects of descaling are worse than the effects of fallback, so the turbine loading should be reduced. Signatories to the SOR include NOAA, USFWS, Washington, Idaho, Oregon, CRITFC, and the Nez Perce and Shoshone Bannock tribes.

The SOR also addresses research done by the Northwest Science Center on fish passage through turbines at different loadings. At higher turbine loadings, the range of mortality and descaling was found to be higher. When fall Chinook encounter higher flows through turbines and more turbulence in the gatewells, they experience higher rates of descaling and mortality, especially smaller fish. Russ Kiefer (Idaho) added that the descaling patterns indicate fish are getting caught against the clogged screen and trying to swim along it. The solution proposed by the SOR is short-term while FFDRWG works on this problem.

After reviewing potential impacts of the SOR on water quality, which appear to be minor, the COE supports the SOR up to the point when the Bonneville spill test begins, estimated to be around June 20-22, Barton said. That is when flows are expected to be 300 kcfs or less, which is a hydraulic requirement for conducting the spill test as specified in the summer Fish Operations Plan. That means this SOR will provide 5-7 days of relief from the effects of clogged screens. Kiefer said conditions could become suitable for dropping the SOR's provisions when it's time to begin the spill test. The general consensus of signatories was that it would be better to delay the spill test rather than sacrifice fish to the effects of descaling, Kruger said.

Ruth Burris (PGE) asked whether the Bonneville 1st powerhouse will go to maximum capacity. This SOR applies only to the units in powerhouse 2 because powerhouse 1 is already at full load, Barton replied. The normal operation of those units at 1% of peak efficiency will not be affected by this operation.

Barton asked the FPAC members, if system conditions allow lower unit loading, would that be satisfactory? Yes, lower is better, Wills answered. Tony Norris (BPA) suggested exceeding 1% efficiency at the 1st powerhouse units and picking up extra flows in the 2nd powerhouse. The FPAC wants to pass as many juveniles as possible through the 2nd powerhouse because the 1st powerhouse is untested, Lorz said. Kruger agreed it's not a good idea to pass fish through the 1st powerhouse because the passage conditions to it are unknown. Wagner will check with Gary Fredricks (NOAA) on this.

TMT members were polled on this SOR. **Idaho, Montana, the Umatilla Tribe, NOAA, USFWS** and **Oregon** supported it; **BPA** and **BOR** had no objection. The **COE** supports the SOR until it impacts the Bonneville spill test and will implement the SOR accordingly. The COE will monitor the Bonneville fish

screen situation closely and notify TMT members when the river drops below 300 kcfs, a condition for starting the spill test. TMT will revisit Bonneville 2nd powerhouse operations at its next meeting June 23.

10. Spill Priority List

FPAC members have reviewed the spill priority list and placed Bonneville, McNary, John Day and The Dalles at the top in that order, Wagner said. John Day has been moved from the bottom of the list to third place. The rest of the proposed list is the same, with Ice Harbor next, followed by The Dalles and Chief Joseph.

The COE proposed to implement the list as proposed with one exception: Chief Joseph moves back down the list to precede Grand Coulee, pending further analysis of the effects of spill. There was no objection to the COE proposal.

11. Operations Review

Reservoirs. Grand Coulee is at 1,288.5 feet elevation, about 1.5 feet below full and passing inflows. Hungry Horse is at 3,554.14 feet elevation. Discharges were increased to 7 kcfs this morning in response to a forecasted rise from the current inflows of 12 kcfs to 17-18 kcfs over the next few days.

Libby is at elevation 2,422.55 feet with inflows of 37 kcfs, discharging 33.8 kcfs. Albeni Falls at elevation 2,061.88 feet is nearly full, with inflows of 61.6 kcfs and outflows of 54 kcfs, spilling 25.6 kcfs. Dworshak is at elevation 1,599.44 feet, with inflows of 10.3 kcfs and outflows of 9.5 kcfs.

Lower Granite is discharging 130 kcfs, with a seasonal average of 75.6 kcfs for spring. Priest Rapids discharged 328.8 kcfs yesterday, with a seasonal average of 203.9 kcfs; last week's average flow was 355.8 kcfs. McNary is discharging 328.8 kcfs, with a seasonal average of 203.9 kcfs.

Fish. Juveniles: Yearling spring Chinook are nearly gone from the Snake River. Fewer than 1,000 passed Lower Granite Dam on June 15, Wagner reported. Lower river passage numbers are 5,000 per day at McNary and a few thousand per day each at Bonneville and John Day.

Subyearling Chinook passage has been high. Peak counts were 112,000 subyearlings at Little Goose on June 12 (now 15,000 per day), and nearly 100,000 at Lower Monumental on June 10 (now 20,000 per day). These are largely hatchery releases, to be followed by the wild spring Chinook migration. Subyearling spring Chinook passage numbers have been 70-80,000 per day at McNary for the past 2 days, nearly 50,000 per day at John Day, and nearly 35,000 per day at Bonneville. SOR 2010-C3 (discussed above) was written mainly out of concern for these large numbers of subyearlings. Subyearling Chinook passage on the lower river projects is now in the 2,000 per day range.

Steelhead have mostly left the river system, and sockeye passage is nearly done at the Snake River projects. Kiefer thanked the COE for meeting Idaho's request to keep spring operations ongoing at McNary, though it was based on an overprediction of sockeye runs. Yearling passage at the lower Columbia projects is 5,000 per day at John Day and Bonneville.

Adults: Summer Chinook are passing Bonneville at the rate of a few thousand per day. Steelhead and sockeye passage at Bonneville is picking up to about 500 fish per day of each. In general, passage numbers have increased since flows receded.

Power. There was nothing to report today. The COE thanked BPA for its flexibility last week in managing lower Columbia River operations.

Water Quality. Spilling through gates 1-5 at Lower Granite in response to the barge incident produced a bulk spill pattern, which raised TDG levels. Scott English (COE) showed TMT the May TDG summary linked to today's agenda. Involuntary spill throughout the Snake and Columbia basins has resulted in numerous exceedances. High TDG levels have declined over the past few days.

12. Next Meeting

The next TMT meeting will be in person June 23, with Bonneville, Libby and Dworshak operations, repairs at Lower Granite, treaty fishing, and review of meeting minutes on the agenda.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Jim Litchfield	Montana
Doug Baus	COE
David Wills	USFWS
Rick Kruger	Oregon
Paul Wagner	NOAA
Russ Kiefer	Idaho
Laura Hamilton	COE
Don Faulkner	COE
Steve Hall	COE Walla Walla
Dan Feil	COE
Scott English	COE

Phone:

Tony Norris	BPA
John Roache	BOR
Tom Lorz	CRITFC
John Hart	EWEB
Jason Flory	USFWS
Tim Heizenrader	Centaurua

Glen Trager
Shane Scott
Jeremy Giovando
XX
Barry Espenson
Margaret Filardo
Bill Rudolph
Richelle Beck
Rob Allerman
Greg Hoffman
Scott Bettin

Shell Energy
PPC
COE Seattle
Seattle City Light
CBB
FPC
NW Fish Letter
DRA
Deutsch Bank
COE Libby Dam
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
WDFW : Cindy LeFleur / Charles Morrill **MT** : Jim Litchfield / Brian Marotz
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT MEETING

Wednesday June 23, 2010 09:00 - 12:00

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

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnm.net or call her at (503) 248-4703.*

AGENDA

1. Welcome and Introductions
2. Review Meeting Minutes for June 9 and 16, 2010 [\[Meeting Minutes\]](#)
3. Libby Operations - Steve Barton, COE-RCC
 - a. [Storage Accounting](#)
4. Dworshak Operations - Steve Barton and Steve Hall, COE
5. Lower Granite Guide Wall Repair - Steve Hall, COE-NWW
6. Summer 2010 Treaty Fishery - Tom Lorz, CRITFC
7. Bonneville Powerhouse Two Unit Operations - Paul Wagner, NOAA Fisheries
8. Operations Review
 - a. Reservoirs
 - i. [Summary Plots](#)
 - b. Fish
 - c. Power System
 - d. Water Quality
9. Other
 - a. Set agenda and date for next meeting - **June 30, 2010 Conference Call**
 - b. [\[Calendar 2010\]](#)

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

June 23, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator: Erin Halton

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.

Meeting Minutes

Official Minutes and Facilitator Notes from the 6/9 and 6/16 TMT meetings were open for comment. As the official minutes for 6/16 had not yet been posted, the team was given more time to review and will look to finalize these sets at the next face to face TMT meeting, currently scheduled for July 7.

Libby Operations

Steve Barton, COE, provided an overview of the current Libby operation: the project was operating for sturgeon operations and to release the 260 KAF of Phase II storage. Flows were ramping down and were being shaped according to the agreement reached during previous TMT discussions.

Scott Bettin, BPA, and Greg Hoffman, COE, shared that one male and four female sturgeons had been observed above Bonners Ferry, and that there was a ‘substantial presence’ of the fish in the river. Temperatures were 10°C out of Libby and 11.5°C at Bonners Ferry, and Hoffman suggested these were optimal conditions for spawning. He noted that tribal hatchery fish had successfully spawned.

Steve Barton went on to explain the accounting for Phase II storage and the shift in to July (graphs depicting this were also shared). With the conclusion of spill, and due to the volatile conditions and TDG concerns in the system, Barton clarified that not a lot of Phase II storage has been released to date. To provide a smooth ramp down to bull trout minimums, more than 40 KAF will need to be released – and it was suggested this could be as much as 80 KAF (equivalent to about 1 foot of elevation at Grand Coulee). One graph showed that about 66 KAF would be carried over in to July to meet the intent of the operation. TMT members thanked the COE for sharing the graphs and explaining the accounting.

Barton reported that the COE will produce an After Action summary of the operation relative to TDG. He said that while the presentation of the data might have caused some confusion, the reality was that the highest 12-hour average was 122.9% and the highest hourly TDG was 124%, so the COE managed the system within TDG limits. Barton suggested that there is much more certainty with the operation now that inflows will have no influence, and he clarified that the project is no longer spilling.

Action/Next Steps: An update will be provided to TMT during the 6/30 TMT conference call.

Dworshak Operations

Steve Barton, COE, reported that Dworshak was currently passing inflow, and turned to Steve Hall, Walla Walla District COE, to report more details of the Dworshak operation. Hall said that increased precipitation and a forecast for high inflows earlier in the week guided the COE to release 14.5 kcfs out of the project late on 6/21. The COE reduced outflows when the precipitation did not materialize and were working to touch full this week/weekend; the COE planned to back the project down to about ½' from full to provide cushion for any additional water that might enter the system. Hall reported that the COE is still working some glitches out of its temperature model and will provide results next week. Steve did note that stream temperatures were still cool as of today.

Action/Next Steps: An update will be provided to TMT during the 6/30 TMT conference call.

