

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / Steve Kerns

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**8 January 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Chum Flow Alternatives
2. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - reservoir operation, power system, water supply forecast, (COE, BOR, BPA) [[Libby VarQ Press Release](#)] (17kB) 
3. Reschedule of Process Meeting
4. Review operations requests.
5. Develop recommended operations.
6. Other.
  - Set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*



**US Army Corps  
of Engineers**

Seattle District

*www.nws.usace.army.mil*

Public Affairs Office

PO Box 3755, Seattle, WA 98124

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## News Release

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### **Interim implementation of VARQ alternative flood control plan begins in 2003 at Libby Dam**

**FOR IMMEDIATE RELEASE**

**Contact: STEVEN COSGROVE, (206) 764-3750**

**U.S. Army Corps of Engineers**

**December 31, 2002**

SEATTLE - The U.S. Army Corps of Engineers' (Corps) Northwestern Division office today announced its decision to implement the VARQ alternative flood control plan operation on an interim basis in 2003 at Libby Dam on the Kootenai River in Montana. The operation is intended to improve the ability to provide spring and summer flows to benefit threatened and endangered Kootenai River white sturgeon, Columbia basin bull trout, and salmon and steelhead in the Columbia. Basically, VARQ FC would result in reduced releases from Libby and Hungry Horse dams in Montana during the winter drawdown period of January through April in most years (depending on forecasted water supply), providing better assurance of reservoir refill in the summer. This is accomplished by reducing flood control storage requirements in some water runoff forecast conditions. .

The decision on interim implementation of VARQ FC reflects full consideration of many factors, including Endangered Species Act compliance, potential environmental and economic effects, Tribal trust responsibilities, the Columbia River Treaty, and agency and public comments. The environmental and economic effects of interim implementation of VARQ were addressed in an Environmental Assessment (EA) prepared by the Seattle District Corps of Engineers. A Finding of No Significant Impact was signed for this action on 31 December 2002.

Today's decision to implement VARQ flood control at Libby Dam will take effect immediately and will remain in place until completion of an environmental impact statement (EIS) on potential longer-term implementation of VARQ flood control at both Libby and Hungry Horse dams. Hungry Horse Dam, which is operated by the Bureau of Reclamation, began interim implementation of VARQ flood control in 2002. The Corps is working with the Bureau

of Reclamation to complete the EIS by late 2004. VARQ implementation at Libby and Hungry Horse dams is an action required to meet the Corps' and Reclamation's responsibilities under the Endangered Species Act as described in the Biological Opinions of December 2000 concerning operation of Federal Columbia River Power System dams, from the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

The Environmental Assessment and the Finding of No Significant Impact for interim implementation of VARQ will be posted on the Corps' project web site at [http://www.nws.usace.army.mil/ers/varq\\_web.htm](http://www.nws.usace.army.mil/ers/varq_web.htm) by January 3, 2003.

Questions may be directed to the Corps of Engineers' Seattle District Public Affairs Office at (206) 764-3750.

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# COLUMBIA RIVER REGIONAL FORUM

## TECHNICAL MANAGEMENT TEAM CONFERENCE CALL NOTES

January 8, 2003

CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM  
HOUSE  
PORTLAND, OREGON

**TMT Internet Homepage:** <http://www.nwd-wc.usace.army.mil/TMT/index.html>

### FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Donna Silverberg

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

#### **Chum Flow Alternatives:**

##### *Action Agency Scenarios:*

Tony Norris, BOR, presented information on flow studies being done by the Action Agencies to help with 2003 chum decisions. The four scenarios are:

1. Priority: Meet chum needs – miss Vernita Bar? Miss April 10 refill?
2. Priority: Meet Vernita Bar – dewater chum? Miss April 10 refill?
3. Priority: Meet April 10 refill – dewater chum? Miss Vernita Bar?
4. Priority: Meet chum needs and Vernita Bar – how far is Grand Coulee drafted?  
How are May/June flows affected?

The January final runoff forecast will be used in the models. 125 kcfs will be used for chum criteria. The COE will run a Q adjust run to meet April 10 refill and Vernita Bar. This will be available at the next TMT meeting, January 22. Shane Scott, Washington, will check on chum emergence dates.

##### *Hydro 51 and 52 Studies:*

The Salmon Managers reached consensus that hydro study 52 is not a long term preference because it would change the Biological Opinion priority of the April 10 refill and reduce spring flows too significantly during key steelhead and spring chinook migration and low flow years. During average and high flow years, there is no real affect. Paul Wagner thanked BPA for conducting the analysis.

#### **Review Current System Conditions:**

*Fish:* Paul Wagner reported that there were very high numbers of chum spawning in the lower Columbia. The final count will be available at the next TMT meeting.

*Reservoir Operations:* Rudd Turner reported that COE projects are being operated at a minimum discharge. BON is at an elevation 11.3-1.5' operating range due to the end of chum spawning. Tony Norris reported that Libby is operating with VARQ as the minimum elevation. Information on VARQ in Libby forecasts will be posted on the TMT home page.

*Water Supply:* The January early bird forecast showed a below normal forecast for water supply and precipitation. The January final was due out on Jan. 9.

**Reschedule Process Meeting:**

The January 22 meeting on process has been changed to the afternoon of January 15. Donna Silverberg will send an email out to members with further details.

**Other:**

At an FPAC meeting, the Salmon Managers determined that they were not comfortable with the tailwater at Bonneville going below 11.5' at this time, but that the issue should be revisited after further field work is done and the location of the chum redds is verified.

**Next Meeting, January 22:**

Agenda Items:

- Action Agencies Chum Scenarios
- Steve Smith – NMFS Science Center in-stream survival study for 2002
- Chris Perry – University of Idaho study on tagged fish movements
- Harold Opitz – RFC's new forecasting method, STP
- Review Current System Conditions
- Review SOR's
- Develop Recommended Operations

## **Meeting Minutes**

### ***1. Greeting and Introductions***

The January 7 Technical Management Team conference call was chaired by Rudd Turner of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Rudd Turner at 503/808-3935.

### ***2. Chum Flow Alternatives.***

There are two main components to this agenda item, said Scott Bettin -- the biological implications of study alternatives 51 and 52, and a presentation on this year's operation, said Scott Bettin. Tony Norris said the action agencies have been modeling the

chum operation in light of the current system forecast; we're studying four different possibilities, he said, to see what the likelihood is that these four outcomes may occur. There are essentially four questions we're going to study for the hydrosystem, to see what we'll get, given the current outlook, Norris said -- the goal is to give the salmon managers some decisions to make, based on what we know now. He characterized the four study alternatives (and their associated key questions) as follows:

- Alternative 1: do not dewater chum. How does this operation impact Vernita Bar or April 10 refill?
- Alternative 2: Vernita Bar is the priority. Does it dewater chum, and where do we end up on April 10 refill?
- Alternative 3: April 10 refill is the priority. Does it dewater chum, and does it impact the Vernita Bar operation?
- Alternative 4: meet chum flows, meet Vernita Bar targets. How far does that draft Grand Coulee, and how does that affect May-June flows at Priest Rapids and McNary?

The January final water supply forecast is due out tomorrow, Norris added, and at that point, we'll start modeling. The assumption, to provide the chum flow, is that we will meet a minimum Bonneville outflow of 125 Kcfs. We'll discuss the outcome of this exercise at the next TMT meeting on January 22, he said.

With respect to the biological impacts of study alternatives 51 and 52, the consensus among the salmon managers, given the type of water year this is shaping up to be, was to maintain April 10 refill as the top priority, said Paul Wagner. Given the condition of the listed stocks and the current water supply forecast, we recommend against Alternatives 52 and 51, he said, because of the anticipated reduction in spring flows.

### ***3. Fish Migration Status.***

Wagner characterized the 2002 Lower Columbia chum migration as "tremendous." The total for tributaries and mainstem was about 30,000 this year, said Shane Scott. David Wills added that, in the tributaries, it was a very good year, although not quite as good as last year, mainly because water levels didn't allow full access to the tributaries. Wills said he will try to have a final peak tributary population count by the next TMT meeting.

### ***4. Reservoir Operations, Power System Status, Water Supply Forecast.***

Turner said all storage projects are on minimum discharge; average outflow at Bonneville was 117 Kcfs. The minimum tailwater elevation at that project is 11.3 feet, with 11.5 feet as the target, given that chum spawning has now officially ended. Average Lower Granite discharge was 19.5 Kcfs yesterday. Dworshak is currently at 1517.9 feet and filling slightly; that project is also on minimum discharge. The Corps plans to continue that operation through January and possibly through February, he said. Libby is now at elevation 2410.5, and is drafting about a tenth of a foot per day. We're releasing 4 Kcfs, minimum discharge at that project, and plan to hold that through January and possibly through February as well, Turner said. Albeni Falls is at 2055.4 feet, releasing

just over 9 Kcfs, he said. Hungry Horse is at 3518 feet and drafting to meet the Columbia Falls minimum, said Norris; the current runoff forecast is 85% of normal for that basin. The Columbia Falls minimum is now 3.484 Kcfs. Norris added that Grand Coulee was at elevation 1288 this morning.

Have the salmon managers discussed the possibility of lowering the Bonneville tailwater elevation, now that chum spawning has officially ended? Bettin asked. We talked about it at yesterday's FPAC meeting, but we're not comfortable with lowering it at this time, Wills replied. Just checking to see if it's still on your radar, Bettin said. The rationale was that, although field crews haven't documented a lot of redds at the highest elevations, flows were high during the latter part of December, and we want to give the benefit of the doubt to chum, added Scott. We're not ready to lower the Bonneville tailwater elevation until we have a bit more forecast information, so that we can assess the likelihood of being able to maintain the current flow level with a bit more confidence, said Wagner. Another participant noted that the current GPS coordinates of the redds aren't detailed enough to say, with any confidence, how many redds would be dewatered if the Bonneville tailwater is lowered; field crews will be working to firm up those GPS coordinates over the coming weeks.

Turner added that, based on the below-average forecast at Libby, there is no difference between the VARQ and normal flood control elevations. Chris Ross said that based on his calculations, the difference is nearly 12 feet. My point was that, due to the below average water supply forecast, from an operational standpoint, whether or not we implement VARQ, it won't change the operation much at Libby, Turner said – the Corps is likely to release minimum discharge from Libby at least through February.

With respect to the power system, Bettin said everything is fine. Moving on to the water supply forecast, Turner said the most recent forecast is 80 MAF at The Dalles, January-July, 75% of average. At Lower Granite, the current April-July forecast is 15.4 MAF, 71% of average; at Grand Coulee, April-July, 50.5 MAF, 80% of average. The most recent Corps forecast shows Dworshak's April-July runoff volume at 1.784 MAF, 67% of normal. Libby's April-September forecast volume is now 5.25 MAF, 79% of normal, according to the River Forecast Center; the Corps is working on its forecast, but I expect our numbers to be very similar, Turner said. Precipitation was running in the 50-60% of normal range in most basins through December 31, he added, although there have been some significant precipitation events since then.

### ***5. Reschedule Process Review Meeting.***

We would like to delay the process review meeting to the afternoon following our February 5 meeting, said Silverberg. At Scott's request, the TMT process review was rescheduled for next Wednesday afternoon, January 15.

**6. Recommended Operations.**

The current tailwater elevation (11.5 soft constraint, 11.3 hard constraint) will continue at Bonneville, Turner said; Dworshak and Libby will continue to release minimum discharge. Wagner noted that, at the next meeting, the NMFS Science Center will provide a presentation on in-stream juvenile fish survival. Turner added that, at that meeting, Chris Perry from the University of Idaho will provide a presentation on adult fish movement. Also at that meeting, Harold Opitz would like to discuss the River Forecast Center's Single Trace Procedure (STP) modeling process that is replacing SSARR, Turner said.

**7. Next TMT Meeting Date.**

The next meeting of the Technical Management Team (the TMT process review meeting) was set for Wednesday, January 15. The next regularly-scheduled TMT meeting was set for January 22. Meeting summary prepared by Jeff Kuechle, BPA contractor.

**TMT ATTENDANCE LIST  
January 8, 2002**

<b>Name</b>	<b>Affiliation</b>
Donna Silverberg	Facilitation Team
Rudd Turner	COE
Scott Bettin	BPA
Shane Scott	WDFW
Paul Wagner	NOAA Fisheries
Tony Norris	USBR
Scott Boyd	COE
Cindy Henriksen	COE
Mike O'Bryant	Columbia Basin Bulletin
Steve Pettit	IDFG
David Wills	USFWS
Steven Wallace	PacifiCorp
Chris Ross	NOAA Fisheries
Martin Hatchett	Seattle City Light
Jiong Ji	Avista Energy

Kyle Martin	CRITFC
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## TMT MEETING

22 January 2003      0900 - 1200 hours

Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190

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## AGENDA

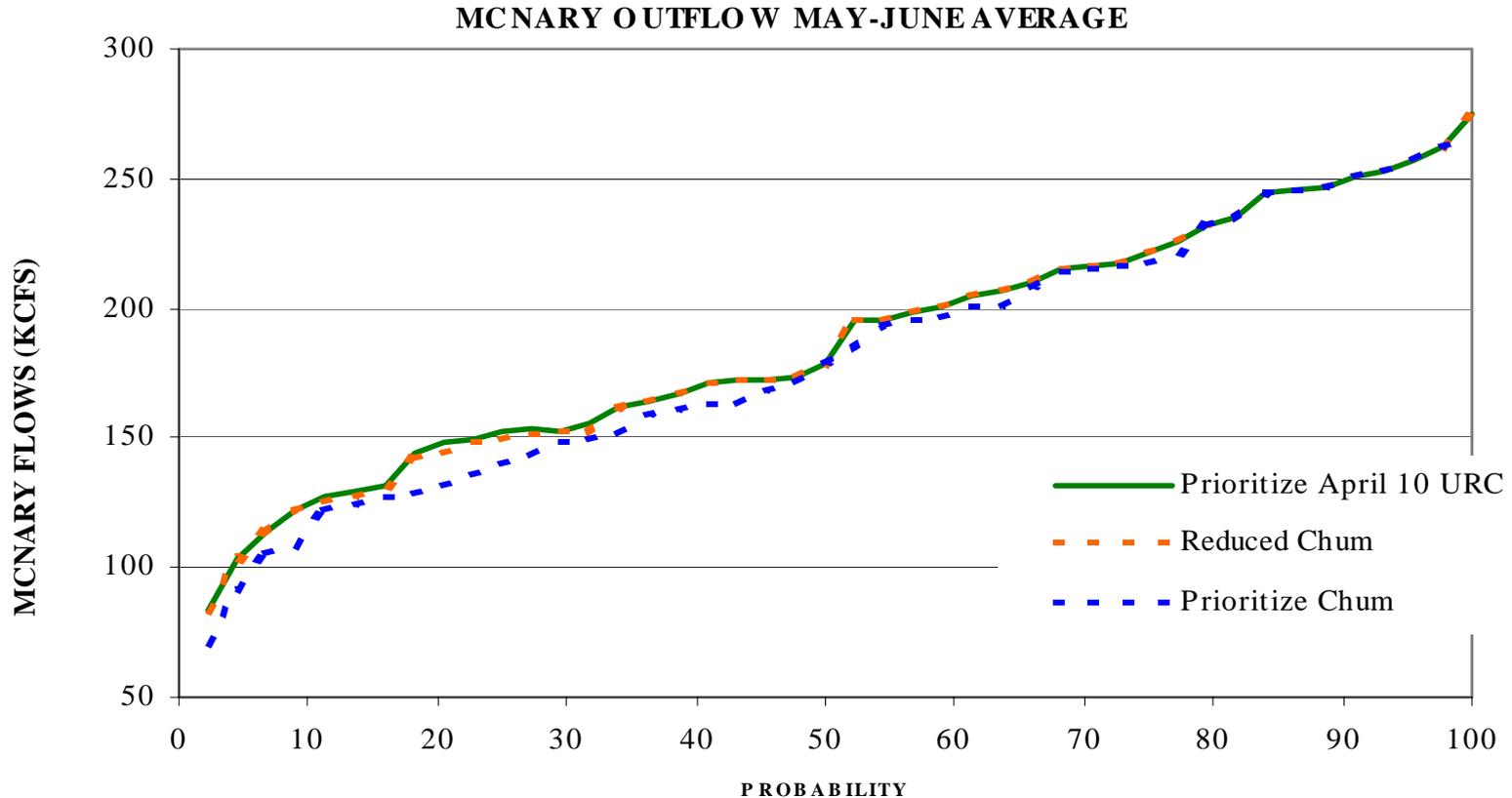
1. Predicting streamflows with the Single Trace Procedure, STP (RFC).
2. Instream juvenile fish survival, 2002 study (NMFS). [\[NMFS Study\]](#) (785kB) 
3. Lower Snake adult fish migrations, Dworshak operations (University of Idaho). [\[Presentation\]](#) (82kB) 
4. Chum flow scenarios, modeling results (BPA, COE, BOR).  
[\[WDFW Chum Surveys\]](#) (1.1MB)   
[\[BPA Chum\]](#) (31kB)   
[\[COE QADJ Results\]](#) (39kB) 
5. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - reservoir operation, power system, water supply forecast, (COE, BOR, BPA)
6. Review operations requests.
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# Assumptions (BPA 1/22/03)