Lower Granite Guide Wall Repair

Steve Hall, Walla Walla District COE, updated TMT on the guide wall repair at Lower Granite. The COE explored the suggestion to shift the spill pattern per TMT feedback at the last meeting, but due to the limitations of the temporary restraining device and uncertainty around the timing and amount needed to shut spill off and turn it back on through different bays, the COE decided to maintain spill out of bays 1-5 during the repair. A dive performed on 6/22 revealed no damage to the cables and the key was being installed on to the wall today. The COE anticipated that the normal spill pattern, through bays 6-8, would resume by the end of the week.

Hall said that while the COE is not asking for reimbursement for damages caused by the boat that hit the wall (the COE had been warned and there were maintenance issues surrounding the incident), they were reviewing protocols for responding to warnings and will be doing some tests to explore long term solutions to address the issue in the future.

NOTE: Following today's meeting Steve Barton sent an email update to TMT members that read as follows: "*Repairs to the Lower Granite navigation lock guide wall were completed yesterday. During the repairs, spillbays 6-8 were out of service and all spill was distributed to bays 1-5. All bays are in service and the project resumed the spill pattern in the 2010 FPP at approximately 15:00 PDT 23 June.*"

Treaty Fishing

Tom Lorz, CRITFC, reported that net flight results from last week's fishing were not yet available but it was anticipated that a request for an additional one- to two-week operation for summer treaty fishing will be developed and shared with the COE by the end of this week.

Bonneville Powerhouse Operations

Paul Wagner, NOAA, reviewed the request submitted by the salmon managers last week for operations at Bonneville PH2 to address descaling issues due to high flows/debris build up. Since last week, the operation was implemented twice due to a second spike in

flows and per verbal agreements made between FPAC and the COE. As of today's meeting, the project was operating per the SOR and it was anticipated to remain as such until the end of this or next week, dependent on flows dropping below 300 kcfs. FPAC members thanked COE biologists and operators for their close monitoring and response to the changing conditions. Steve Barton, COE, added that the spill test planned for the project was being postponed until flows recede and descaling is no longer an issue.

Action/Next Steps: Though it is not expected, the COE will notify TMT if operations change, and there will be a check in on this issue at the next TMT meeting.

Operations Review

Reservoirs: Mary Mellema, Reclamation, and Steve Barton, COE, reported on reservoir operations. Grand Coulee was at elevation 1289.6' and passing inflows. Hungry Horse was at elevation 3557.37' with 13.3 kcfs inflows and 7 kcfs outflows. Libby was at elevation 2425.43', with 34.6 kcfs inflows and 20 kcfs outflows. Albeni Falls was at elevation 2061.76', with 70.7 kcfs inflows and 71.2 kcfs outflows. Dworshak was at elevation 1599.56', with 11.2 kcfs inflows and 11.2 kcfs outflows.

Lower Granite outflows were 112.8 kcfs. The seasonal average objective was 85 kcfs and actual was 78.1 kcfs. Priest Rapids outflows were 251.6 kcfs with a seasonal average of 126.7 kcfs. McNary outflows were 343.3 kcfs with a seasonal average objective of 220 kcfs and actual to date of 215.5 kcfs.

Fish: Paul Wagner, NOAA, provided a fish passage update. Adult passage counts at Bonneville were as follows: 25,000 sockeye/day (134,000 season total) and 3,500 summer chinook/day (53,000 season total). Both exceeded the 10-year average – sockeye by a large number. Juvenile yearling chinook counts were waning, with less than 1,000 per day at the Snake River projects and close to that in the lower river. Subyearling chinook counts were 17,000 at Lower Granite, 26,000 at Little Goose and 7,000 at Lower Monument; these were mostly hatchery fish. Passage appears to be earlier than normal this year. Paul noted a spike in lower river numbers due to hatchery releases. Steelhead counts were about 2,000 at Lower Granite but much lower at other projects.

Power: Nothing to report.

Water quality: Laura Hamilton, COE, referred TMT to the Water Quality Program web page. Under spill review information, she showed that TDG exceedances had occurred at McNary, Bonneville, Grand Coulee and Chief Joseph (the latter two according to the Colville Tribe's 110% standard) due to involuntary spill. She also reported that the system was calming down and TDG levels were dropping.

Next TMT meeting: 6/30 Conference Call at 9:00 am

Agenda items will include:

- Dworshak Operations
- Libby Operations
- Treaty Fishing
- Bonneville Operations

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 23, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT meeting was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of Oregon, Montana, USFWS, the COE, BPA, NOAA, BOR, Idaho, Washington 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. Review Meeting Minutes for June 9 and 16

Finalizing the official minutes and facilitator's notes for June 9 and 16 was postponed until the next face-to-face meeting July 7 so that people would have more time to review them.

3. Libby Operations

Barton gave a recap of Libby operations. The COE has fulfilled the SOR and is continuing the smooth ramp-down discussed in prior meetings to dispose of the 800 kaf sturgeon pulse, plus the remainder of the 260 kaf phase 2 storage.

Scott Bettin (BPA) and Greg Hoffman (COE Libby Dam) reported that 1 male and 4 female sturgeon have been spotted above Bonner's Ferry as of yesterday, June 22. It's been a successful season in terms of producing juveniles. The real proof of this year's operation will be in 3 years when these juveniles return. It is believed that a substantial number of sturgeon are still present in the river.

One of the challenges in managing spill for the sturgeon SOR has been controlling temperatures below the dam as spill receded. The COE was able to mitigate the effects of stopping spill, and temperatures out of Libby at now at 10 degrees C; 11.5 degrees C at Bonner's Ferry, optimal conditions for spawning. With these conditions, the tribe has been able to spawn all 11 of their fish in the hatchery as of Sunday, yielding 1.5 million eggs.

Following last week's conversation at TMT, the COE has deferred the proposal to shift 40 kaf of phase 2 storage into July to help create a smooth recession of Libby discharges, Barton said. In retrospect, the reservoir elevation would have been adequate without phase 2 storage to provide most of the spill that actually occurred, meaning not much of the phase 2 storage was actually used as spill for sturgeon. The COE is now refining its calculation of the volume

that's been carried over into July as being around 80 kaf, equivalent to about a foot of elevation at Grand Coulee.

Barton presented two charts attached to today's agenda that depict the sturgeon spill operation. The first chart called for 66 kaf released in July, the second for 41 kaf, a slightly steeper dropoff. Jim Litchfield (Montana) thanked the COE for its efforts to ramp the operation down gradually.

Total dissolved gas levels produced by the spill operation peaked at 122.9% in any given 24 hours of the sturgeon operation, while the highest hourly value was around 124% TDG. Though the TDG data were confusing, it appears the system was managed within TDG limits for Washington and Oregon.

The operation for sturgeon was still releasing flows of 600 cfs as of last Thursday, Barton said. The COE Seattle district was roundly congratulated on the success of the sturgeon spawning operation. TMT will check in on the operation during its June 30 conference call.

4. Dworshak Operations

Steve Hall (COE Walla Walla) gave an update. Dworshak reservoir is nearly full and has been passing inflows. On June 21 due to rains over the weekend, inflows were predicted to rise, and the COE released 14.5 kcf outflows late that day in preparation for flows that didn't materialize. Yesterday the COE dropped outflows and is in the process of topping off the Dworshak pool through this week and into the weekend. Then the plan is to drop about half a foot of elevation to protect against a rain event. The COE had no new modeling today and will present updated modeling results to TMT on June 30.

As far as temperature modeling goes, it's still cool in the region, with no warming trends observed. Hall will provide an update on Dworshak operations at next week's TMT meeting.

5. Lower Granite Guide Rail Repair

In response to feedback at the June 16 TMT meeting, the COE attempted to change the spill pattern in use since a tugboat collided with the guide rail, and found it wasn't feasible to change the spill pattern in bays 6-8 for a number of reasons. One reason is structural concerns about the temporary system that holds the guide rail in place. Another is the logistics of shutting off spill during lockup while making up that spill elsewhere across the spill bays – too difficult a process for lock operators to implement. So the COE decided to maintain the spill volume through bays 1-5 and shut off spill in bays 6-8.

Repairs began yesterday when divers inspected the cables attached to the anchor on the bottom of the guide wall. Today the COE began the process of installing the key back onto the guidewall. By the end of this week, spill is expected to resume and project operation return to normal. The COE does not

plan to pursue reimbursement from the tow company at this time for two reasons: (1) the COE had been notified of problems but hadn't yet taken action, and (2) the bolts were found to be rusty and needing maintenance. The current flow rate at Lower Granite is just a little under 200 kcfs. TMT members will be notified via email when operations there return to normal.

6. Summer 2010 Treaty Fishery

A treaty fishery SOR will be submitted to the COE tomorrow or Friday for treaty fishing next week, Tom Lorz (CRITFC) reported. Tonight the tribes will decide whether the fishery should continue for 1 or 2 weeks. Lorz noted that this year's sockeye run is amazingly high. Net flight results from last night's flight are not yet available.

7. Bonneville 2nd Powerhouse Unit Operations (SOR 2010-03)

The agreement reached at TMT last week was to return the Bonneville 2nd powerhouse units back to the normal operating range of 1% efficiency when descaling and mortality caused by high flows is under control. It looked like descaling and mortality rates were down for 1 day, then they rose again. So FPAC asked the COE to reduce flows and the COE implemented the request. The project will continue to operate as described in the SOR until inflows drop below 300 kcfs, predicted to be by the end of this week at the earliest.

Flows remain too high to implement the Bonneville spill test effectively. The COE will notify TMT via email when Bonneville operations return to normal and the spill test can begin. TMT will revisit Bonneville operations on its June 30 conference call.

8. Operations Review

Reservoirs. Grand Coulee is at 1,289.6 feet elevation and touched full on Monday, with inflows of 200 kcfs as of yesterday, June 22. Hungry Horse is at 3,557.37 feet elevation, with inflows of 13.3 kcfs and releasing 7 kcfs until the project is 2 ½ feet from full.

Libby is at elevation 2,425.43 feet with inflows of 34.6 kcfs, discharging 20 kcfs. Albeni Falls is at elevation 2,061.76 feet, with volatile inflows that are 70.7 kcfs at present. Outflows are 71.2 kcfs. Dworshak is at elevation 1,599.56 feet, passing inflows within the top half foot of full.

Lower Granite inflows are 112.8 kcfs. Its spring seasonal average objective was 85 kcfs, actual average releases were 78.1 kcfs. Priest Rapids is discharging 251.6 kcfs, with a seasonal discharge to date of 127.7 kcfs. McNary is discharging 343.3 kcfs, with a seasonal average of 215.5 kcfs. According to the latest projection, achieving the seasonal objective of 220 kcfs at McNary won't be a problem.

Fish. Adults: Sockeye have been passing Bonneville at the rate of 25,000 per day for the past 3 days, Wagner said. The seasonal count to date is a record-setting 134,000 sockeye. Shad counts are down, good news in terms of predation. At McNary the sockeye counts were 17,500 per day. Summer Chinook are passing at the rate of 3,500 per day, with a seasonal count of 53,000. Chinook are doing better than the 10-year average, but not hugely better like the 10-year average for sockeye. Yearling Chinook also are doing well. With less than 1,000 of them left at the lower river projects, it's clear that spring is over.

Juveniles: Subyearlings peaked a few weeks ago at 17,000 per day at Lower Granite, 26,000 per day at Little Goose, and 17,000 per day at Lower Monumental. Most of these are hatchery fish. Passage efficiency has been great with high flows occurring, so passage is 65% done, a little earlier than normal. Subyearling passage is peaking now at McNary. led to counts of 106,000 subyearlings per day passing Bonneville. A Ringold hatchery release of 5-8 million fish in the lower river means McNary numbers will rise, as will those at lower river projects over the next week. Yearling passage is pretty much done. Less than 1,000 steelhead per day are passing all projects except Lower Granite, where more steelhead keep coming thanks to high river flows.

Power. There was nothing to report today.

Water Quality. Laura Hamilton (COE) showed TMT the latest water quality information posted on the RCC web page, which is linked to the TMT page. TDG exceedances have occurred at McNary, Bonneville, Chief Joseph and Grand Coulee dams due to involuntary spill. Red figures indicate TDG exceedances of the Colville Tribe standard of 110%. One day it was looking possible to conduct the Bonneville spill test, but involuntary spill resumed the next day. The river is calming down as involuntary spill comes to an end.

9. Next Meeting

The next TMT meeting will be a conference call June 30, with Libby and Dworshak operations, summer treaty fishing, and an update on Bonneville operations on the agenda. The next TMT meeting in person is July 7.

Name	Affiliation
Rick Kruger	Oregon
Jim Litchfield	Montana
David Wills	USFWS
Steve Barton	COE
Tony Norris	BPA
Paul Wagner	NOAA
Rob Dies	Iberdrola Renewables
Laura Hamilton	COE

Phone:

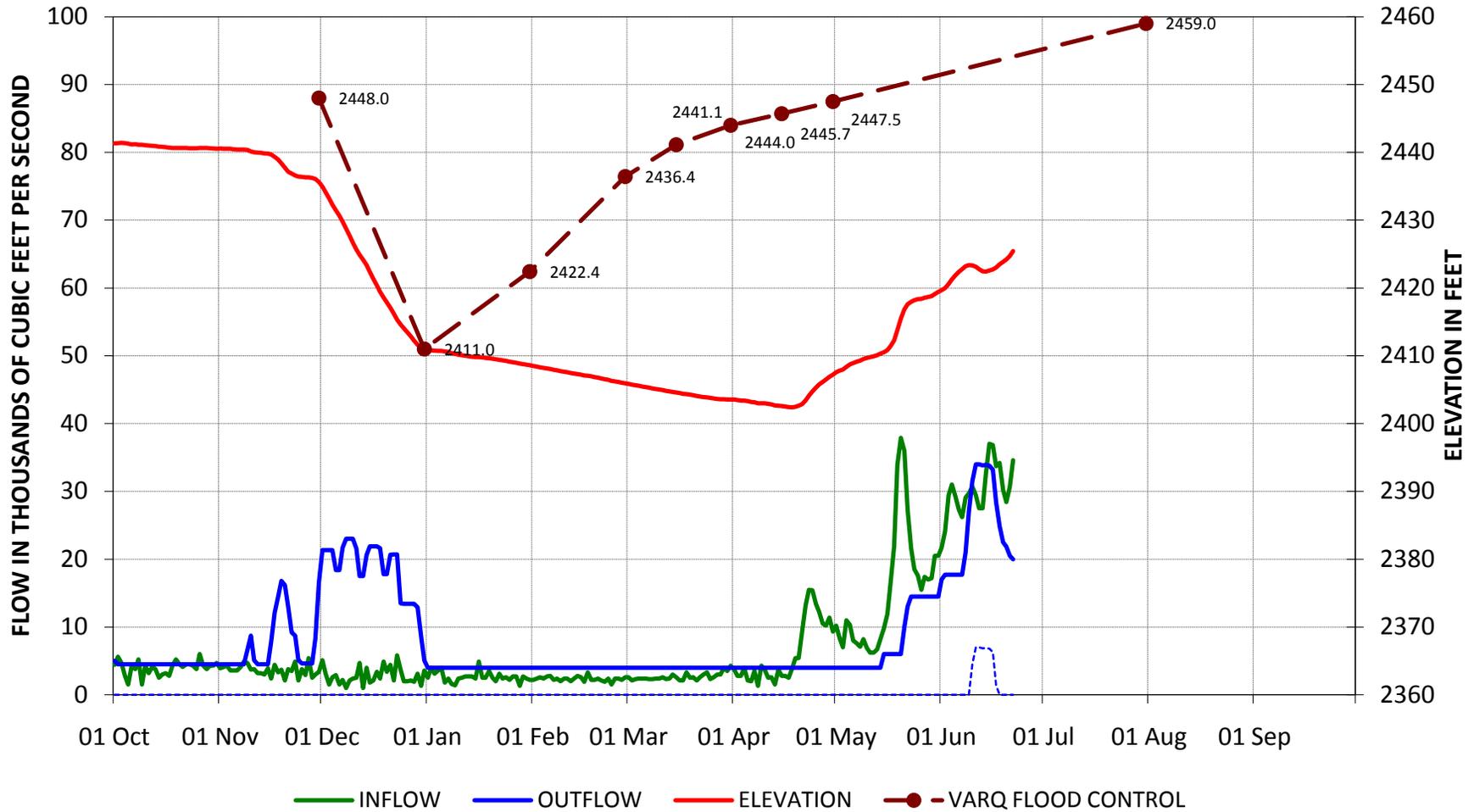
Mary Mellema	BOR
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Scott Bettin
Cindy LeFleur
Jeremy Giovando
Joel Fenolio
Greg Hoffman
John Hart
Glen Trager
Barry Espenson
Karl Kanbergs
Steve Hall
XX
Russ George
Dave Benner
Richelle Beck
Tom Lorz

BPA
Washington
COE Seattle
COE Seattle
COE Libby Dam
EWEB
Shell Energy
CBB
COE
COE Walla Walla
Seattle City Light
WMC
FPC
DRA
CRITFC