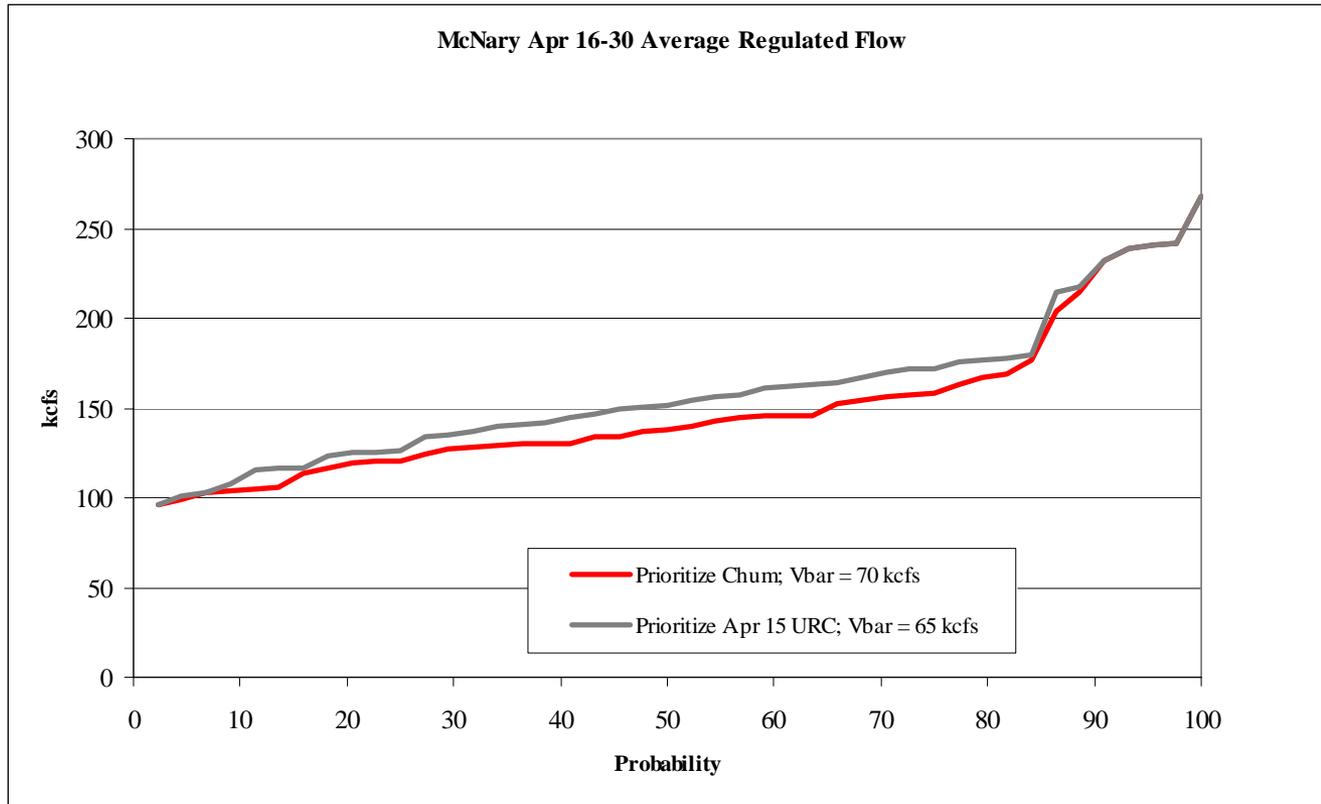
- 44 ESP streamflows with a mean of 79 Maf and a 95% confidence range of 60-101 Maf
- GCL refill on June 30 takes precedence over May-June flow target at McNary
- GCL initialized to 1283' on February 1
- 90% probability of GCL April 15 FCE = 1283.3'

# Spring Flow Implications



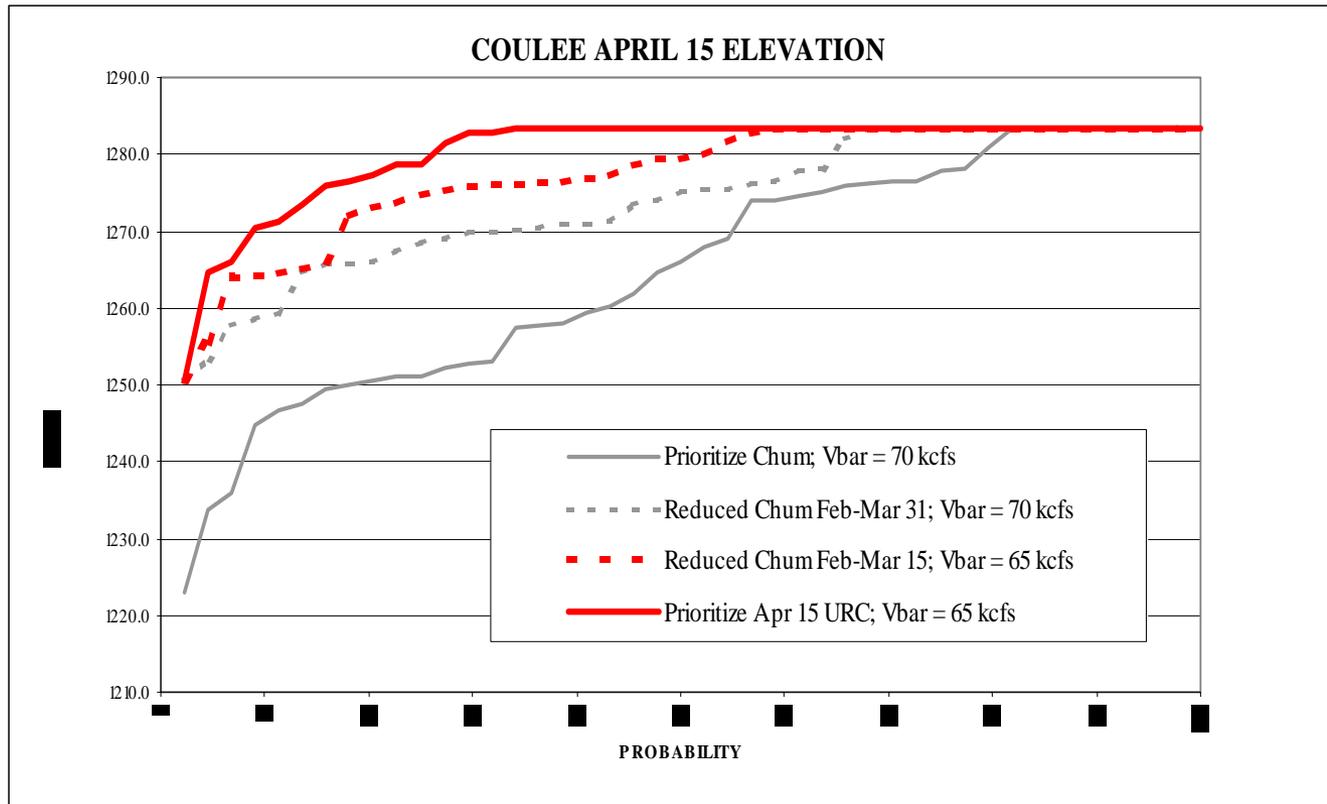
- Prioritize April 15: Abandon chum flows Feb 1, Vernita Bar = 65 kcfs
- Reduced Chum (3/15): Chum = 115 kcfs February – March 15, Vernita Bar = 65 kcfs
- Prioritize Chum: Chum = 125 kcfs February and March, Vernita Bar = 70 kcfs

# Spring Flow Implications



- Prioritize April 15: Abandon chum flows Feb 1, Vernita Bar = 65 kcfs
- Prioritize Chum: Chum = 125 kcfs February and March, Vernita Bar = 70 kcfs

# April 15 Refill Implications



- Prioritize April 15: Abandon chum flows Feb 1, Vernita Bar = 65 kcfs
- Reduced Chum (3/15): Chum = 115 kcfs February – March 15, Vernita Bar = 65 kcfs
- Reduced Chum (3/31): Chum = 115 kcfs February – March 31, Vernita Bar = 70 kcfs
- Prioritize Chum: Chum = 125 kcfs February and March, Vernita Bar = 70 kcfs

# April 15 Refill Implications

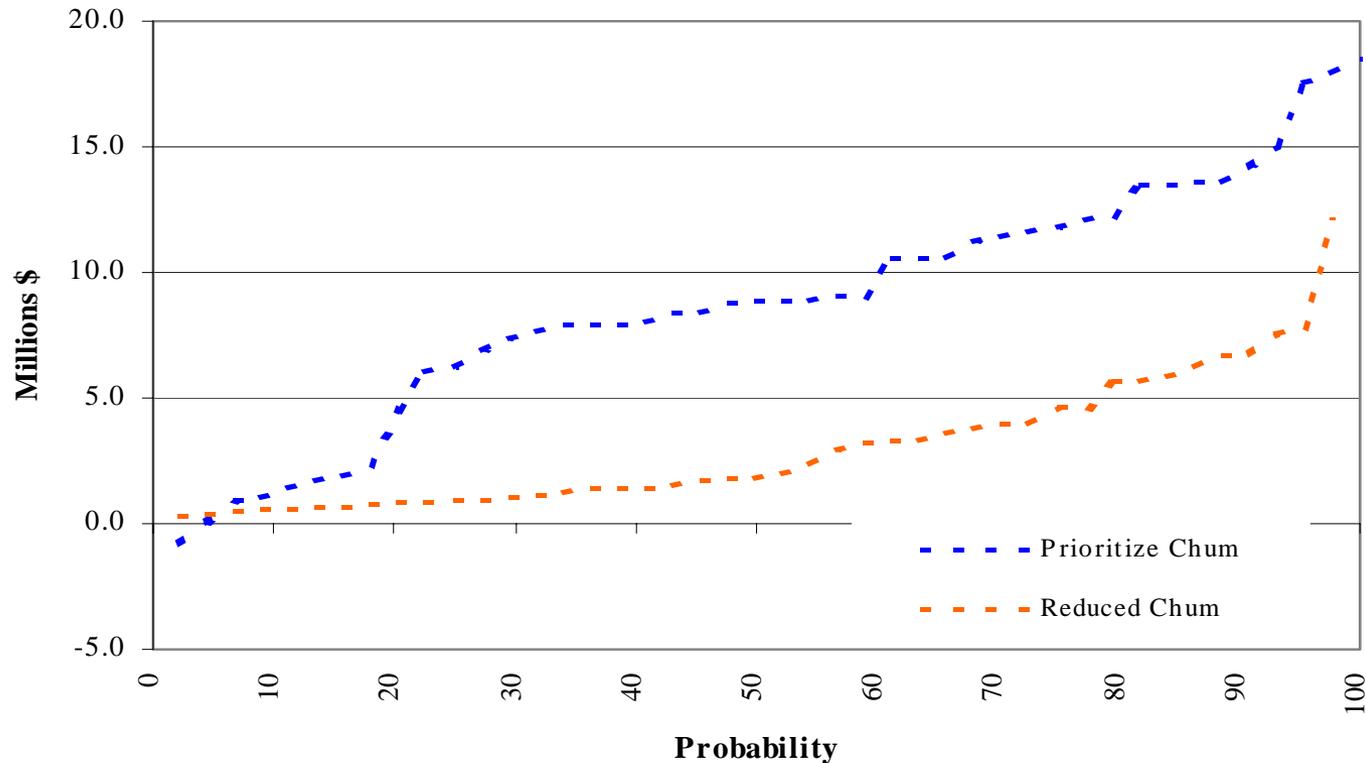
## Probability of Achieving April 15 Upper Rule Curve

	Reduced Chum (3/15)		Reduced Chum (3/31)		Prioritize Apr 15	Prioritize Chum
	Vbar = 65	Vbar = 70	Vbar = 65	Vbar = 70	Vbar = 65	Vbar = 70
Probability	52.3%	43.2%	52.3%	43.2%	77.3%	29.5%
Average Miss	9.2 ft	13.6 ft	13.9 ft	15.9 ft	6.4 ft	23.9 ft
	675 kaf	996.5 kaf	1009 kaf	1158 kaf	459 kaf	1683 kaf

- Prioritize April 15: Abandon chum flows Feb 1, Vernita Bar = 65 kcfs (note that dewatered chum in February may be rewatered in March in some conditions)
- Reduced Chum (3/15): Chum = 115 kcfs February – March 15, Vernita Bar = 65/70 kcfs
- Reduced Chum (3/31): Chum = 115 kcfs February – March 31, Vernita Bar = 65/70 kcfs
- Prioritize Chum: Chum = 125 kcfs February and March, Vernita Bar = 70 kcfs

# BPA Financial Implications

**Incremental Secondary Revenues for Alternative VB/Chum Flows  
(Relative to Prioritizing April 10 URC)**



- Prioritize April 15: Abandon chum flows Feb 1, Vernita Bar = 65 kcfs
- Reduced Chum (3/15): Chum = 115 kcfs February – March 15, Vernita Bar = 65 kcfs
- Prioritize Chum: Chum = 125 kcfs February and March, Vernita Bar = 70 kcfs

# Next Steps

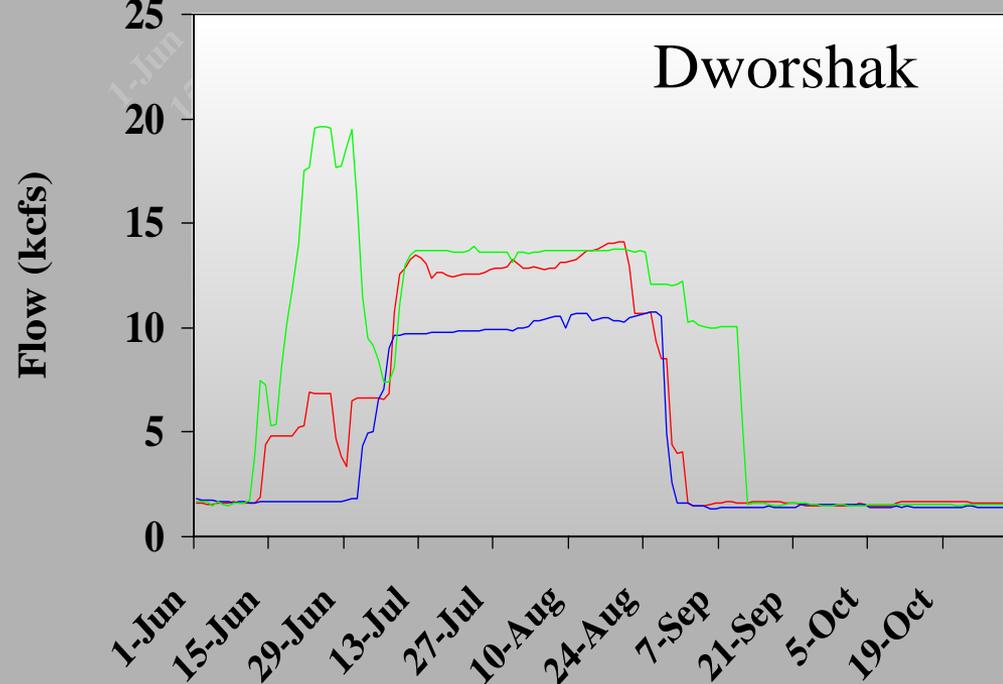
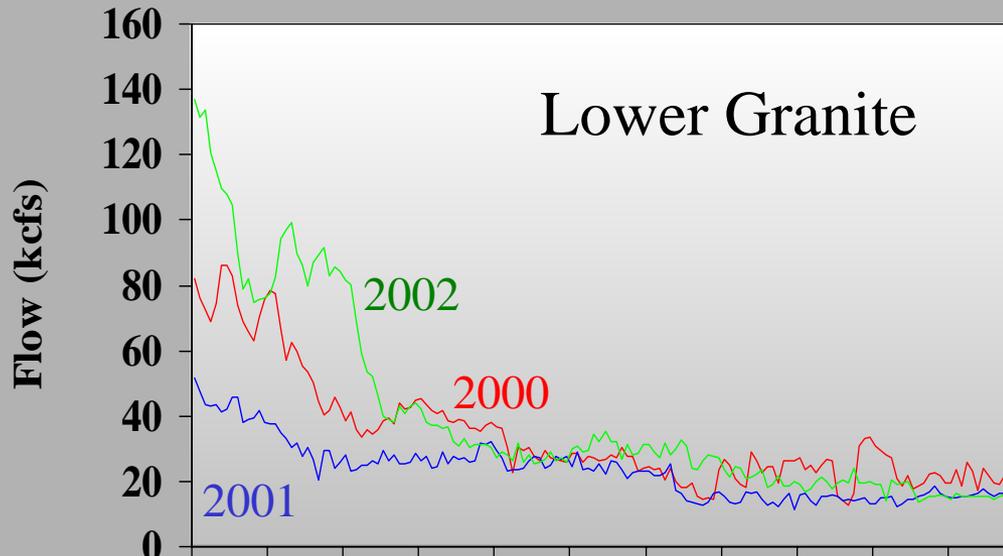
- Test Thursday, January 16, to evaluate number of redds effected if Bonneville tailwater reduced to 11.0 ft.
- TMT meeting January 22 to review hydro analyses which look at impacts to April 10 refill and spring flows under various flow scenarios.

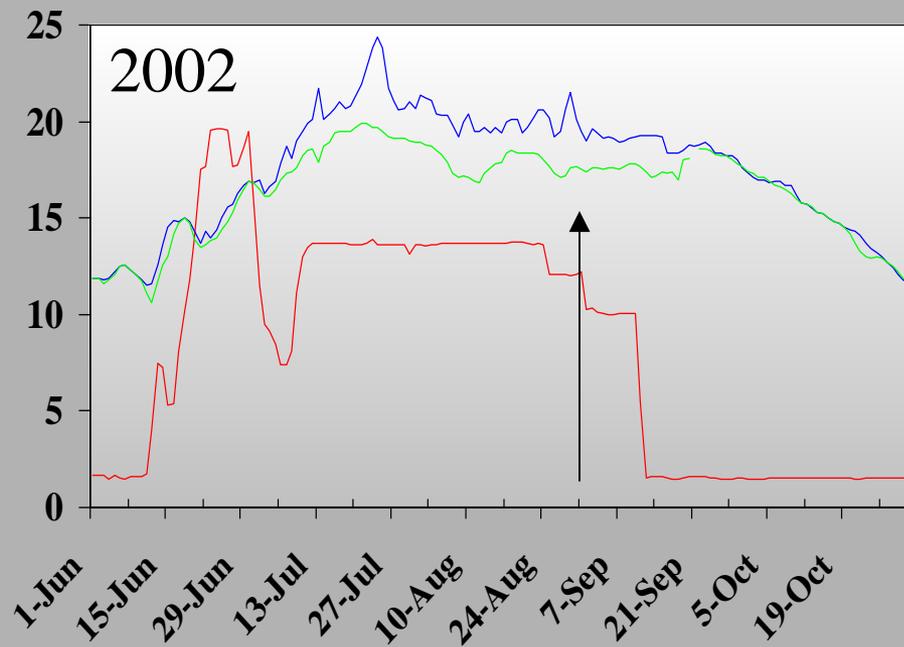
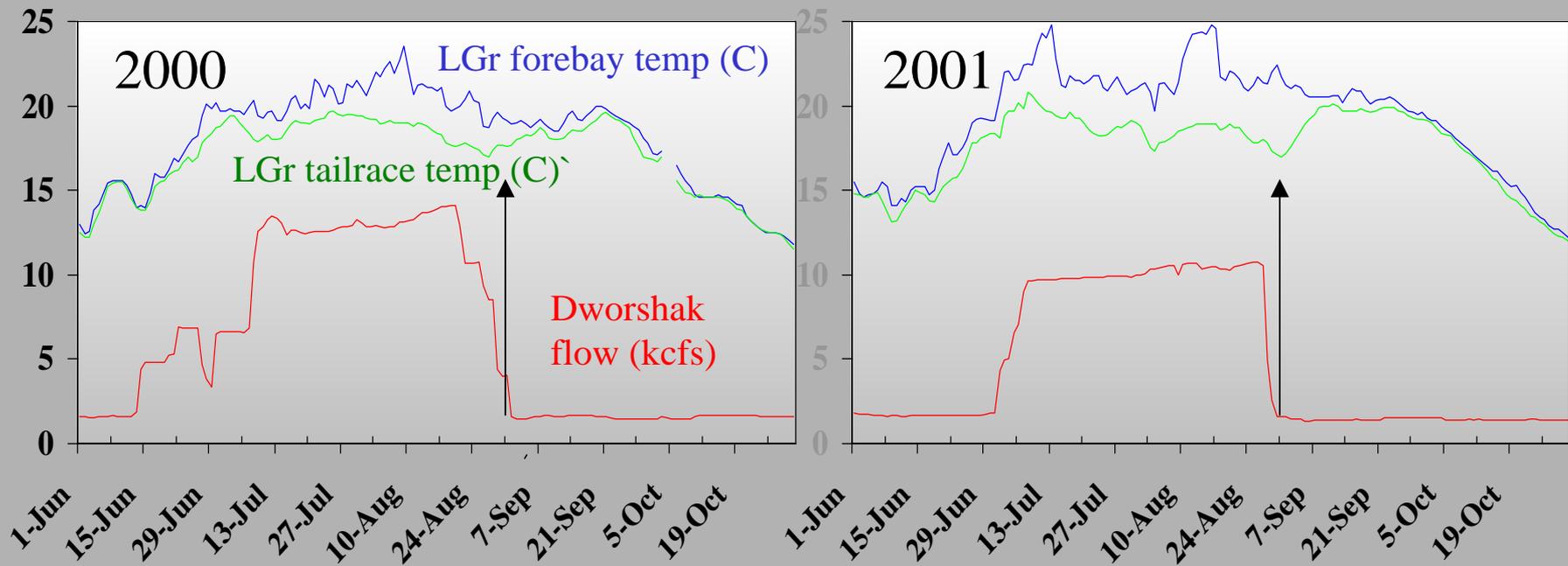
# Effects of Dworshak Water on Passage of Adult Salmon And Steelhead: 2002 September Releases

**Chris Peery, Matt Keefer and Tami Reischel**  
**Idaho Cooperative Fish and Wildlife Research Unit**  
**University of Idaho**

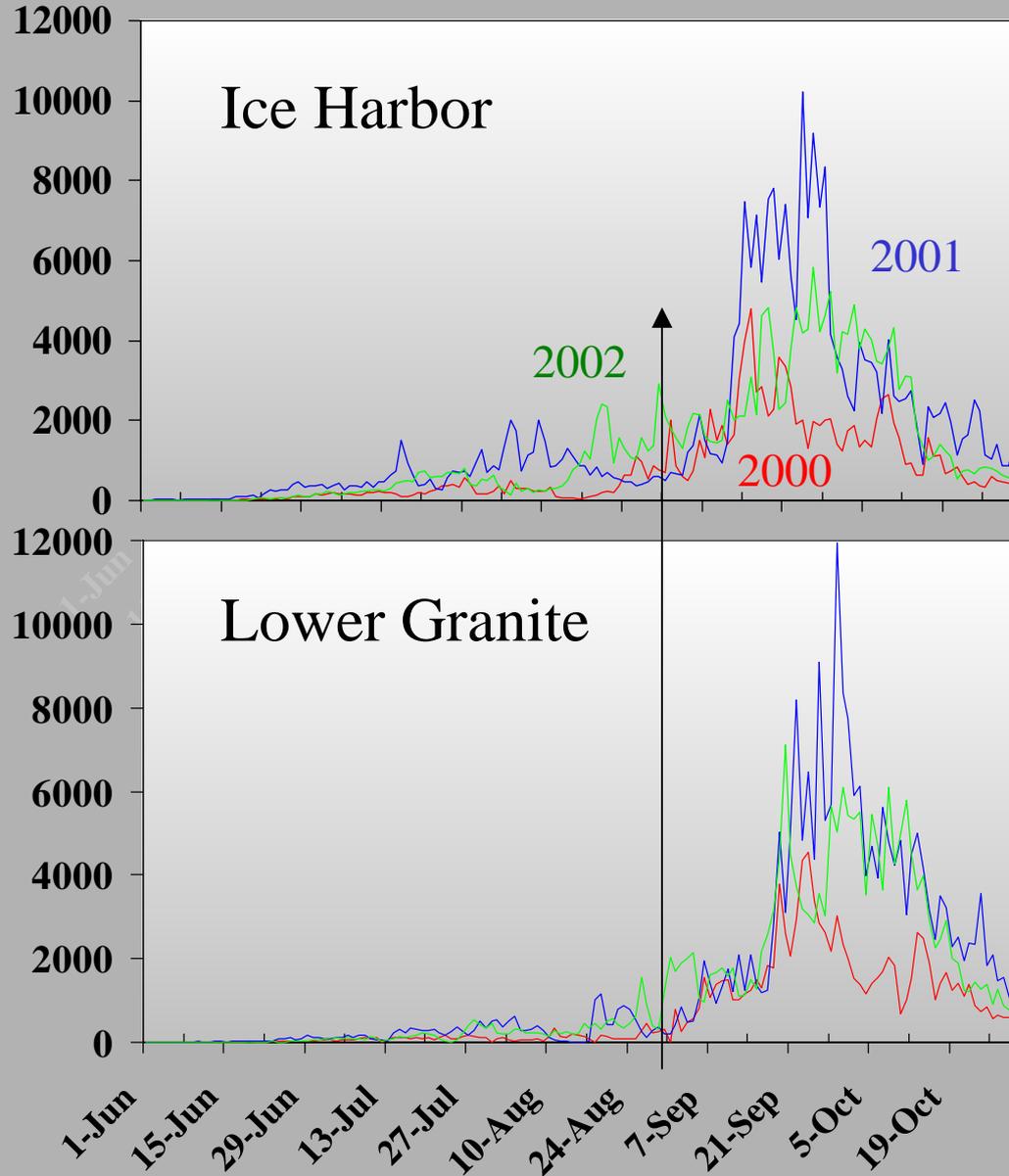


# Flow at Lower Granite and Dworshak

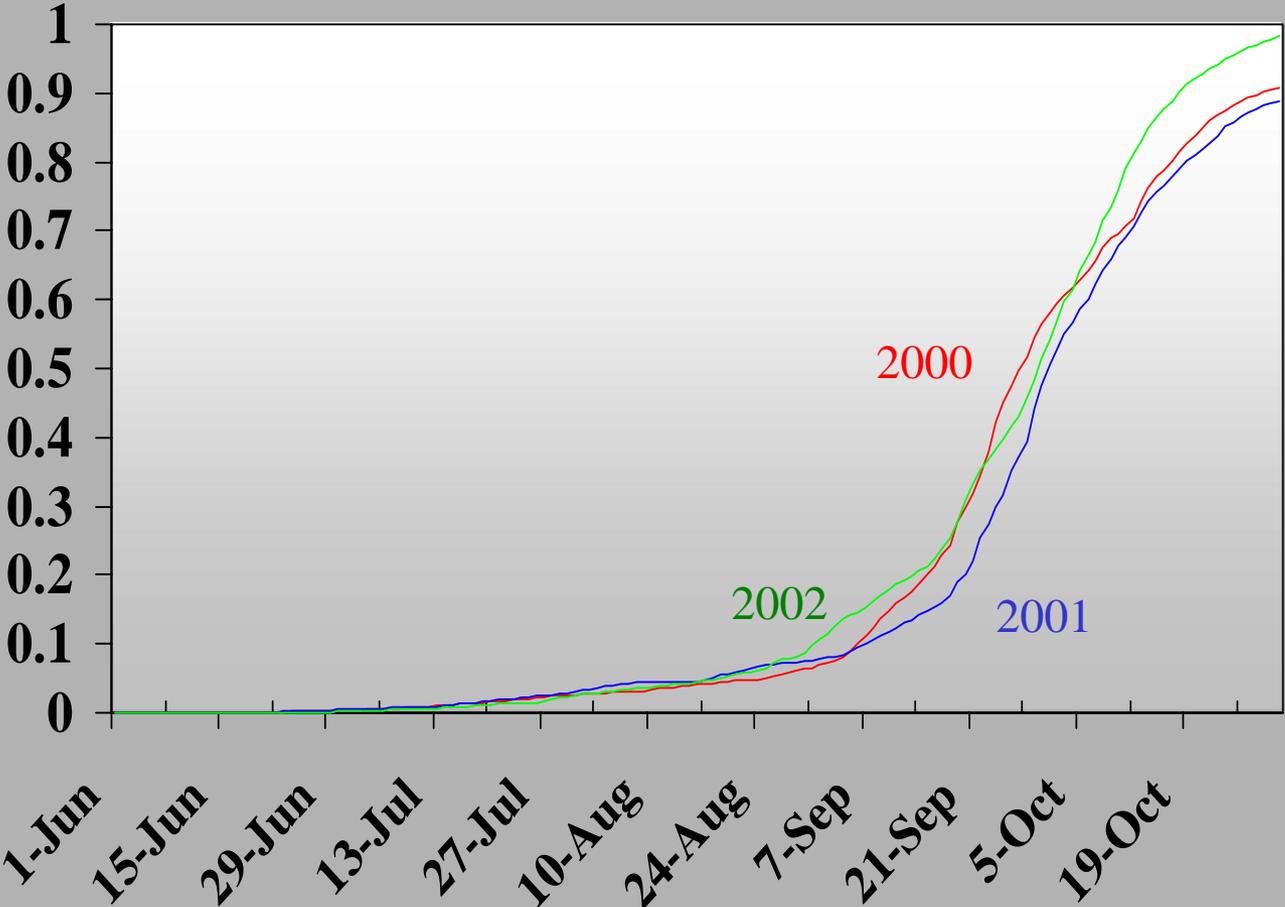




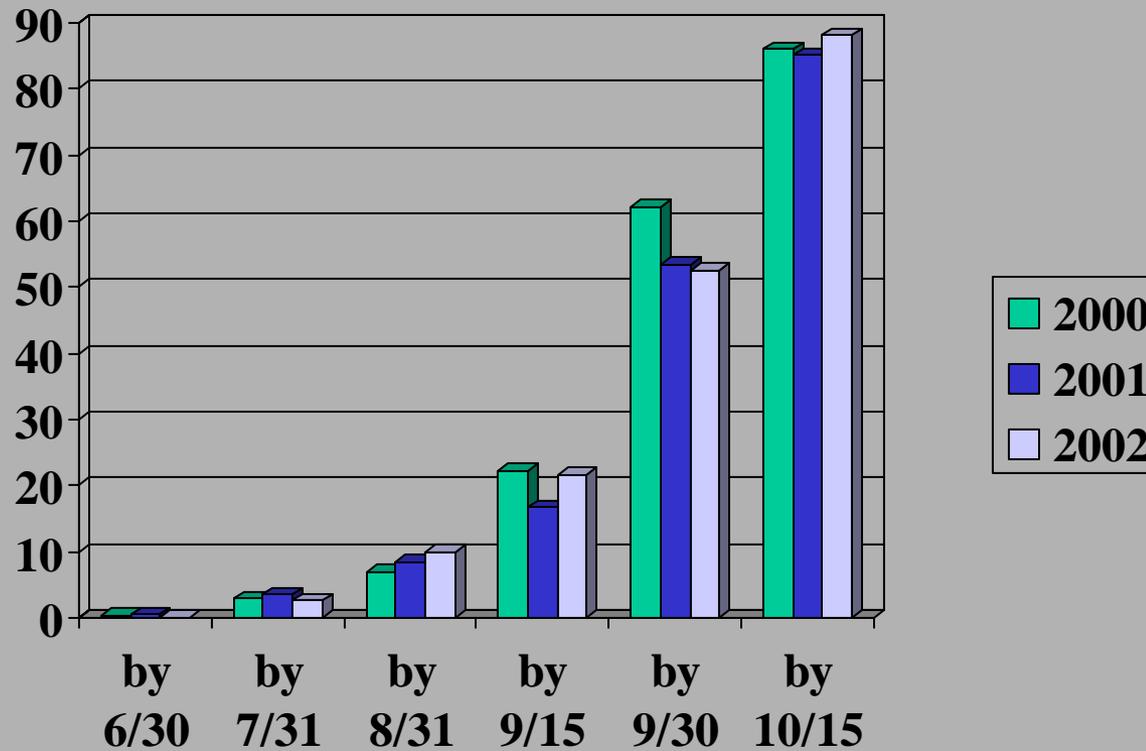
# Adult steelhead counts through 31 Oct



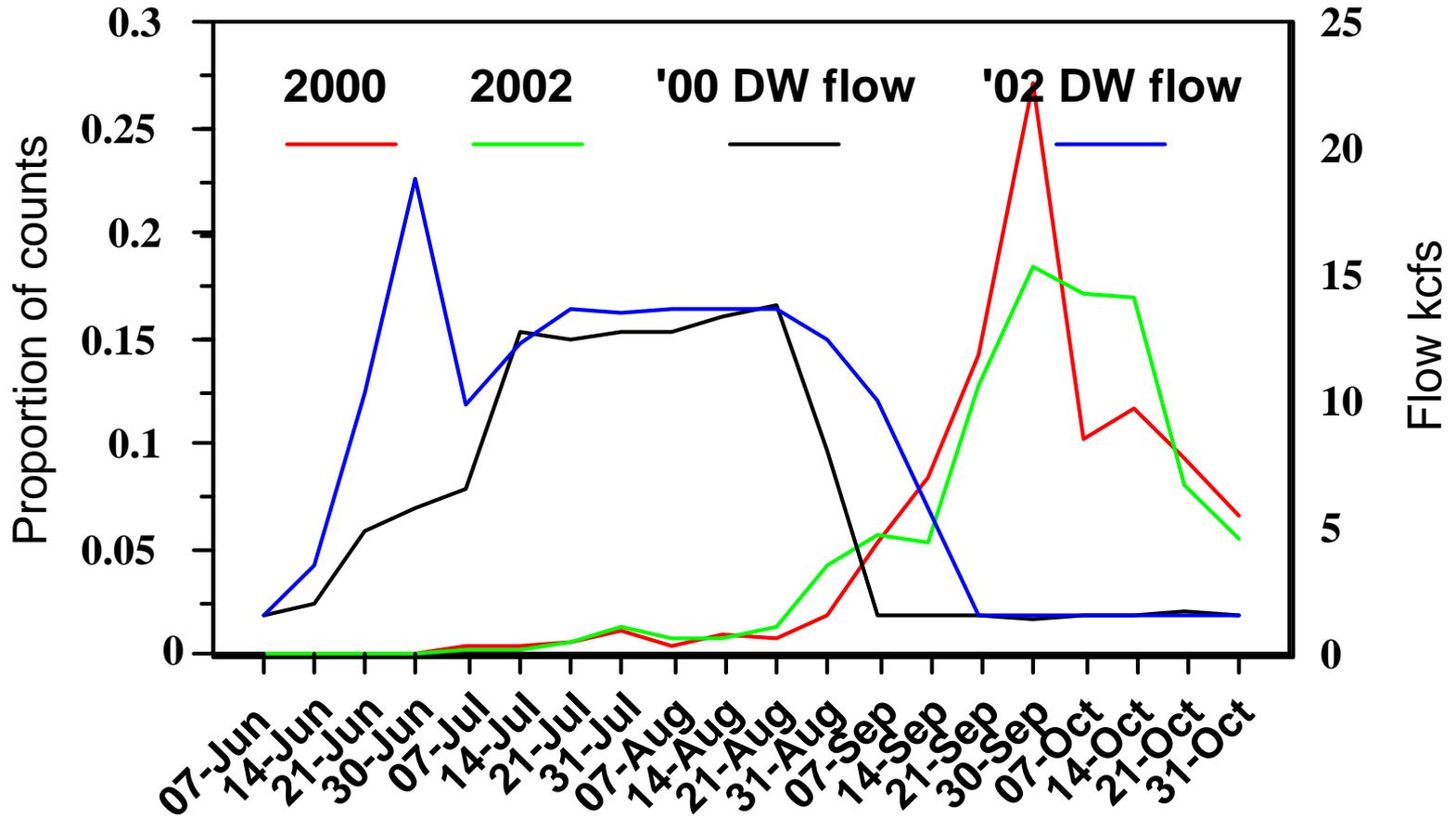
# Proportion of IH count (through 31 Oct) that had passed LGr by dates