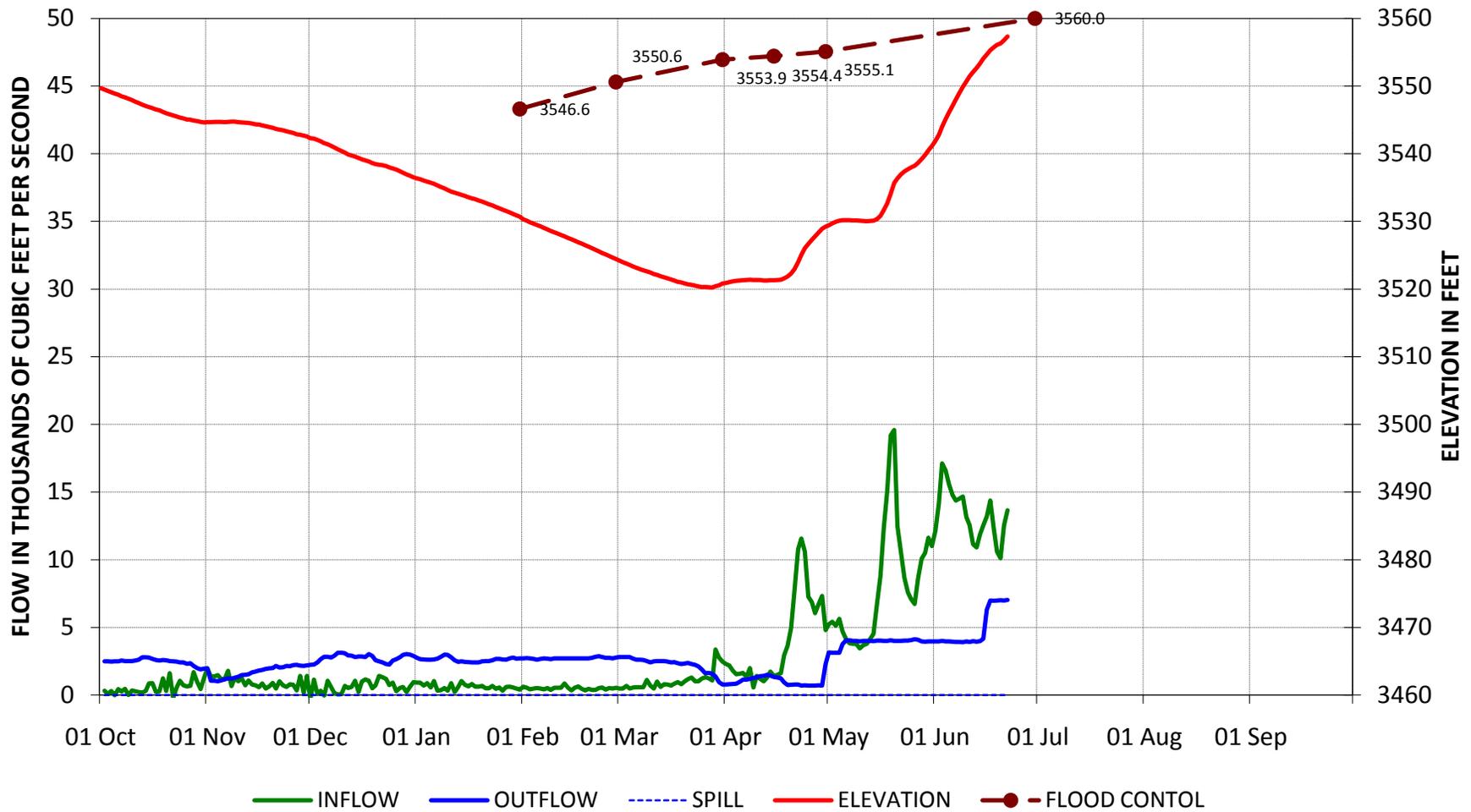
LIBBY DAM AND RESERVOIR

Water Year 2010



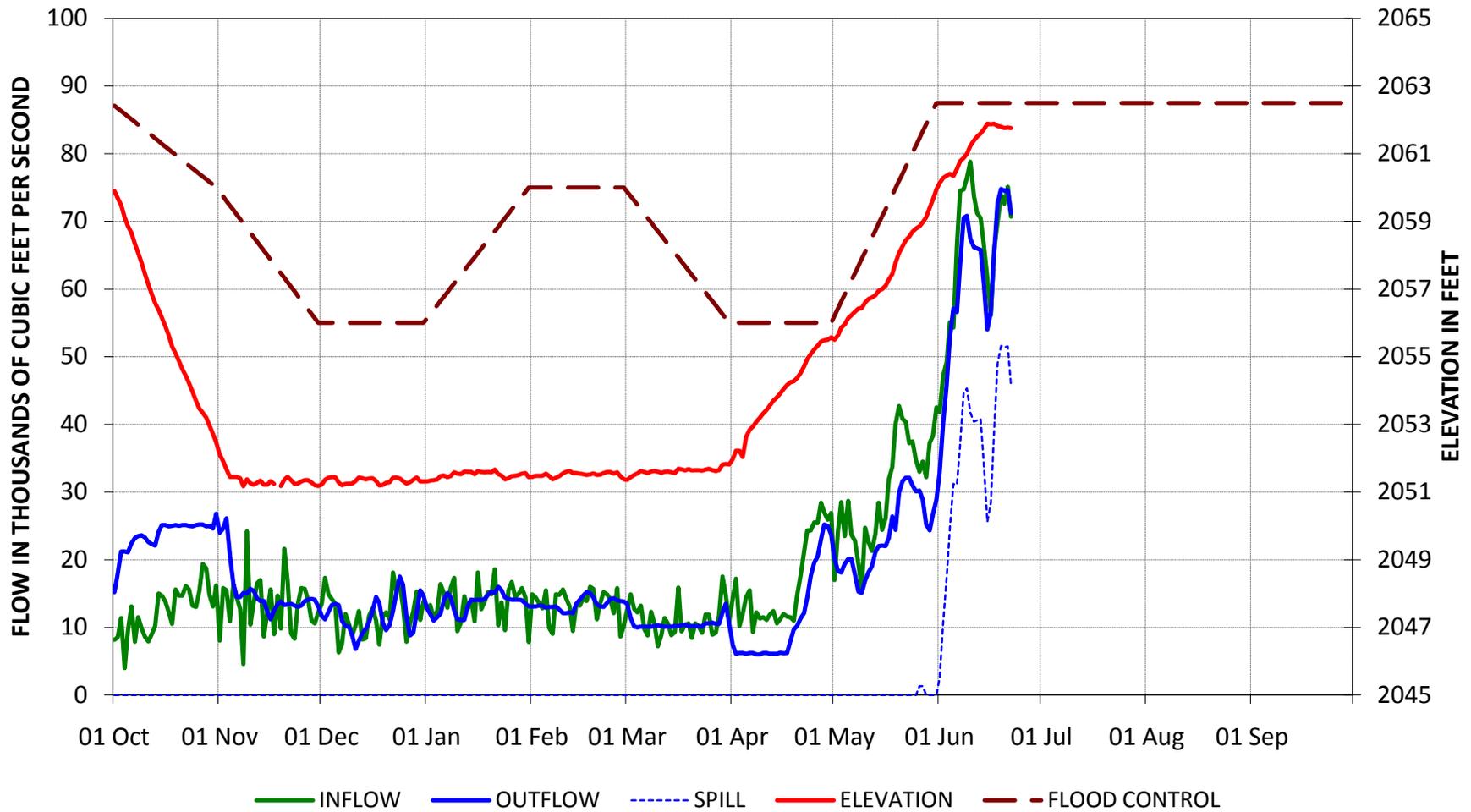
HUNGRY HORSE DAM AND RESERVOIR

Water Year 2010



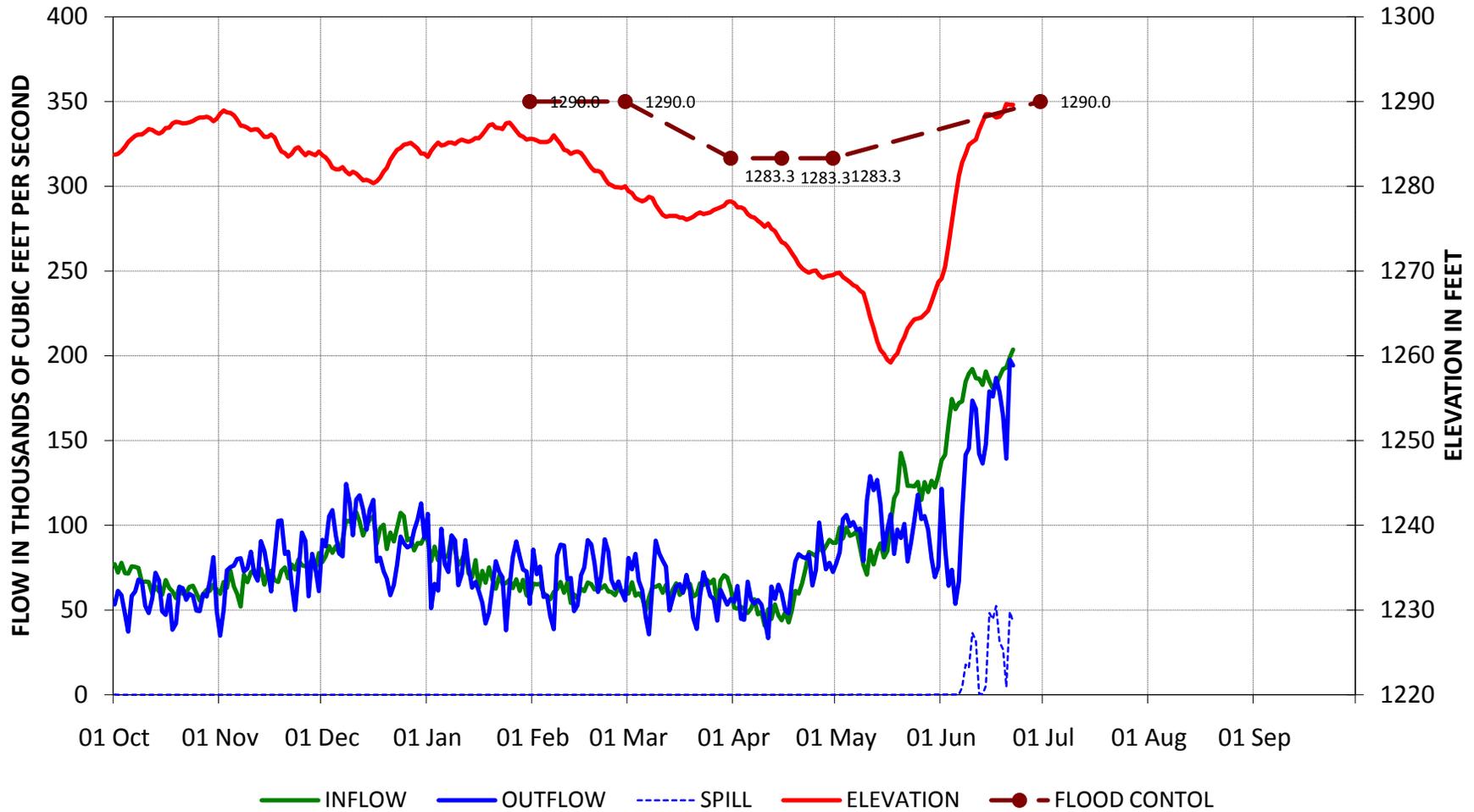
ALBENI FALLS DAM AND RESERVOIR

Water Year 2010