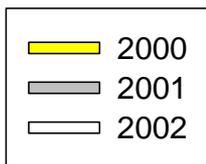
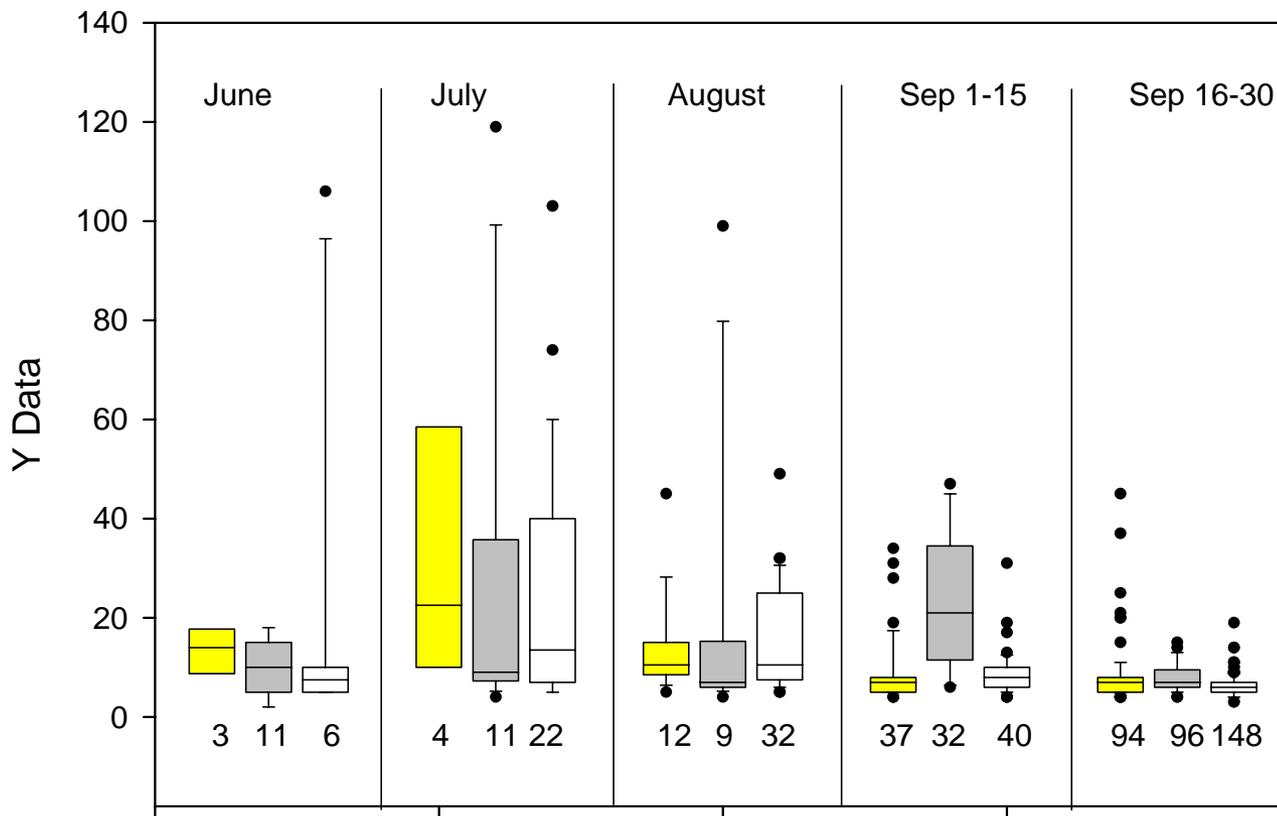
# Proportion of GR count (through 31 Oct) that had passed by dates



# Lower Granite Steelhead



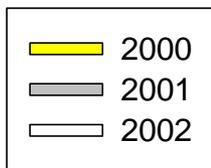
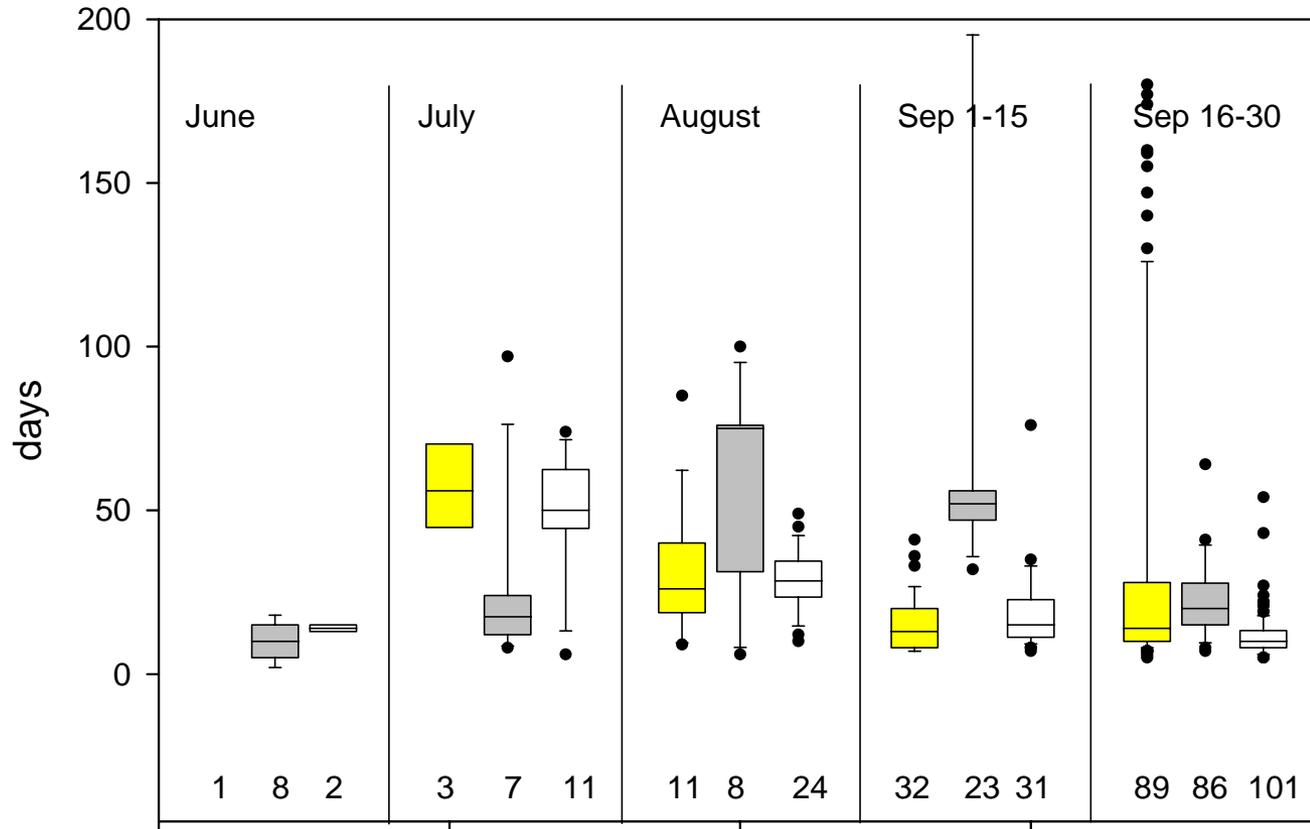
# date at IH to date at LGr



## IH-GR passage times: median (N)

	2000	2001	2002	2000 vs 2002	
				Means	Medians
June	14 (3)	9 (11)	7.5 (6)		
July	22.5 (4)	7 (11)	13.5 (22)		
August	10.5 (12)	21 (9)	10.5 (32)		
1-15 Sep	7 (37)	7 (32)	8 (40)	P = 0.98	P = 0.11
16-30 Sep	7 (94)	7 (96)	6 (148)	P = 0.0002	P = 0.0001

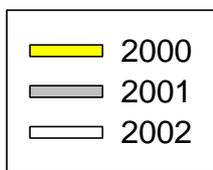
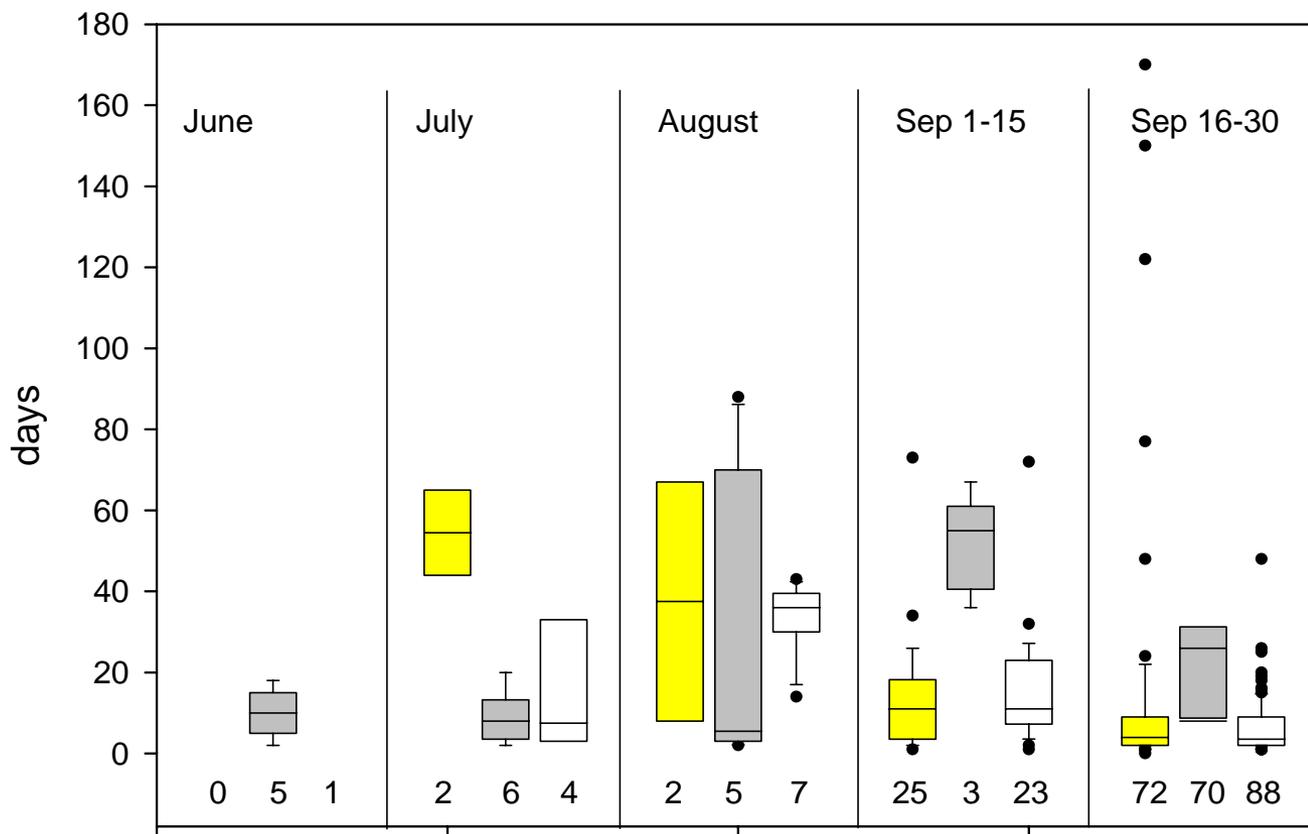
# date at IH to date at SNR/CWR



## IH-SNR/CWR passage times: median (N)

	2000	2001	2002	2000 vs 2002	
				Means	Medians
June	84 (1)	17.5 (8)	14 (2)		
July	56 (3)	75 (7)	50 (11)		
August	26 (11)	52 (8)	28.5 (24)	P = 0.62	P = 0.75
1-15 Sep	13 (32)	20 (23)	15 (31)	P = 0.15	P = 0.12
16-30 Sep	14 (89)	14.5 (86)	10 (101)	P = 0.0001	P = 0.0001

# date at LGr to date at SNR/CWR



## GR-SNR/CWR passage times: median (N)

	2000	2001	2002	2000 vs 2002	
				Means	Medians
June	- (0)	8 (5)	8 (1)		
July	54.5 (2)	5.5 (6)	7.5 (4)		
August	37.5 (2)	55 (5)	36 (7)		
1-15 Sep	11 (25)	26 (3)	11 (23)	P = 0.58	P = 0.43
16-30 Sep	4 (72)	10.5 (72)	3.5 (88)	P = 0.04	

## GR-SNR/CWR passage times: median (N)

	2000	2001	2002	2000 vs 2002	
				Means	Medians
June	- (0)	8 (5)	8 (1)		
July	54.5 (2)	5.5 (6)	7.5 (4)		
August	37.5 (2)	55 (5)	36 (7)		
25-31 August	8 (1)		26 (2)		P = 0.34
1-15 Sep	11 (25)	26 (3)	11 (23)	P = 0.58	P = 0.43
1-7 Sep	15 (7)		17 (13)		
8-15 Sep	10 (18)		9 (10)		

# Tracking MAP Fish in Lower Granite Reservoir

		2001				2002			
		N	Avg.	Min.	Max.	N	Avg	Min.	Max.
17-23 Aug.	Fish	4	15.4	11.2	19.2	7	16.3	12.8	17.6
	River		16.7	14.5	19.7		17.6	14.5	20.6
24-31 Aug.	Fish	13	14.0	12.8	16.3	11	13.7	12.8	18.4
	River		16.1	13.8	20.6		17.3	14.6	21.3
1-8 Sep.	Fish	12	19.2	14.4	21.6	15	14.8	12.8	17.6
	River		19.3	15.4	21.3		17.5	14.7	21.0
9-15 Sep.	Fish	4	18.4	16.8	20.0	14	15.6	13.6	19.2
	River		19.0	17.9	20.2		16.4	14.1	19.8
16-22 Sep.	Fish	10	16.4	10.0	19.2	23	17.4	12.8	20.8
	River		19.1	17.6	20.4		17.9	14.1	20.8