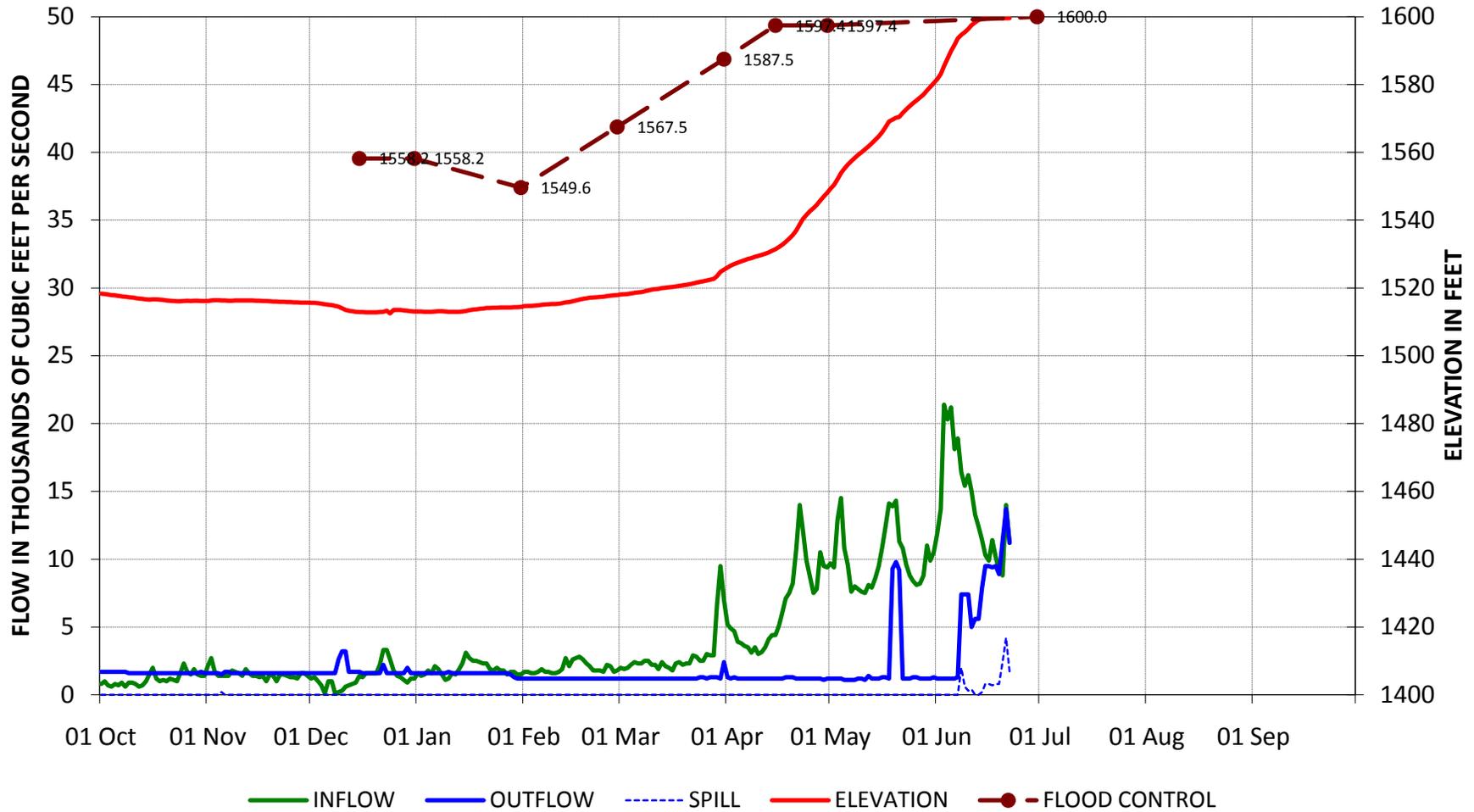
GRAND COULEE DAM AND RESERVOIR

Water Year 2010



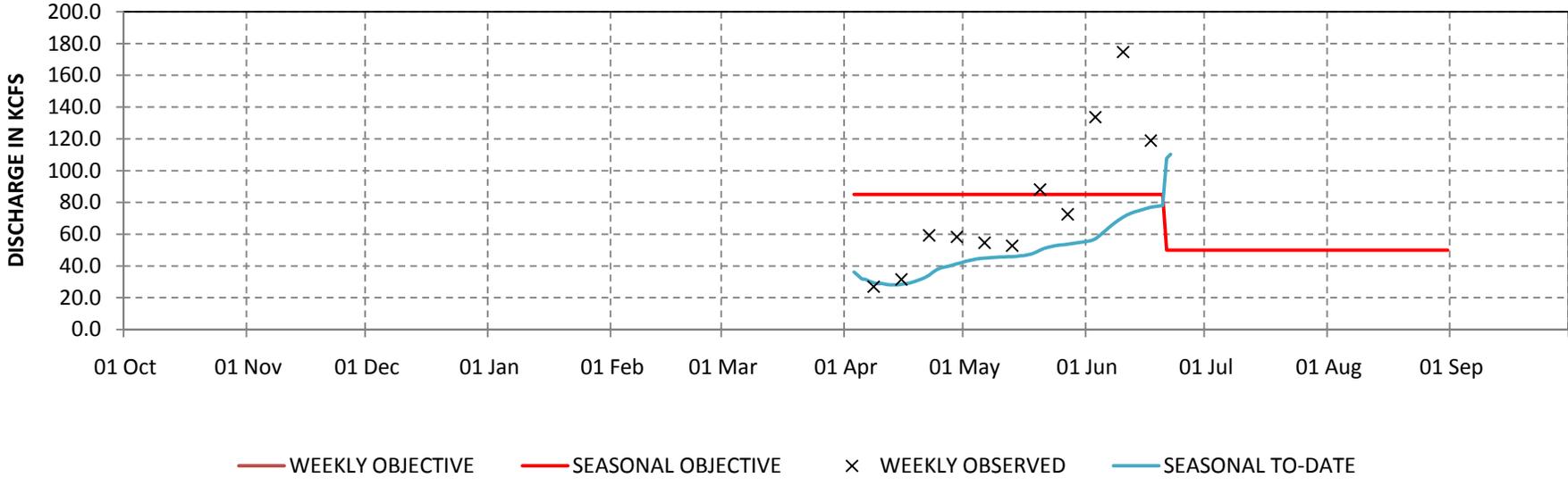
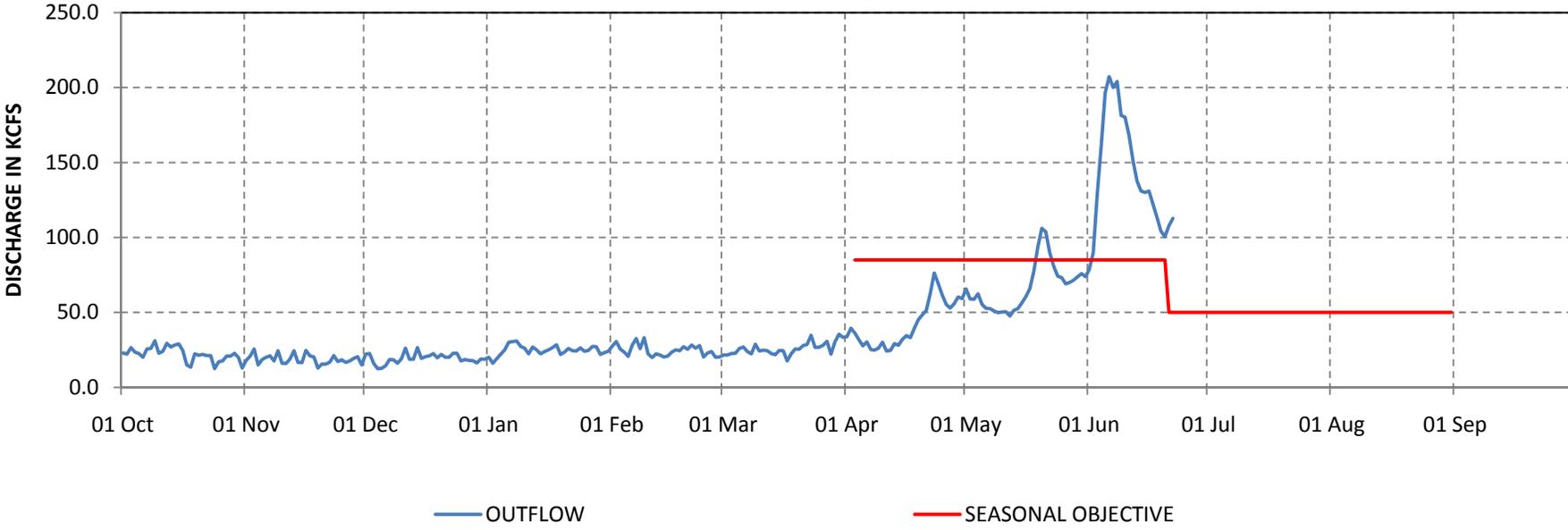
DWORSHAK DAM AND RESERVOIR

Water Year 2010

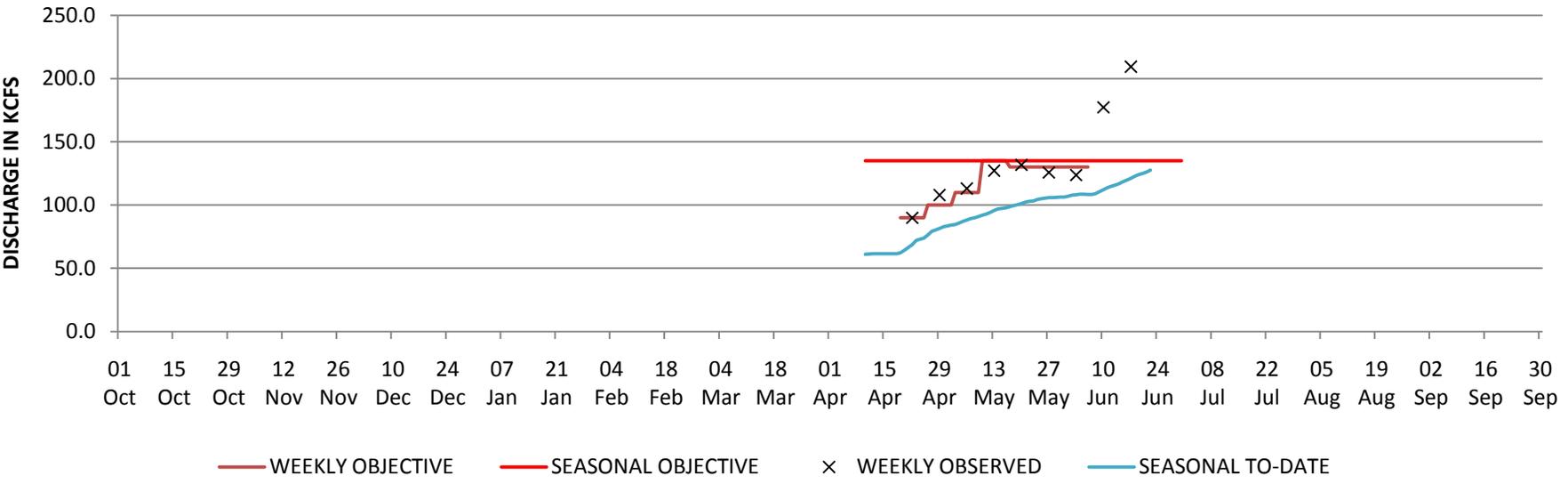
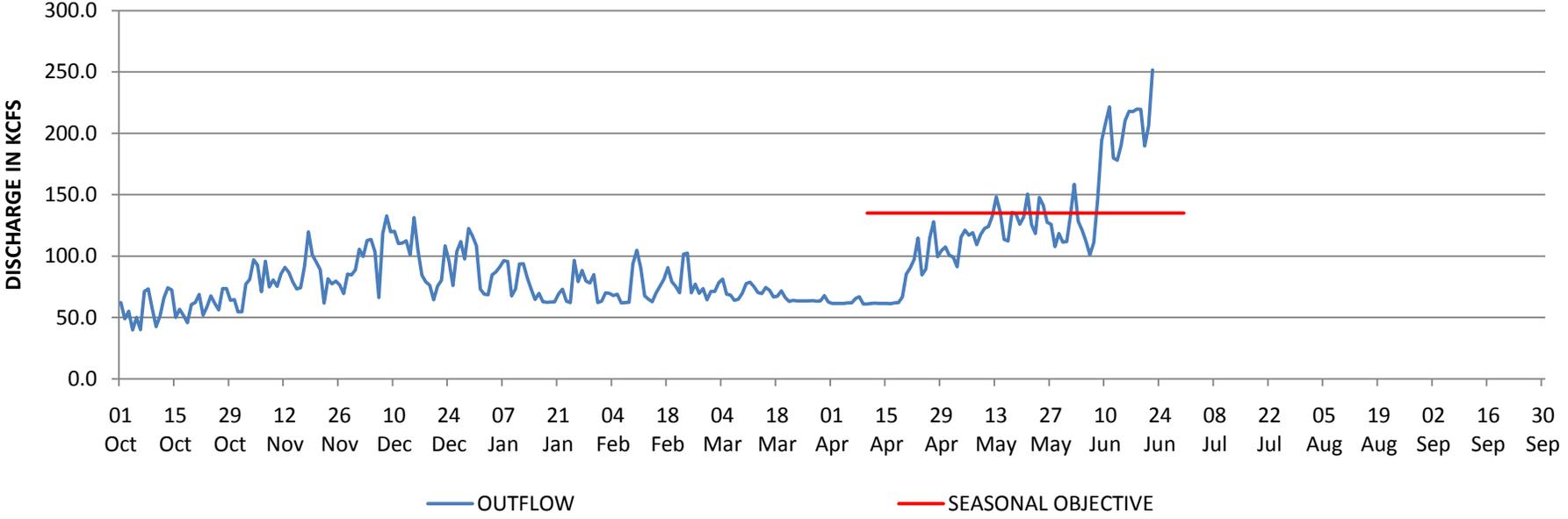


PROJECT DISCHARGE SUMMARY

SNAKE RIVER AT LOWER GRANITE DAM

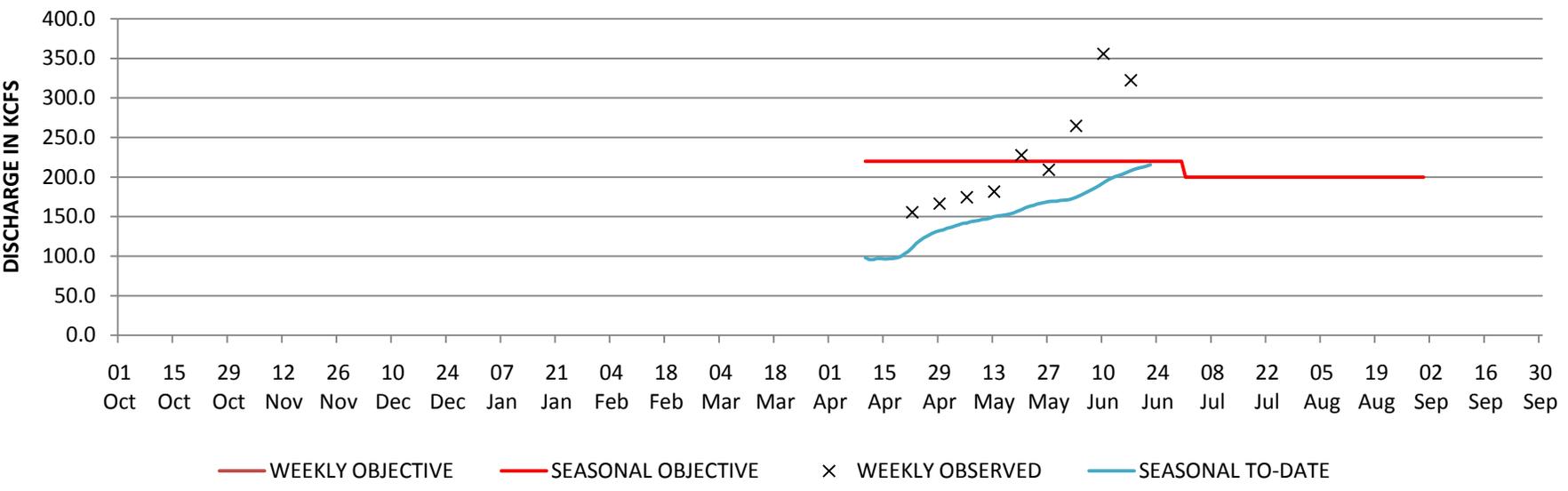
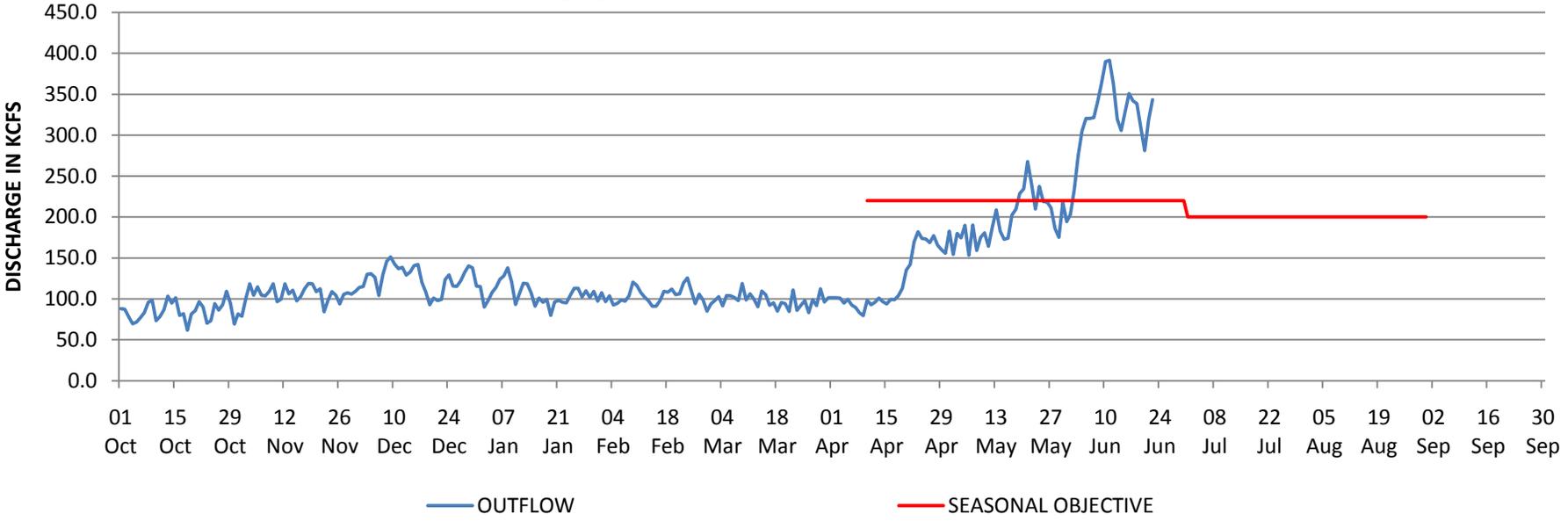