## RDST fish Recaptured at Lower Granite Dam in 2002

1-15 Aug: 2 Steelhead

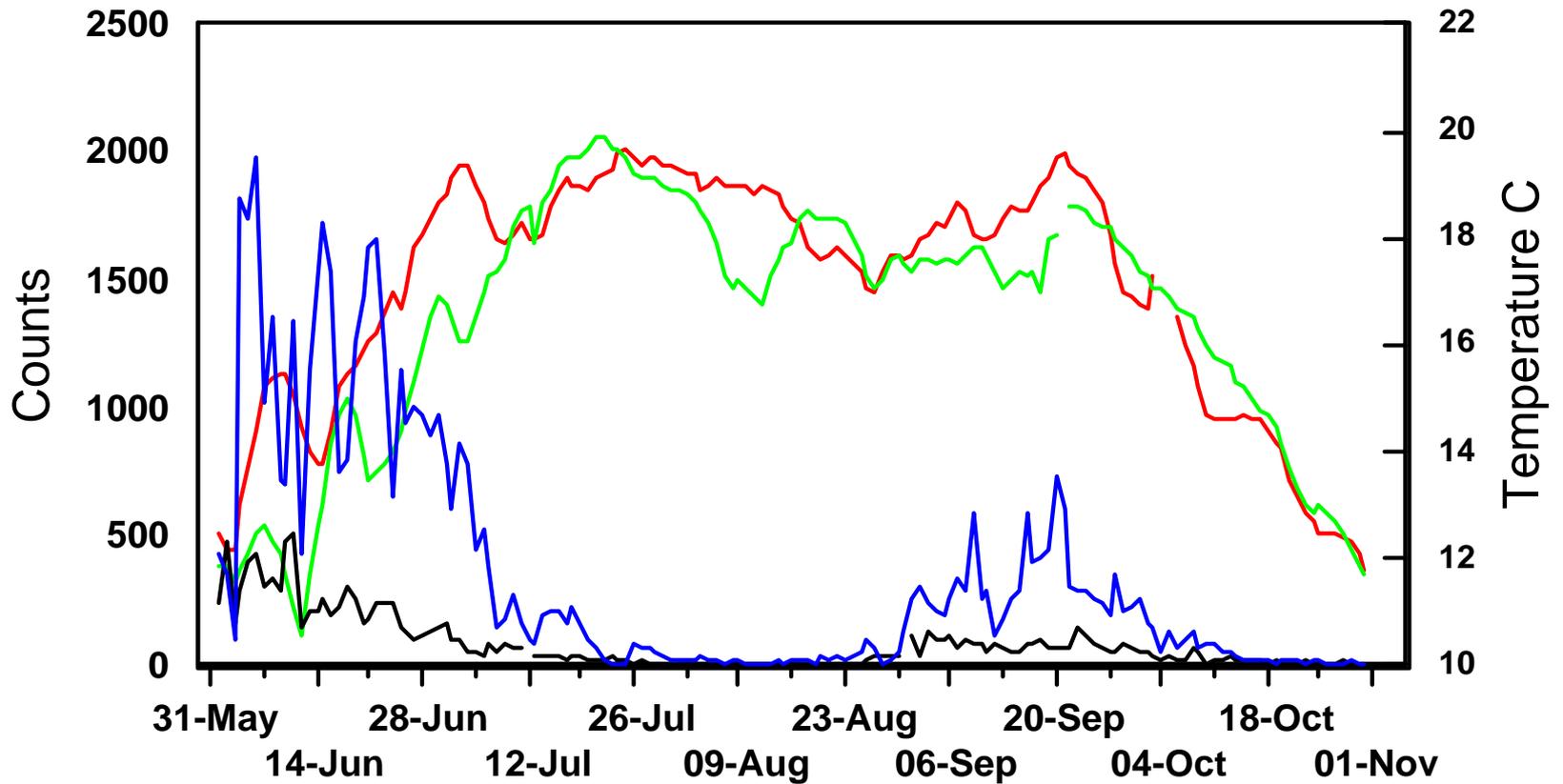
16-31 Aug: 5 Steelhead, 1 Chinook

1-15 Sep: 9 Steelhead, 2 Chinook

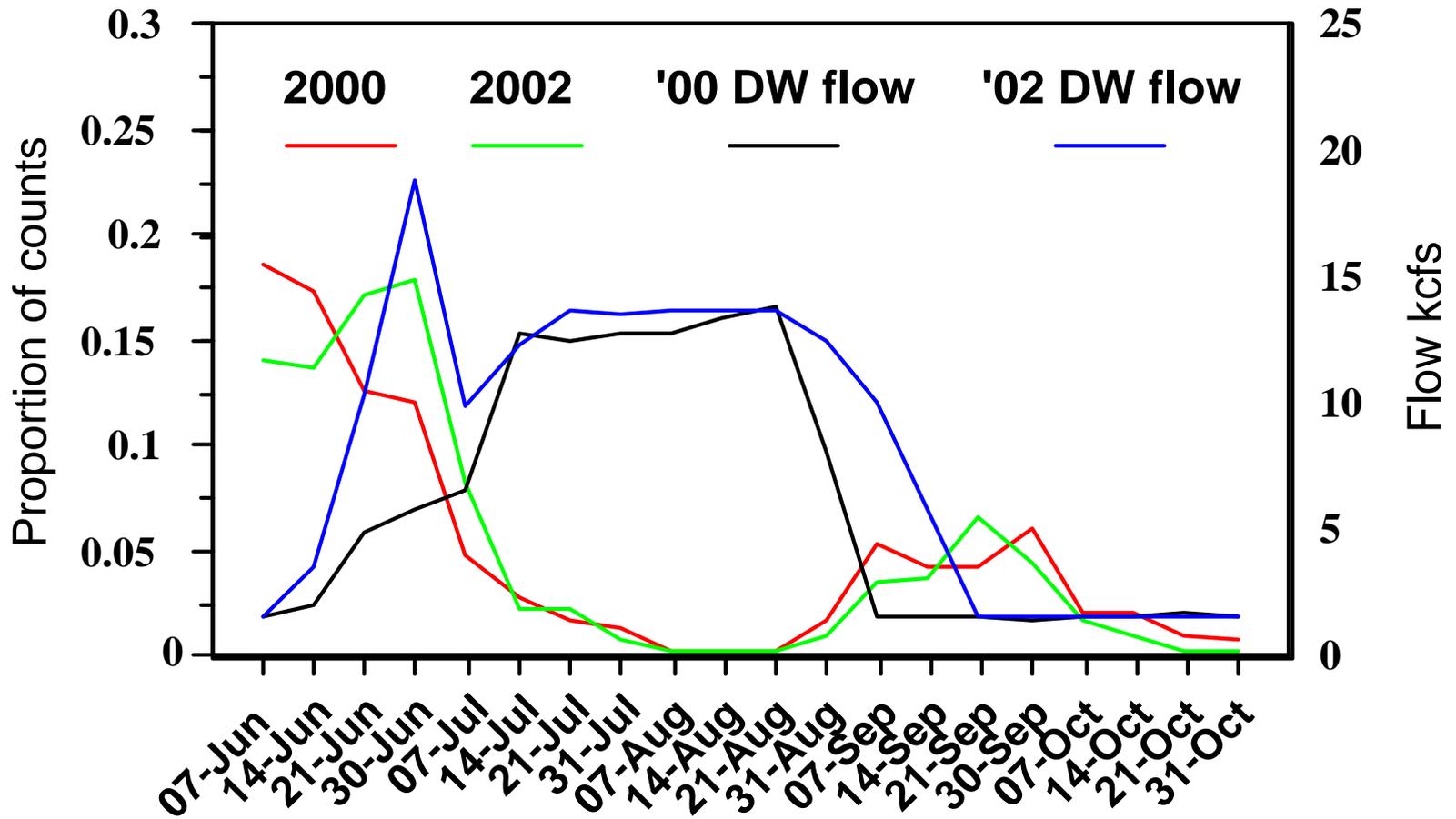
16-31 Sep: 30 Steelhead, 3 Chinook

# Lower Granite Chinook Salmon

— '00 GR Tailrace      — '02 GR Tailrace      — '00 CK      — '02 CK



### Lower Granite Chinook salmon





# **COLUMBIA RIVER REGIONAL FORUM**

## **TECHNICAL MANAGEMENT TEAM**

January 22, 2003

### **FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS**

Facilitator: Jacque Abel

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.

#### **Instream Juvenile Fish Survival:**

Steve Smith, NMFS Science Center, presented information on a 10 year pit-tag juvenile fish survival study. He concluded from the study that there is a weak correlation between survival and flow below the flow threshold and no correlation between survival and flow above the threshold (although survival is high in high flow years). Oregon reminded the group that immeasurable variables were not included in the study.

#### **Lower Snake Adult Fish Migration:**

Chris Perry, University of Idaho, presented a study on Lower Snake adult fish migration. He concluded from the study that temperature has an impact on travel time of adult migrating fish. The next step for the researchers is to look at impacts of temperature and travel time on adult fish survival. Chris's presentation will be linked to the TMT website.

#### **Single Trace Procedure (STP):**

Harold Opitz, River Forecast Center, presented information on the STP model that is being used in forecasts. Due to technical difficulties, Harold will present test results of the model at the next TMT meeting. The advantages to using this model, he reported, are: it presents trend information of where the precipitation season is headed; it can factor in other impacts to the system such as regulation and local flows, the information is available in text format for easy downloading to spreadsheets, and it provides consistency since just one model is being used. The RFC would like to use this model as a substitute for the spring SSARR model. The next step, he said, is the "ESP" model.

#### **Chum Flow Scenarios:**

The Action Agencies each presented alternative chum flow scenarios in the hopes that the Salmon Managers could use the information to make a recommendation for operations for the next two weeks.

The COE used its Q Adjust model to run two scenarios:

- Alternative 1 targets April 10 flood control at Grand Coulee and meets 65 kcfs at Vernita Bar.
- Alternative 2 meets 125 kcfs for chum and targets April 10 flood control at Grand Coulee.

BPA ran a number of scenarios and showed spring flow, April 10 refill, and BPA financial implications from each of the scenarios.

Shane Scott gave a presentation of WDFW's qualitative chum surveys at Ive's Island on January 16<sup>th</sup>. Shane stressed the importance of striking a balance in the system.

The group spent the rest of the meeting discussing operation recommendations based on the information that was shared by the Action Agencies and Washington. No consensus was reached on the issue. The Salmon Managers met the following day to discuss the issue. TMT then scheduled a conference call for Friday, Jan. 24, 1:00 – 2:00 hours to further discuss the chum issue.

Assumptions:

- \* Streamflows were adjusted to the January Final Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were actual Dec 31 observed data.
- \* Hungry Horse operates to VARQ while meeting minimum flows at Columbia Falls, targets full in June, and drafts to 3540 ft by 31 Aug.
- \* Brownlee operates to flood control elevations.
- \* Dworshak targets full in June, releases a maximum of 13,000 cfs in July - August for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on minimum flow or VARQ flood control Dec - Mar releases flow for sturgeon and bull trout in May and June, targets full in July, and drafts to 2439 ft by 31 Aug.
- \* **Alternative 1: Targets April 10 Flood control at Grand Coulee and meets 65 kcfs at Vernita Bar (Jan-Mar)**
- \* **Alternative 2: Meets 125 kcfs Jan-Mar for chum and targets April 10 Flood control at Grand Coulee**

Results:

Priest Rapids Meets Flow Objectives of 70 kcfs Jan - Apr1 and 135 kcfs Apr2 - Jun:

Month	Alternative 1 (Apr 10)		Alternative 2 (Chum)	
	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Jan	54	78	59	86
Feb	19	68	45	77
Mar	24	69	39	73
Apr1	38	93	22	65
Apr2	15	114	8	104
May	50	148	48	147
Jun	38	112	36	112

Lower Granite Meets Flow Objectives of 85 kcfs in Apr - May, 73.3 kcfs in June and 50 kcfs in Jul - Aug:

Month	Alternative 1 (Apr 10)		Alternative 2 (Chum)	
	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Apr2	4	60	4	60
May	38	92	38	92
Jun	33	76	33	76
Jul	8	42	8	42
Aug1	0	32	0	32
Aug2	0	23	0	23

McNary Meets Flow Objectives of 220 kcfs in Apr2 - Jun and 200 kcfs in Jul - Aug:

Month	Alternative 1 (Apr 10)		Alternative 2 (Chum)	
	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Apr2	5	170	4	161
May	59	230	57	229
Jun	17	209	17	208
Jul	1	151	1	151
Aug1	0	142	0	142
Aug2	0	128	0	128

Bonneville Meets Flow Objectives of 125 kcfs in Jan - Apr:

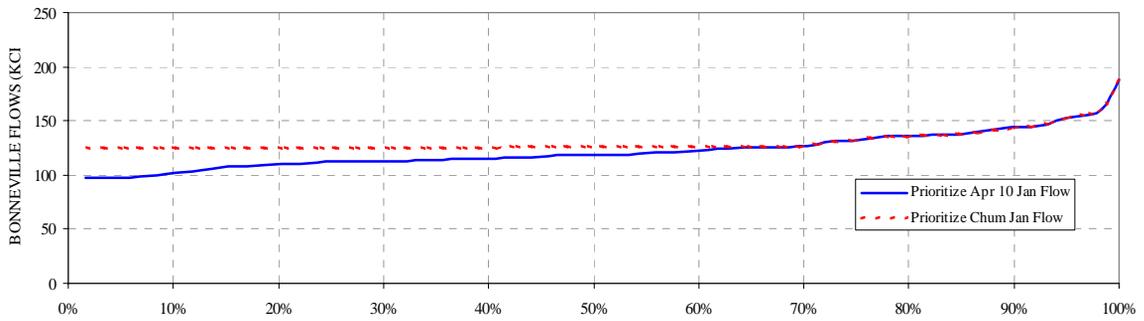
Month	Alternative 1 (Apr 10)		Alternative 2 (Chum)	
	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Jan	22	123	59	130
Feb	13	117	55	127
Mar	21	123	22	127
Apr1	52	163	32	134
Apr2	56	191	53	181

Projects Refill by 30 June:

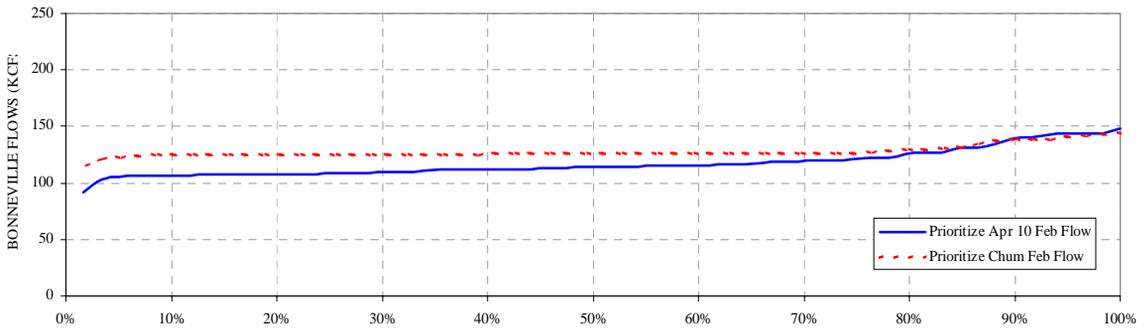
Month	Alternative 1 (Apr 10)		Alternative 2 (Chum)	
	Occurrences out of 59 Years	Average Elevation on 30 Jun for 59 Years	Occurrences out of 59 Years	Average Elevation on 30 Jun for 59 Years
Libby *	8	2451	8	2451
Hungry Horse	3	3556	3	3556
Grand Coulee	59	1288	59	1288
Dworshak	17	1594	17	1594

\* Libby refills 58 out of 59 years by 31 Jul with an average elevation of 2458.9 ft for the 59 years in both alternatives.

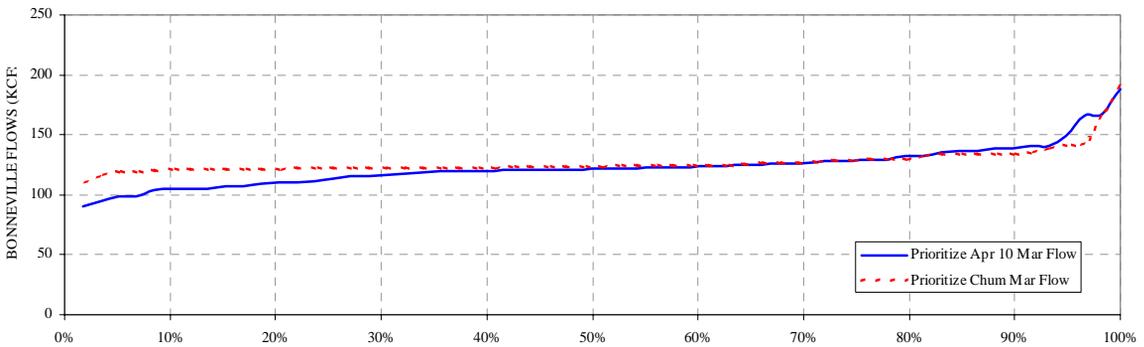
### BONNEVILLE JAN OUTFLOWS



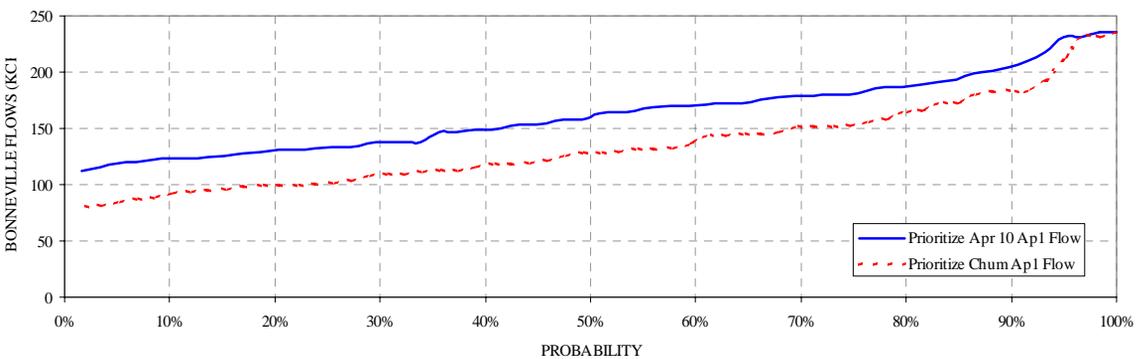
### BONNEVILLE FEB OUTFLOWS



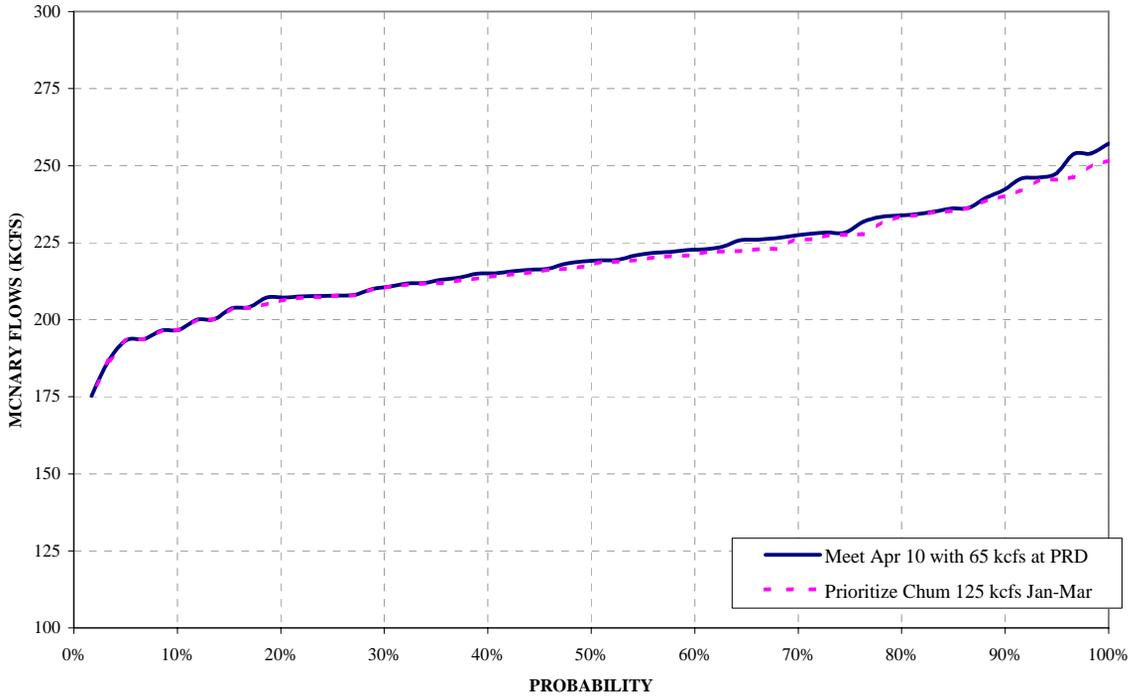
### BONNEVILLE MAR OUTFLOWS



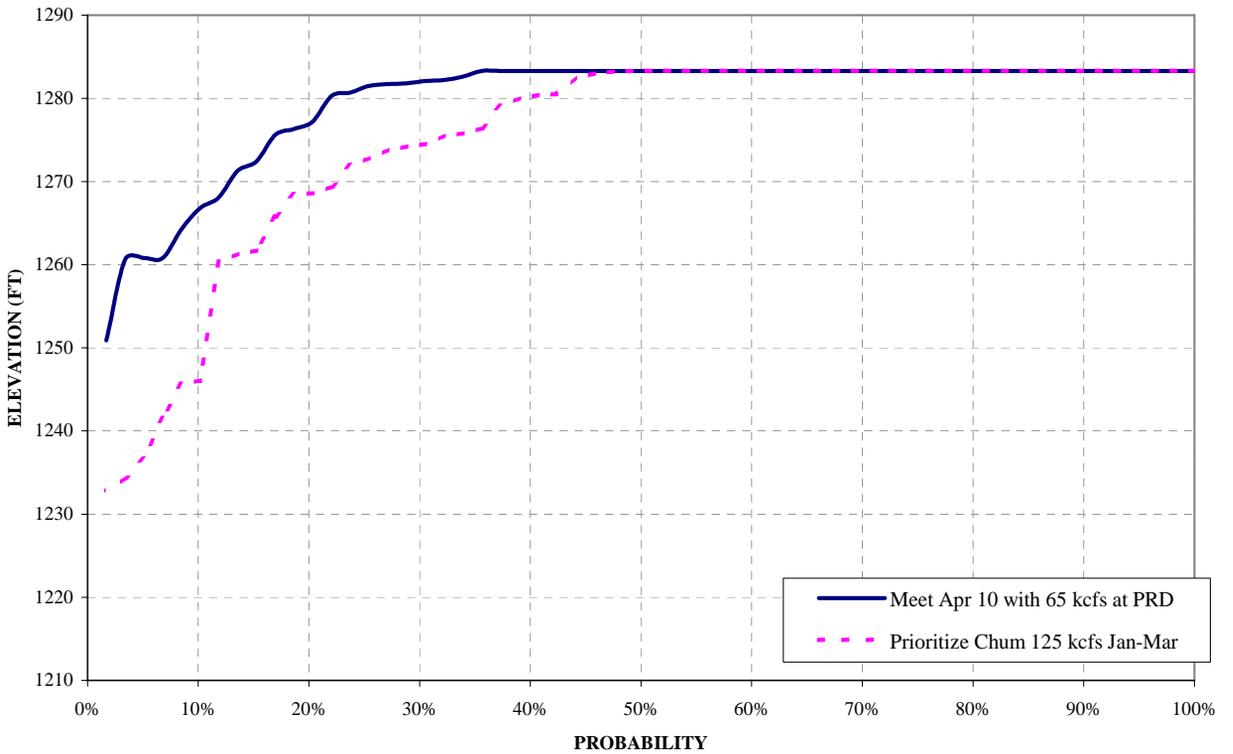
### BONNEVILLE Apr 1-15 OUTFLOWS



**MCNARY OUTFLOW  
MAY-JUNE AVERAGE**



**GRAND COULEE  
APR 15 ELEVATION**



# NMFS Survival Studies 1993-2002

Technical Management Team  
January 22, 2003  
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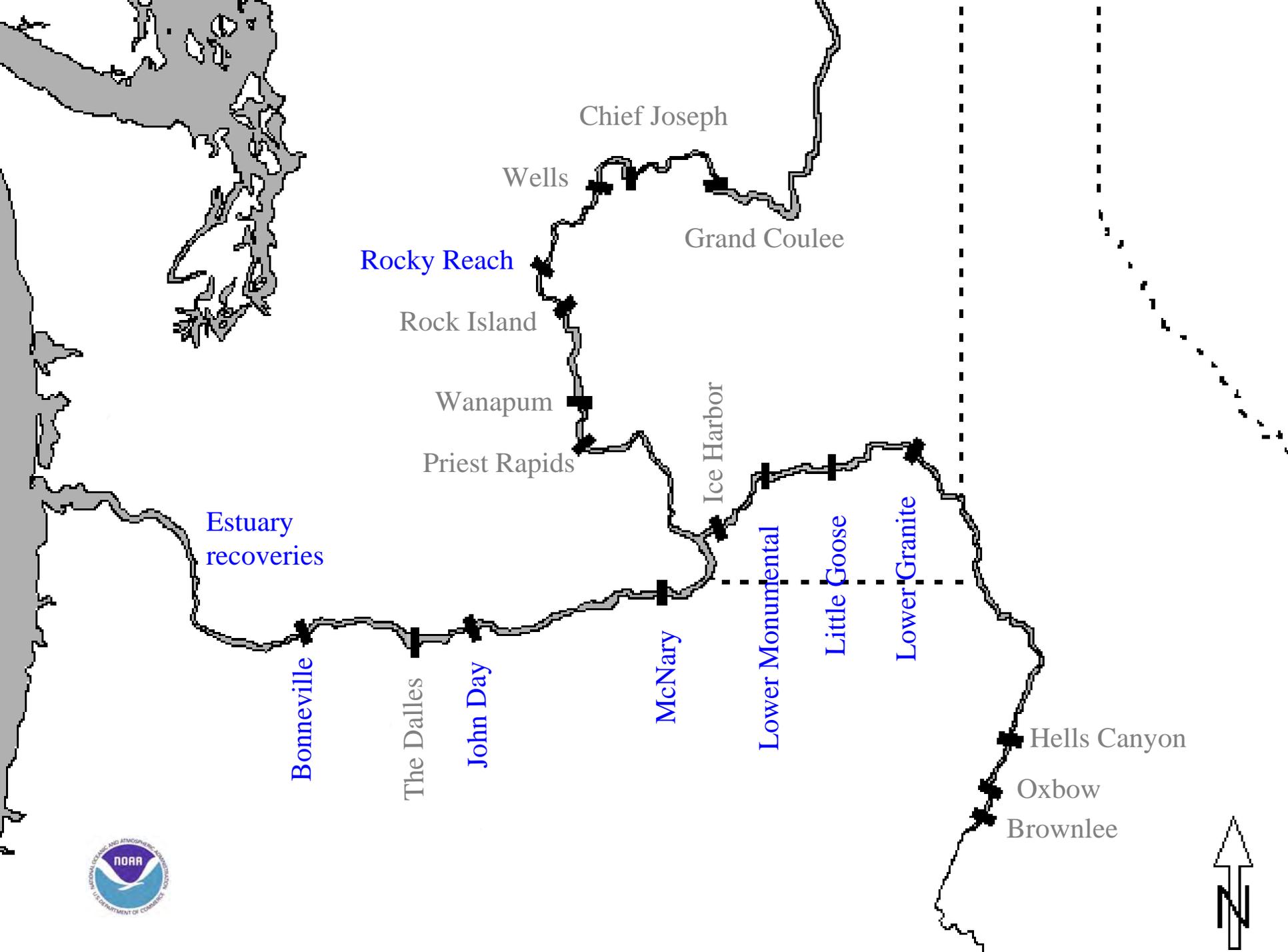
# Results for

- Yearling chinook salmon survival from Snake River Basin hatcheries to LGR
- Yearling chinook salmon and steelhead survival through individual reaches
- Their survival through the entire hydropower system
- Survival for subyearling fall chinook in the Snake River and from McN to JD



'87 1 4

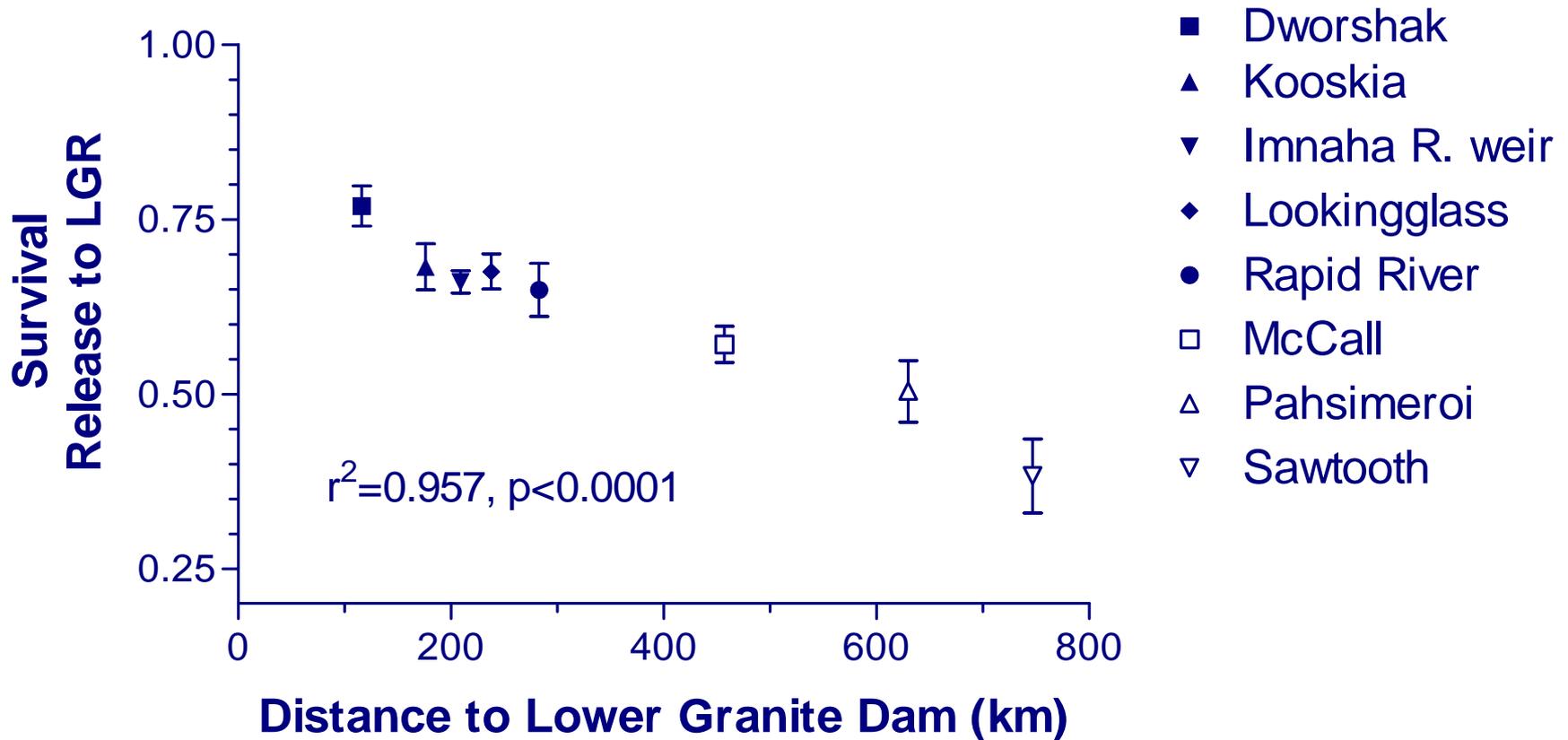




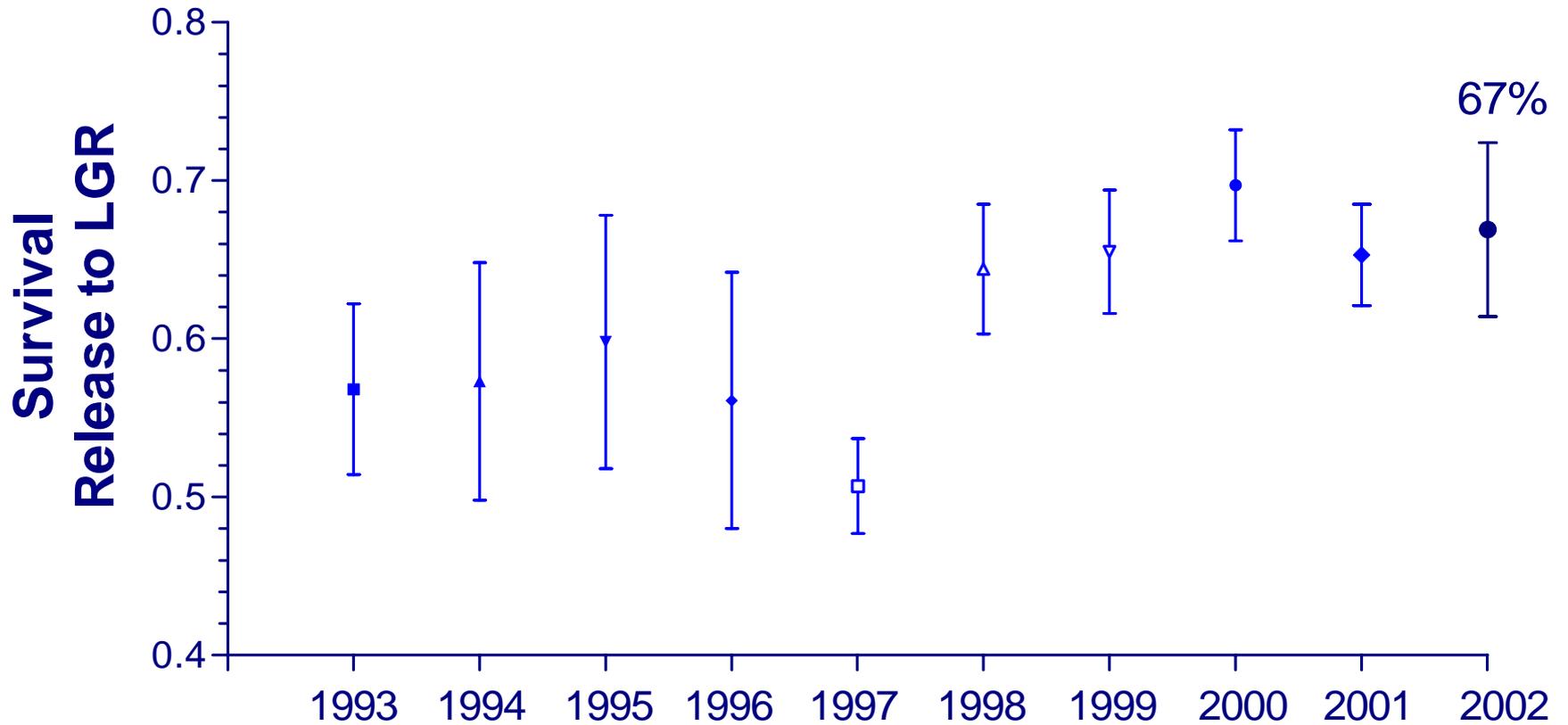


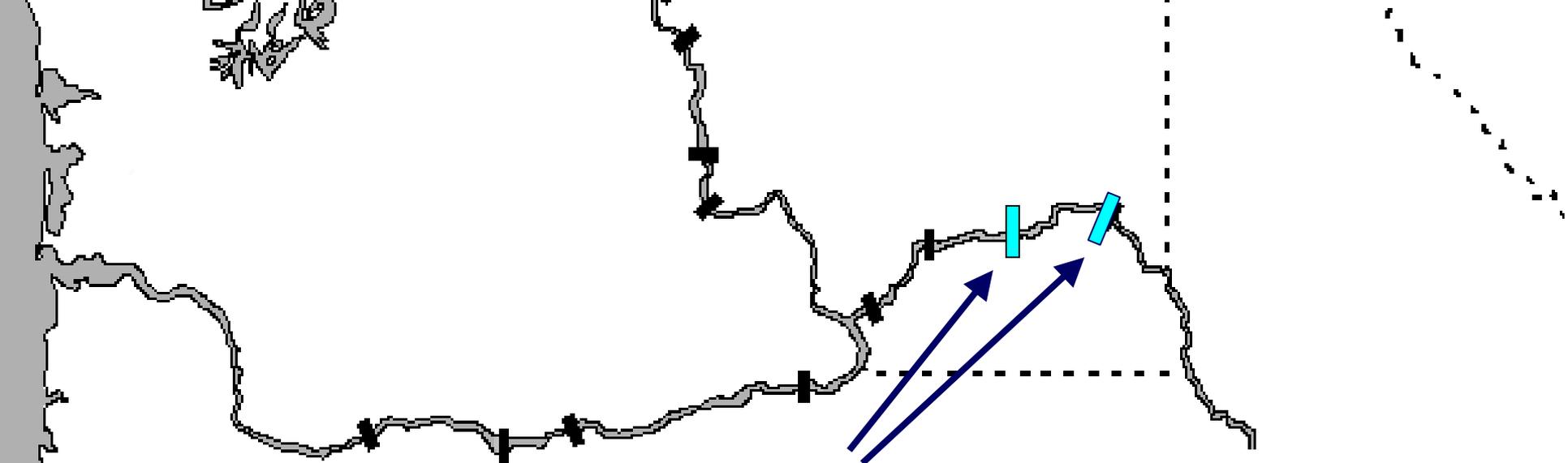


# Hatchery yearling chinook salmon (1993-2002)



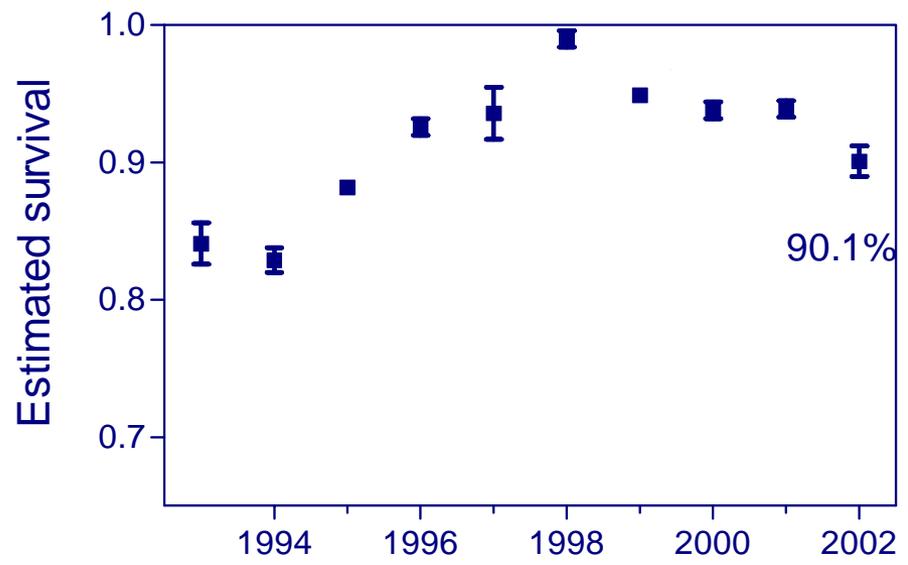
# Yearling chinook salmon All Snake River Basin hatcheries combined