PROJECT DISCHARGE SUMMARY COLUMBIA RIVER AT PRIEST RAPIDS DAM

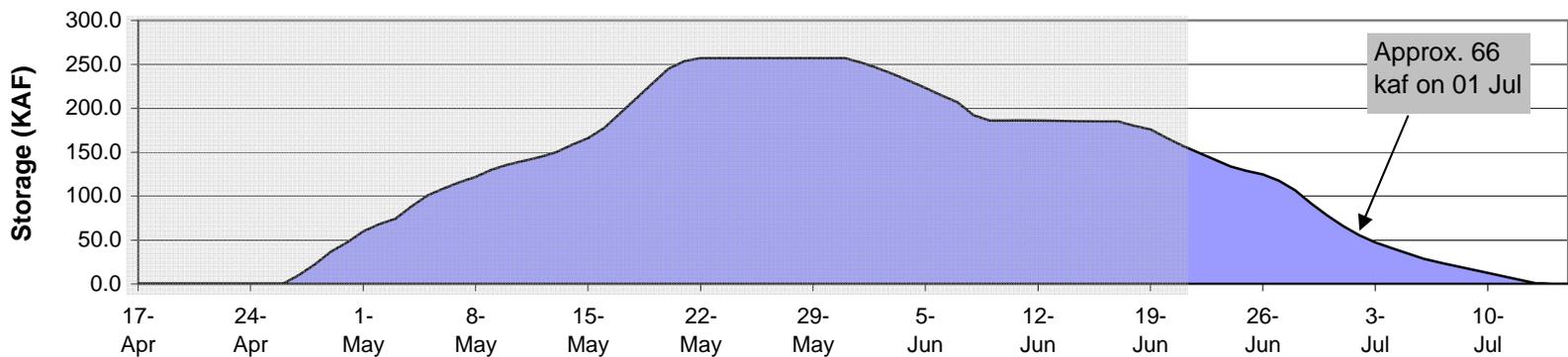


PROJECT DISCHARGE SUMMARY

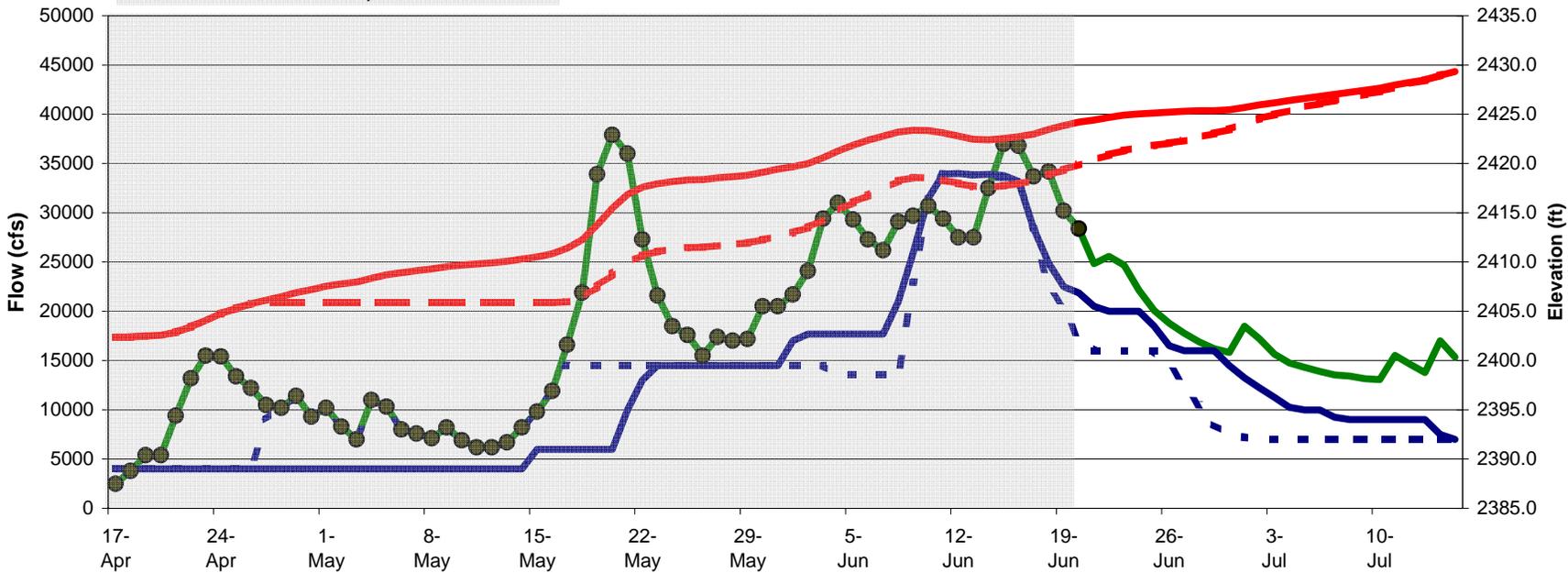
COLUMBIA RIVER AT McNARY DAM



Libby Dam Deviation Request Accounting

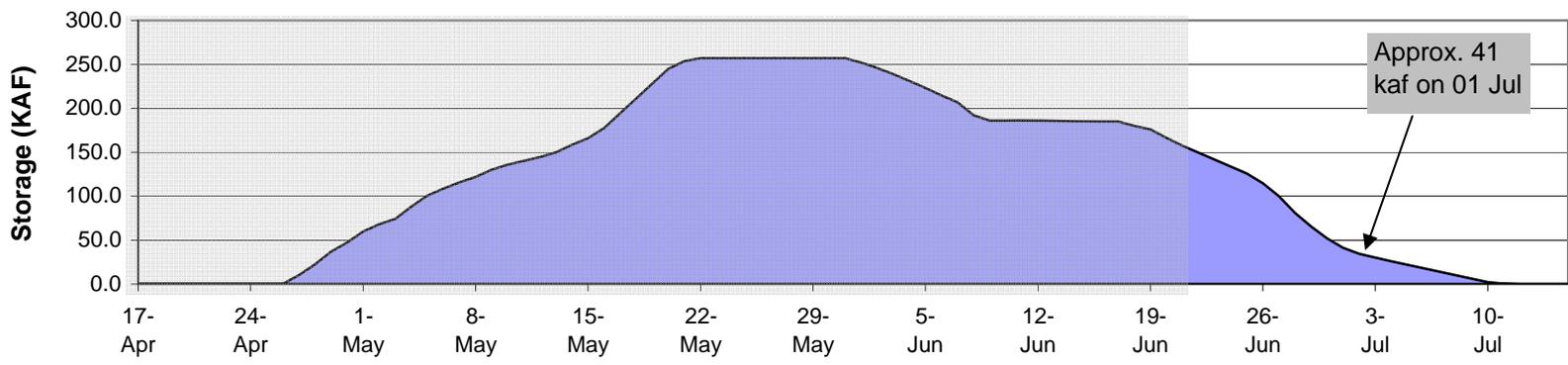


Shaded Area shows operations to date

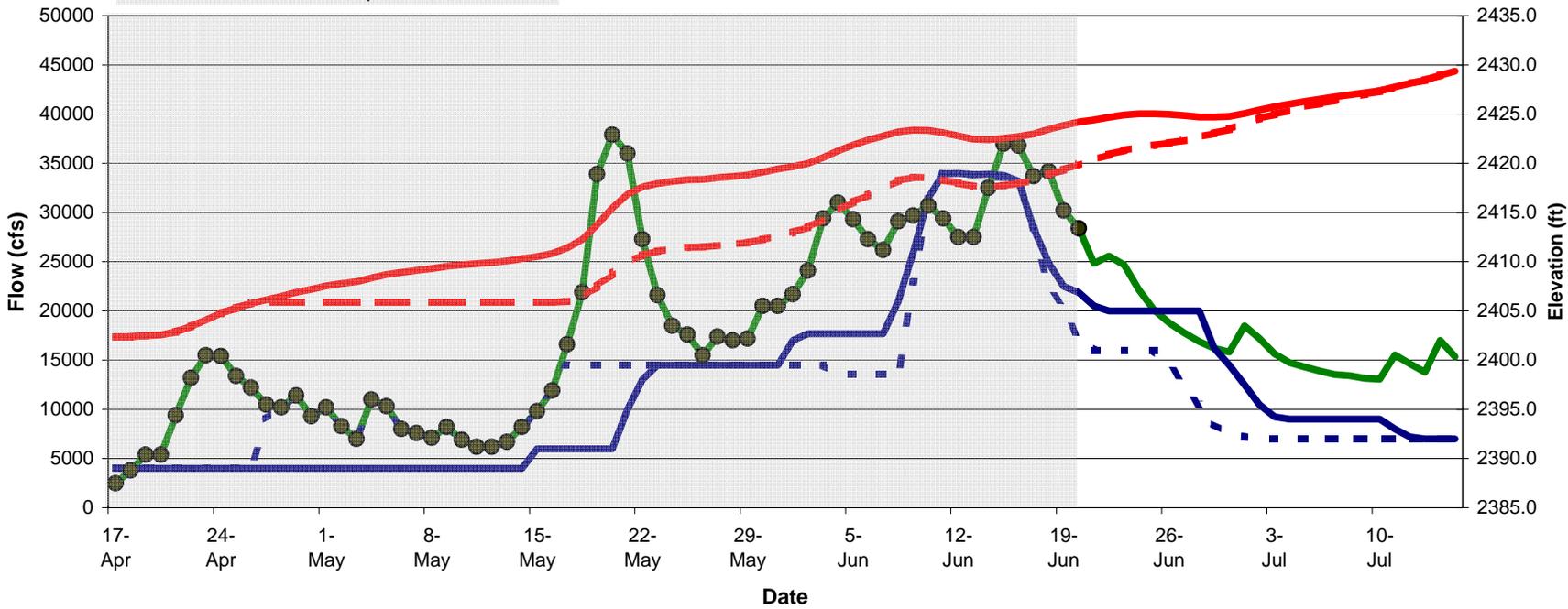


- Inflow
- - - VarQ Outflow
- Dev Outflow
- Obs Inflow
- - - VarQ Elevation
- Dev Elevation

Libby Dam Deviation Request Accounting



Shaded Area shows operations to date



—●— Inflow
 - - - VarQ Outflow
 — Dev Outflow
 ● Obs Inflow
 - - - VarQ Elevation
 — Dev Elevation

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
COE: Steve Barton / Karl Kanbergs / Doug Baus

TMT CONFERENCE CALL

Wednesday June 30, 2010 09:00 - 12:00

CONFERENCE PHONE LINE

Conference call line:877-807-5706; PASS CODE = 442788

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 Erin Halton with any issues or concerns they would like to see addressed.
Please e-mail her at ehalton@cnnw.net or call her at (503) 248-4703.*

AGENDA

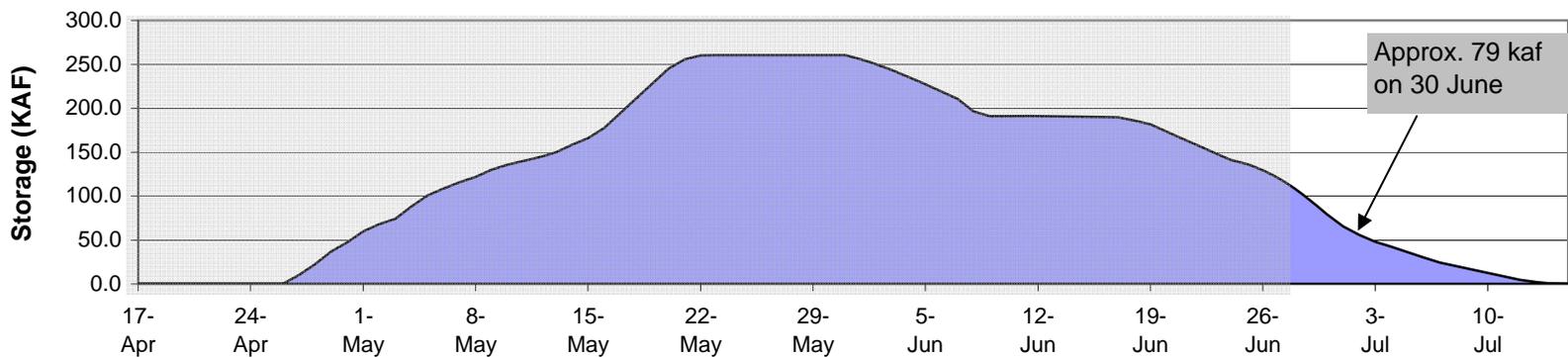
1. Welcome and Introductions
2. Treaty Fishing - Tom Lorz, CRITFC
 - a. [SOR 2010-C4 Summer Treaty Fishery](#)
3. Dworshak Operations/Temperature Modeling- Steve Hall, COE-NWW
 - a. [Water Temperature Comparisons](#)
4. Libby Operations - Steve Barton, COE-RCC
 - a. [Storage Accounting](#)
5. Bonneville Operation - Steve Barton, COE-RCC
6. Other
 - a. Set agenda and date for next meeting - **July 7, 2010**
 - b. [\[Calendar 2010\]](#)

Questions about the meeting may be referred to:

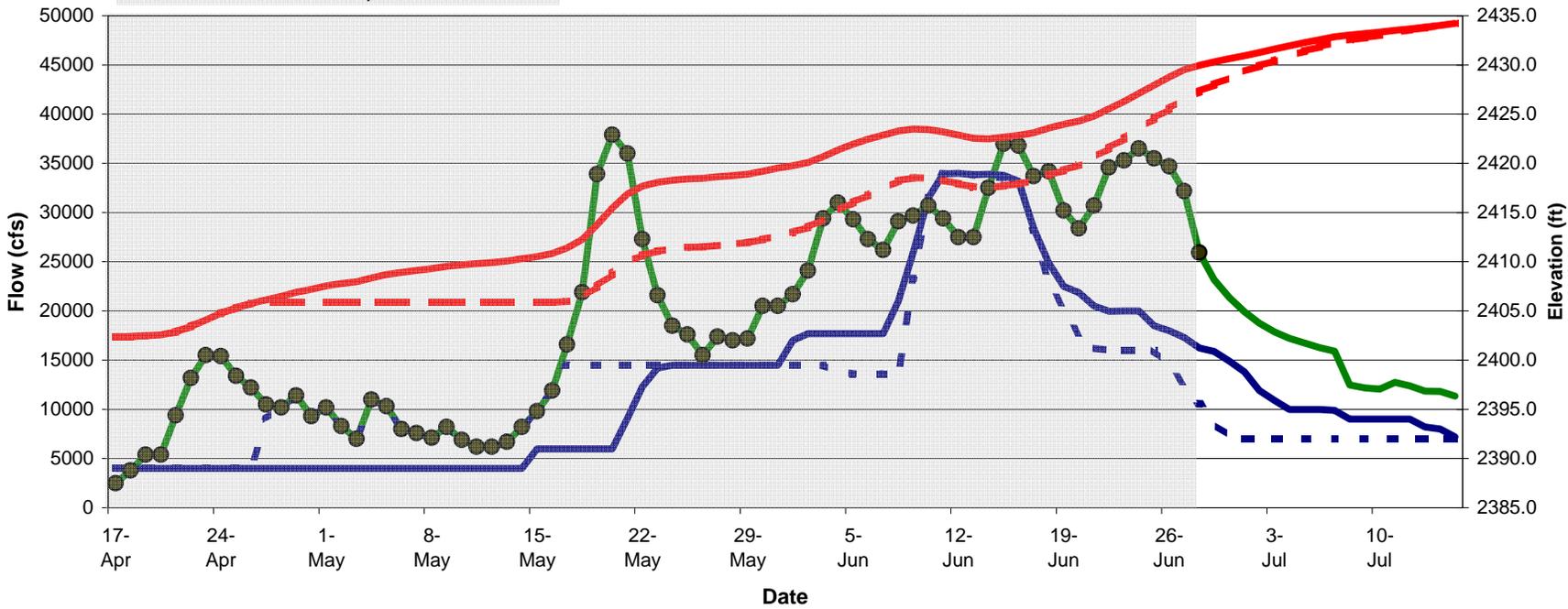
[Steve Barton](#) at (503) 808-3945, or

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

Libby Dam Deviation Request Accounting



Shaded Area shows operations to date



Legend: Inflow (green solid line), VarQ Outflow (blue dashed line), Dev Outflow (blue solid line), Obs Inflow (black dots), VarQ Elevation (red dashed line), Dev Elevation (red solid line)

COLUMBIA RIVER REGIONAL FORUM TECHNICAL MANAGEMENT TEAM

June 30, 2010

FACILITATOR'S SUMMARY NOTES

Facilitator/Notes: Erin Halton

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.

Treaty Fishing

Tom Lorz, CRITFC, referred TMT to SOR #2010-C4 posted as a link to the agenda. He noted that the SOR requested flow bands for Treaty Fishing for June 29-July 1st and July 6-8th. The COE responded that they would implement the SOR as written. Lorz said that counts for summer treaty fishing will be shared with the COE at an upcoming TMT meeting.