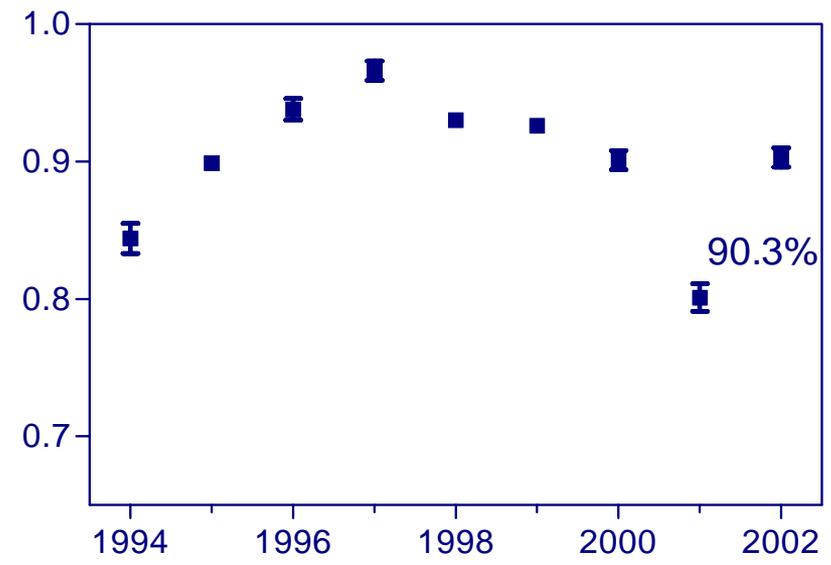


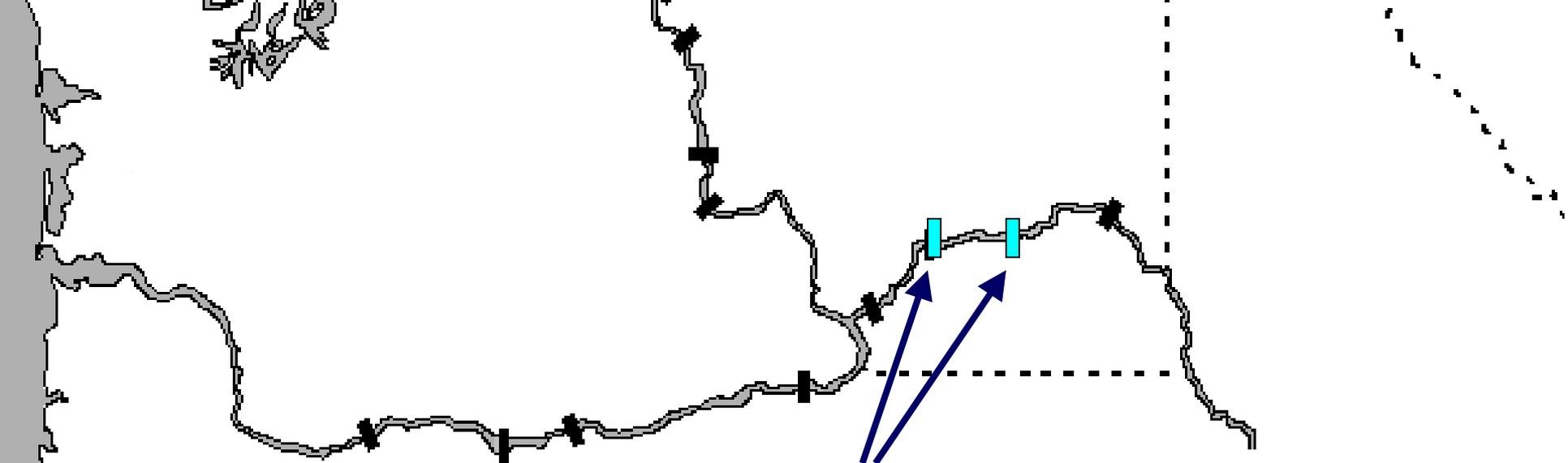
**Lower Granite to Little Goose**

Yearling chinook



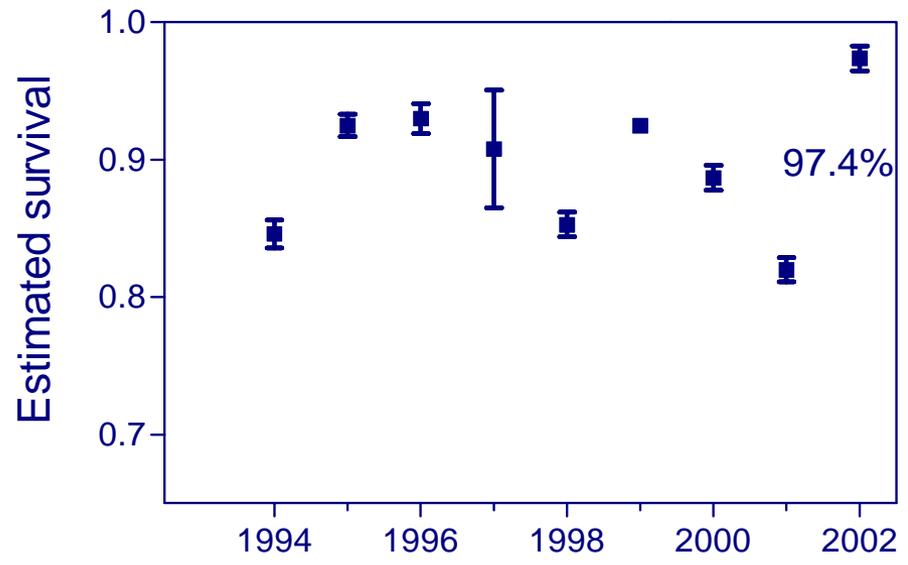
Steelhead



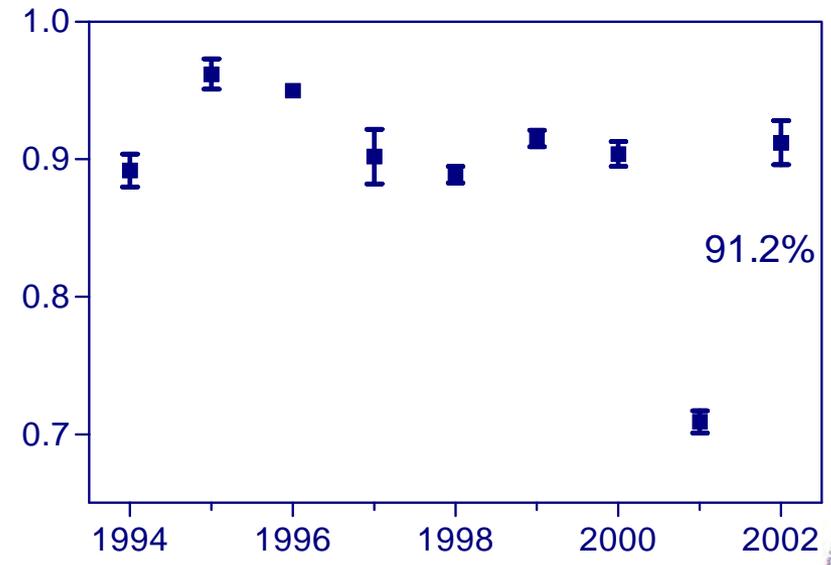


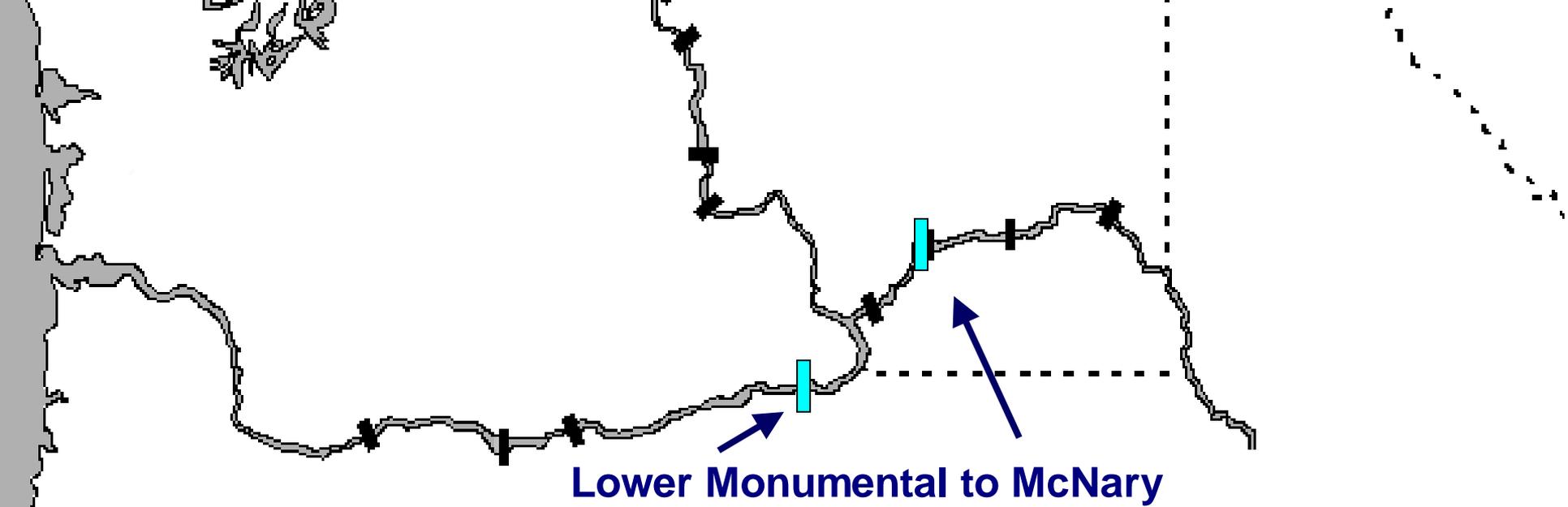
### Little Goose to Lower Monumental

Yearling chinook

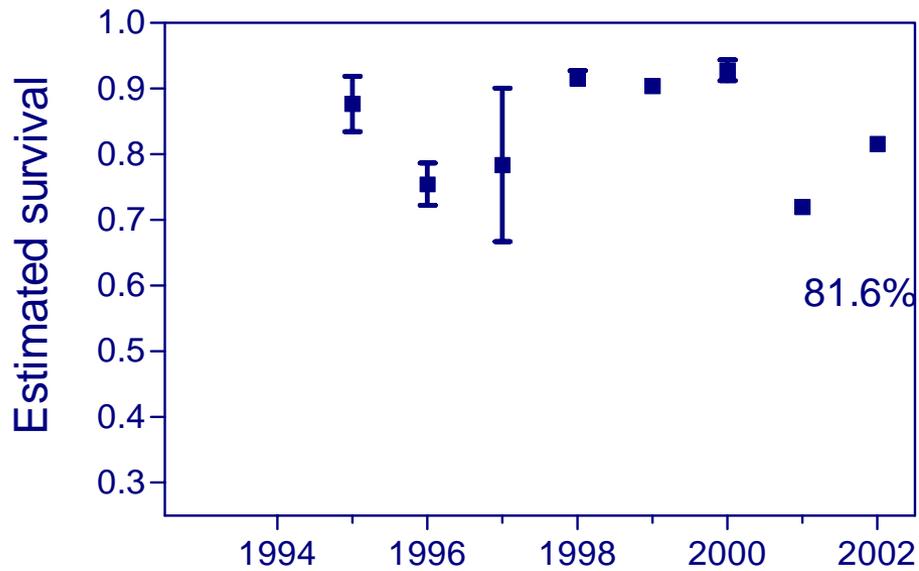


Steelhead

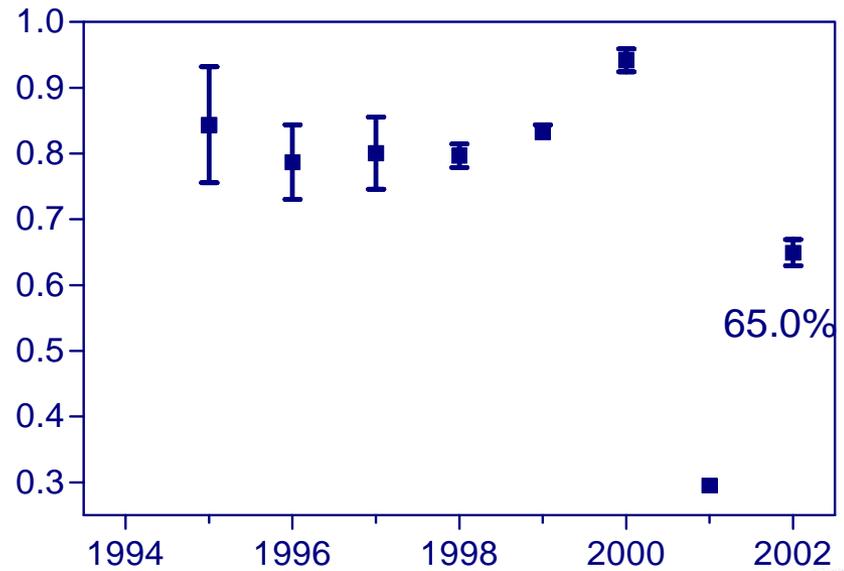




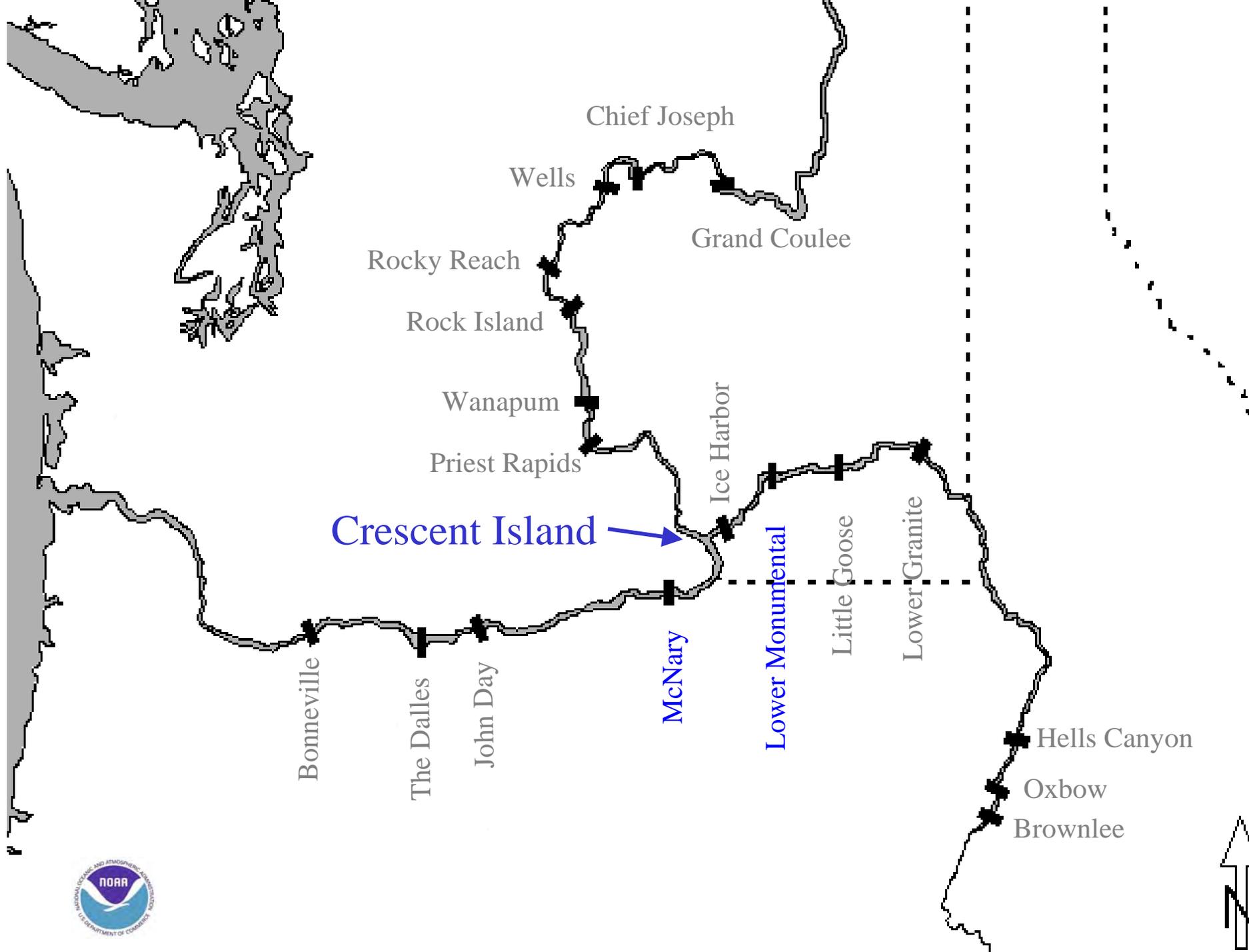
Yearling chinook



Steelhead

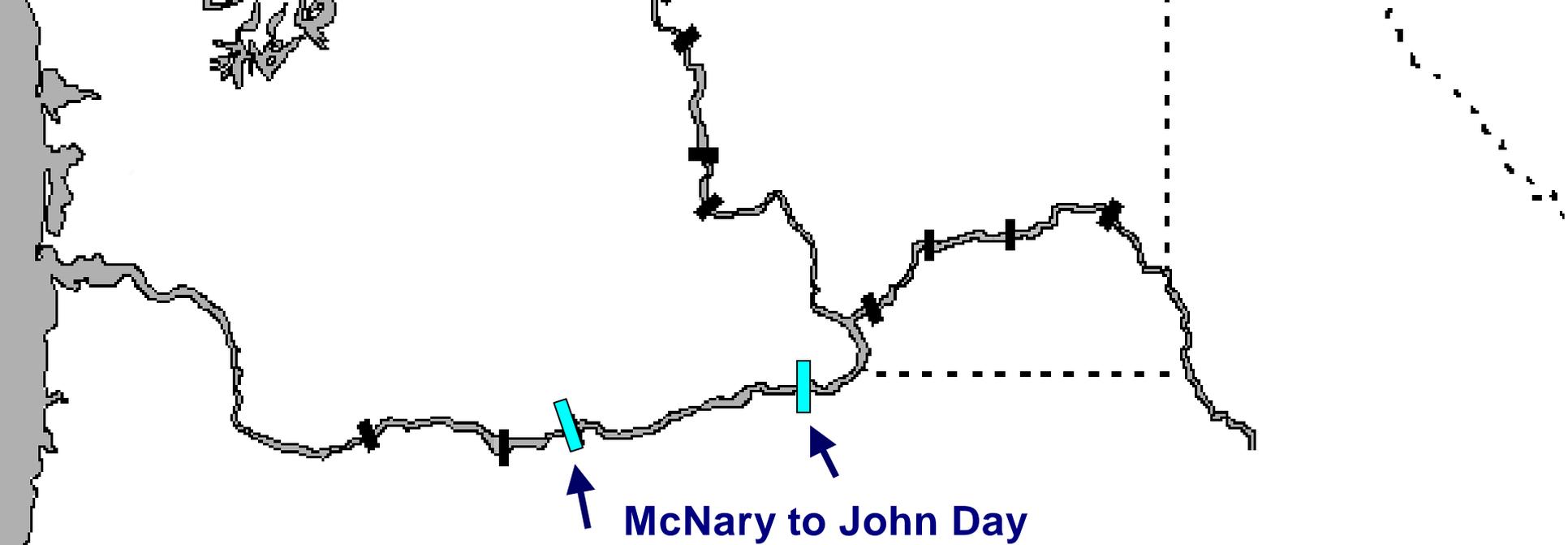