Dworshak Operations

Steve Barton, COE, referred TMT to a temperature modeling graph that was posted as a link to the agenda. The graph showed modeled and forecast temperatures for June 15 – July 13th and Barton noted that temperatures are expected to climb as the first full week of July unfolds. However, as there was not yet a need to call on the cool Dworshak storage water for temperature management, the COE suggested an operation of outflows at 4-4.5 kcfs through the 4th of July holiday weekend (passing inflows), then increase outflows to 7-7.5 kcfs on Tuesday July 6th. Barton added that water temperature modeling showed a climb to near 68°F for next week. Paul Wagner, on behalf of the Salmon Managers, reported that they had discussed this item at FPAC on 6/29; while the graph was not available for review during the FPAC meeting, Steve Hall, COE, had joined the meeting and described the COE’s proposal. Wagner stated that the Salmon Managers were amenable to the proposed operation, so long as outflows did not drop below 4 kcfs over the holiday weekend. Tom Lorz, CRITFC, relayed an inquiry from Dave Statler, Nez Perce Tribe: could the COE continue to pass inflows through July 11th? Dave Wills, USFWS, asked the COE if they could say what inflows were projected to be through next week, and the COE clarified that flows were expected to go from 5 kcfs on the 5th to 4 kcfs on the 6th and continue downward to 2-3 kcfs by July 11th.

Action/Next Steps: The Salmon Managers will relay the COE’s clarifying response to Statler’s question and the COE will operate Dworshak as described above. TMT members will discuss Dworshak operations at the 7/7 meeting.

Libby Operations

Steve Barton, COE, and Jeremy Giovando, COE Walla Walla, reported that flows were continuing to ramp down, with 10 kcfs flows this week and scheduled to drop to 9 kcfs next week. Giovando said that the Phase II storage release (about 80 KAF) was expected to be finished by 7/15. John Roache, Reclamation, added that Grand Coulee is near its

1289' elevation target and that flows at Grand Coulee and McNary are expected to drop noticeably over the next week or two.

Action/Next Steps: An update on Libby, including a sturgeon update, will be on the agenda for the 7/7 meeting.

Bonneville Powerhouse Operations

Steve Barton, COE, reported that the COE continued to use restricted operations at Bonneville PH2 to address descaling issues due to high flows/debris build up. Flows this week were in the 300-320 kcfs range and not yet “reliably” under 300 kcfs. Barton said that although the flows may drop below 300 kcfs over the holiday weekend, the COE proposed implementing the spill test on Tuesday 7/6, when there will be more certainty that the test can be sustained from a staffing, debris and flow management perspective. Salmon Managers present on the call (NOAA, ID, OR, USFWS, Umatilla Tribe/CRITFC) supported implementing the spill test on 7/6.

Action/Next Steps: TMT members will discuss this item at the 7/7 meeting.

Next TMT meeting: 7/7 face-to-face at 9:00 am

Agenda items will include:

- Treaty Fishing
- Dworshak Operations
- Libby Operations
- Bonneville Operations

Columbia River Regional Forum
TECHNICAL MANAGEMENT TEAM OFFICIAL MINUTES

June 30, 2010

Notes: Pat Vivian

1. Introduction

Today's TMT conference call was chaired by Steve Barton (COE) and facilitated by Erin Halton (DS Consulting). Representatives of the COE, Oregon, USFWS, BOR, Idaho, BPA, NOAA, 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. Treaty Fishing – SOR 2010-C4

On June 24, CRITFC submitted this SOR for a treaty fishery from June 29-July 1 and again from July 6-8. The SOR requests a 1.5-foot elevation band at Bonneville, John Day and The Dalles dams for the fishery, Tom Lorz reported.

The COE has reviewed the SOR and issued instructions to the project to implement the SOR as written, Barton said. Lorz expressed appreciation and will provide fish counts at TMT when the two fisheries are completed. There could be another tribal fishery in July.

3. Dworshak Operations and Temperature Modeling

Steve Hall (COE Walla Walla) presented water temperature modeling results for Dworshak, linked to today's agenda. The project is passing inflows and will continue to do so, targeting flows of 2,500-4,000 cfs over the 4th of July weekend. The plan is to increase Dworshak discharges to 7 kcfs on July 5 following the holiday, then shift to full powerhouse flows after that.

Temperatures are now around 60 degrees F and projected to climb steadily. As long as conditions remain cool, there's no need to draw flows from Dworshak reservoir. To conserve flows, the COE has been shaping outflows to when they're needed, while maintaining a seasonal flow average of approximately 11 kcfs for elevation requirements. As temperatures climb to the 65 degrees F mark during the second week of July, flows will increase to 7 kcfs as needed. The goal is to keep temperatures below 68 degrees F.

FPAC's discussions of this operation assumed that a floor of 4 kcfs outflows would be established over the 4th of July weekend, Wagner said. The plan for the second week of July was to increase outflows to 7-7.5 kcfs or whatever is efficient turbine loading at that point. Dave Statler (Nez Perce Tribe) was absent during the FPAC conversation, so Lorz will ask him whether he agrees with the Salmon Managers' plan. Statler told Lorz he wants the project to

pass inflows through July 11. Projected inflows through July 11 are 2-3 kcfs, maybe lower than that, Hall said.

In response to the Salmon Managers' proposal, the COE modeled flows of 4-4.5 kcfs over the 4th of July weekend, ramping up to 7.5 kcfs on July 5 as shown in the graph. The COE will implement this operation, pending discussion of any modifications the Nez Perce Tribe might request. The COE will also monitor water temperatures at Dworshak over the 4th of July weekend.

4. Libby Operations and Storage Accounting

The peak inflow trace at Libby is estimated as 30 kcfs, rather than 25 kcfs as shown in the attached graph, Barton said. Flows are slowly ramping down, with a shift of just under 80 kaf of storage into July as discussed at last week's TMT meeting. Coordination of Libby and Dworshak flows looks good according to the modeling. The project continues to ramp down slowly and will hold a rate of 10 kcfs for a few days, then drop to 9 kcfs, Jeremy Giovando (COE Seattle) said. That operation should conclude on July 15 when the project shifts to 7 kcfs minimum releases.

Due to staff absences, the update on actual sturgeon spawning at Libby was postponed until next week when spawning data will be available. The 80 kaf shift has been accomplished at Grand Coulee, John Roache (BOR) said. That puts the reservoir at 1,289 feet elevation. A drop in Grand Coulee discharges can be expected this weekend when the project transitions from spring to summer operations.

Flows at McNary have been around 300 kcfs but dropped to 200 kcfs this week and will continue to decline over the summer, Barton said. All the upstream projects are discharging less, Robyn MacKay (BPA) added. BPA hopes to keep Grand Coulee discharges above 100 kcfs through August. TMT will check in on Libby operations next week at the July 7 meeting.

5. Bonneville Operations

At the last TMT meeting, flows at Bonneville were above 300 kcfs, which is more spill than the 2010 spill test will allow. Subyearling Chinook passing the project at such high flows were experiencing severe descaling and mortality from accumulated debris, so the COE continued to implement the SOR while flows remain high.

Initially the COE planned to conduct the spill test over the 4th of July weekend, but with little staff available, there's concern about whether debris can be effectively managed. So project staff requested that TMT consider transitioning to the spill test on July 6, when flows are expected to drop below 300 kcfs. This plan allows enough time for the spill study to be statistically viable, while scheduling the test when staff are available to monitor debris after the turbines have been restored to their normal 1% operating range.

NOAA, Idaho, Oregon, USFWS and **CRITFC** representatives all endorsed this plan. The COE will implement the spill test accordingly. TMT will check in on Bonneville operations next week.

6. Next Meeting

The next TMT meeting will be in person July 7. Review of meeting notes and minutes, a treaty fishing update, Dworshak operations, sturgeon operations at Libby, and Bonneville operations will be on the agenda.

<i>Name</i>	<i>Affiliation</i>
Steve Barton	COE
Rick Kruger	Oregon
David Wills	USFWS
John Roache	BOR
Russ Kiefer	Idaho
Robyn MacKay	BPA
Glen Trager	Shell Energy
Tim Heizenrader	Centaurus
Jeremy Giovando	COE Seattle
Russ George	WMC
Doug Baus	COE
Rob Allerman	Deutsch Bank
Rob Dies	Iberdrola Renewables
Tom Le	Puget Sound Energy
Greg Lawson	Point Carbon
Ruth Burris	PGE
John Hart	EWEB
Eric Barker	Lewiston Tribune
Tom Lorz	CRITFC
Steve Hall	COE Walla Walla



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: 2010 C-4

TO: Brigadier General McMahon COE-NWD
James D. Barton COE-NWD-NP-Water Management
Steve Barton 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, Greg Delwiche 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 25, 2010

SUBJECT: **Operation of the Lower Columbia Pools for the Summer 2010 Treaty Fishery**

The Columbia River Inter-Tribal Fish Commission, on behalf of its members, the Nez Perce Tribe, the Confederated Tribes of the Umatilla Reservation, the Confederated Tribes of the Warm Springs Reservation, and the Yakama Nation, requests the following reservoir operations in "Zone 6" (Bonneville to McNary dams) during the 2010 summer Treaty fishery. This effort supports the 2010 summer ceremonial, subsistence, and commercial Treaty fishery times as established by the tribes and the Columbia River Compact.

SPECIFICATIONS: Implement the following pool operations as a hard system constraint, as follows:

June 29th, 2010, 6 am, Tuesday, through 6 pm, July 1st, 2010, Thursday.

July 6th, 2010, 6 am, Tuesday, through 6 pm, July 8th, 2010, 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.

At this time, we may have additional treaty fisheries in July. CRITFC will notify the Corps with specific times for the tribal fishery after each Compact hearing, via a new SOR.

JUSTIFICATION:

The 2010 summer treaty fishing season is of critical importance to CRITFC's member tribes. The escapement of an estimated **78,000** (Columbia at Bonneville Dam) adult summer Chinook (above normal rank) and **125,000** 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 in-river methods. This harvest will provide for the cultural, religious, and economic needs of the treaty tribes.

CRITFC will sponsor net flights each week, starting June 16, 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. The June 22nd, 2010 survey showed 258 nets in the Zone 6 pools, as follows: 115 (45%) in Bonneville, 43 (16%) in The Dalles, and 100 (39%) in John 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 1.5 foot or more 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. Thus, any delays or disruptions to their fishing operations caused by the pool fluctuations in Zone 6 can negatively impact tribal incomes, food resources, and cultural practices.

If this SOR cannot be accommodated, CRITFC requests a verbal response with an explanation from the federal operators by COB Friday, July 2, 2010. 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

**Water Temperature Comparisons
Model from 6/15/2010 to 7/13/2010
Observed Data to 6/29/2010**