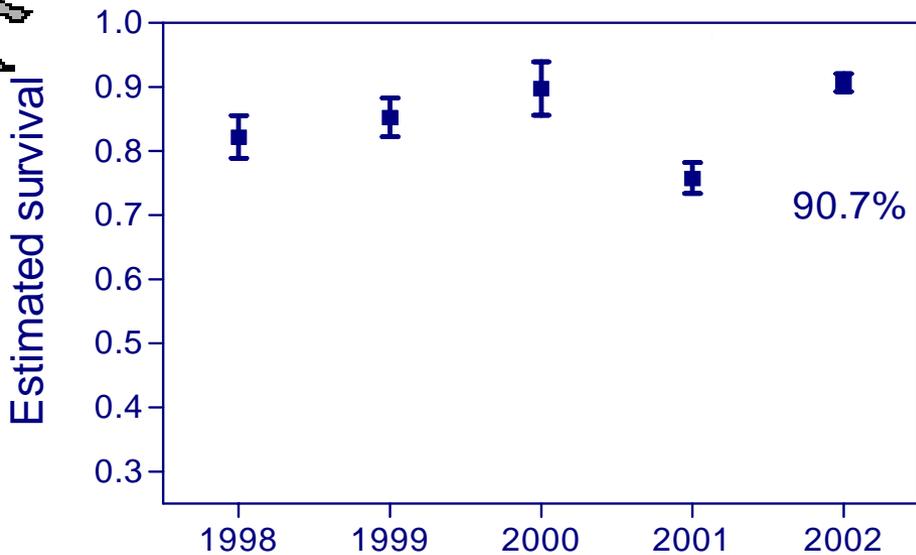


- > 12,000 PIT tags found in 2002
- 9.7% of steelhead leaving Lower Monumental Dam
- 1.5% of yearling chinook salmon leaving Lower Monumental Dam
- Not all tags are recovered

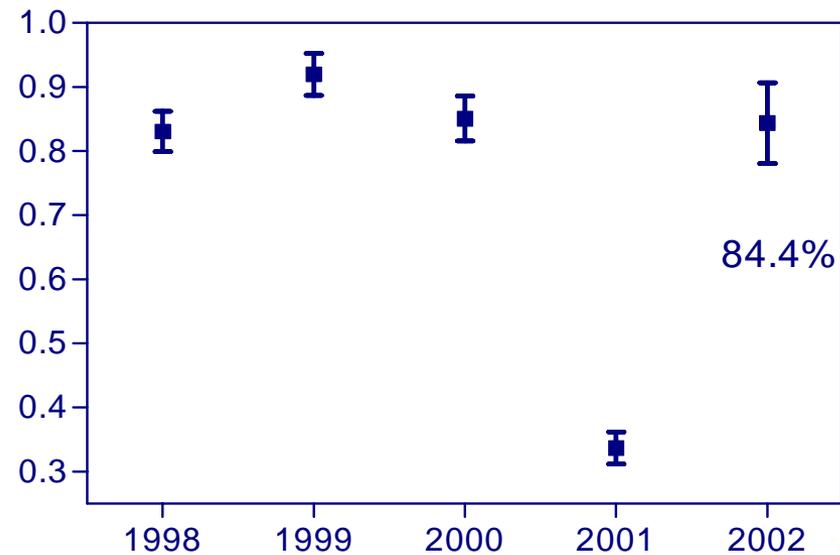


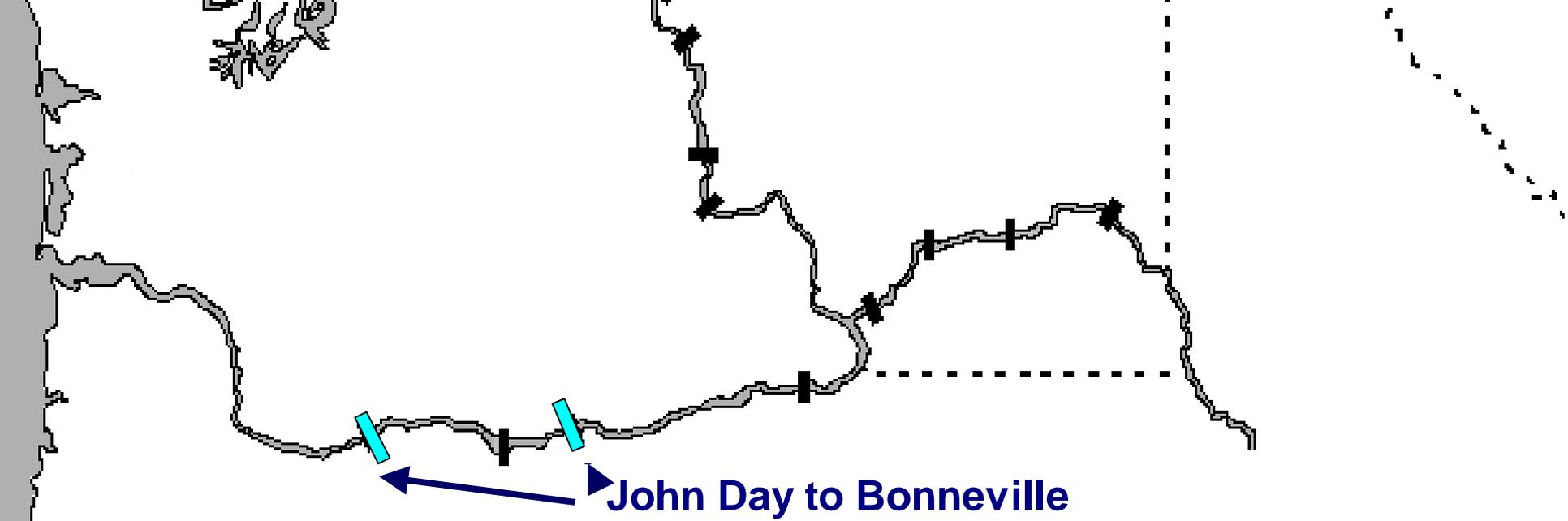


Yearling chinook

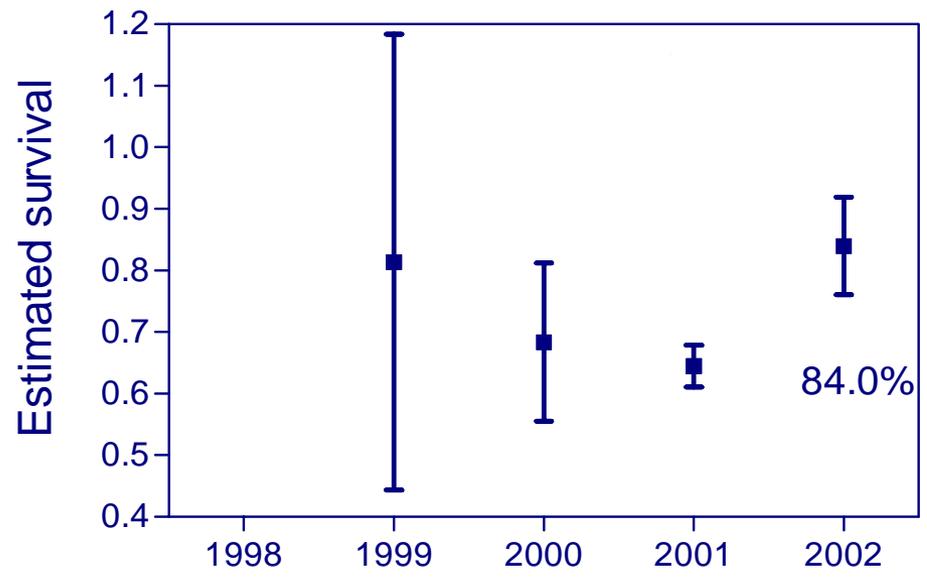


Steelhead

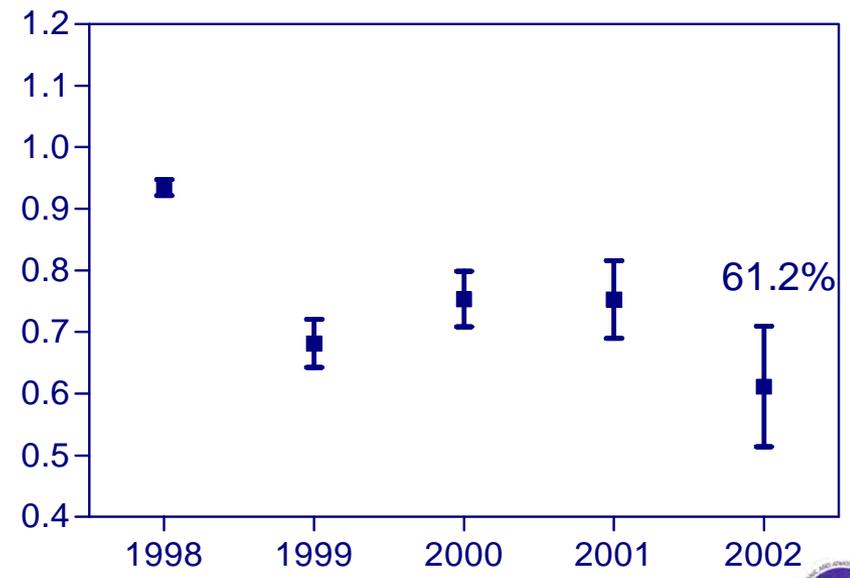


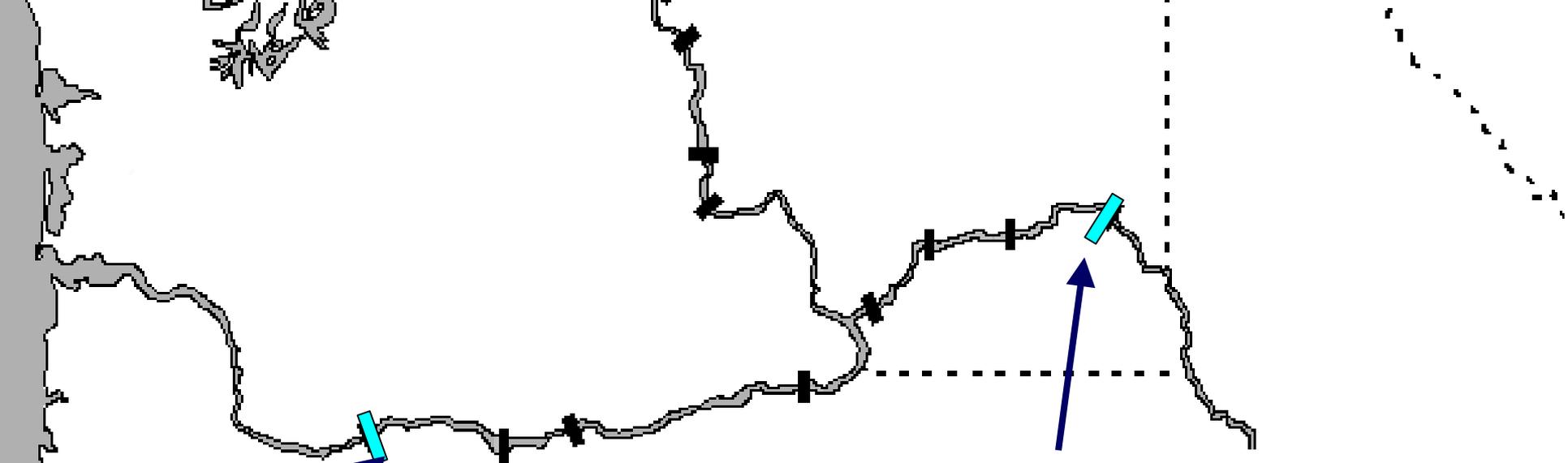


Yearling chinook



Steelhead

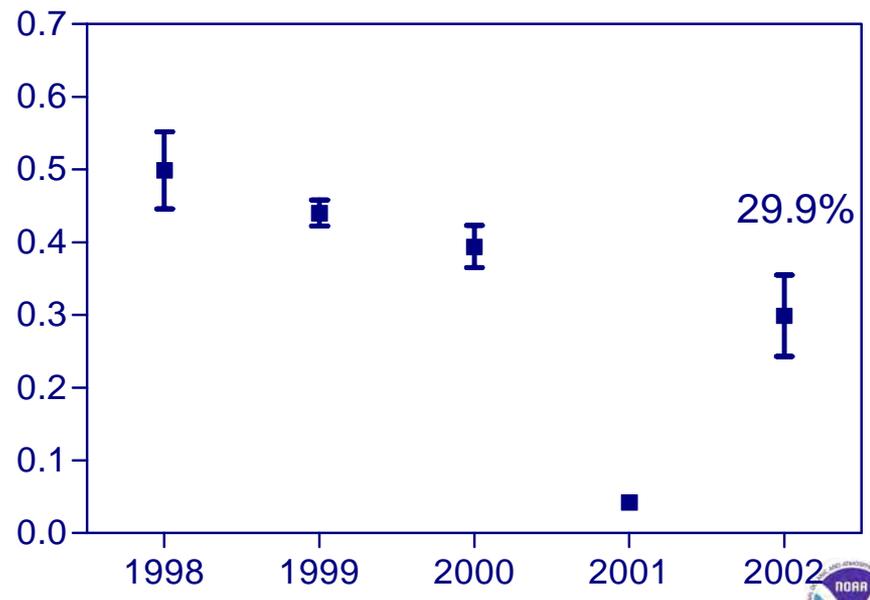
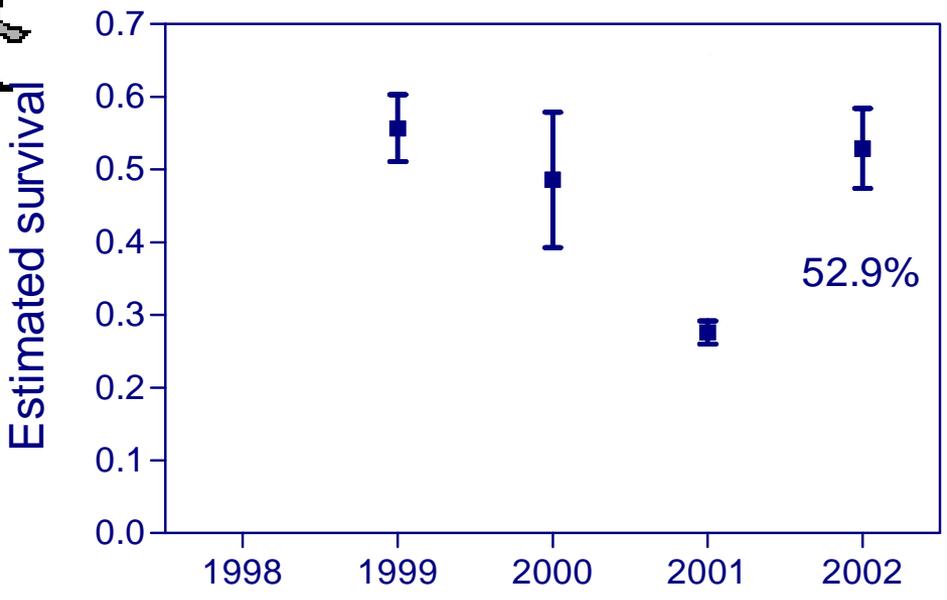


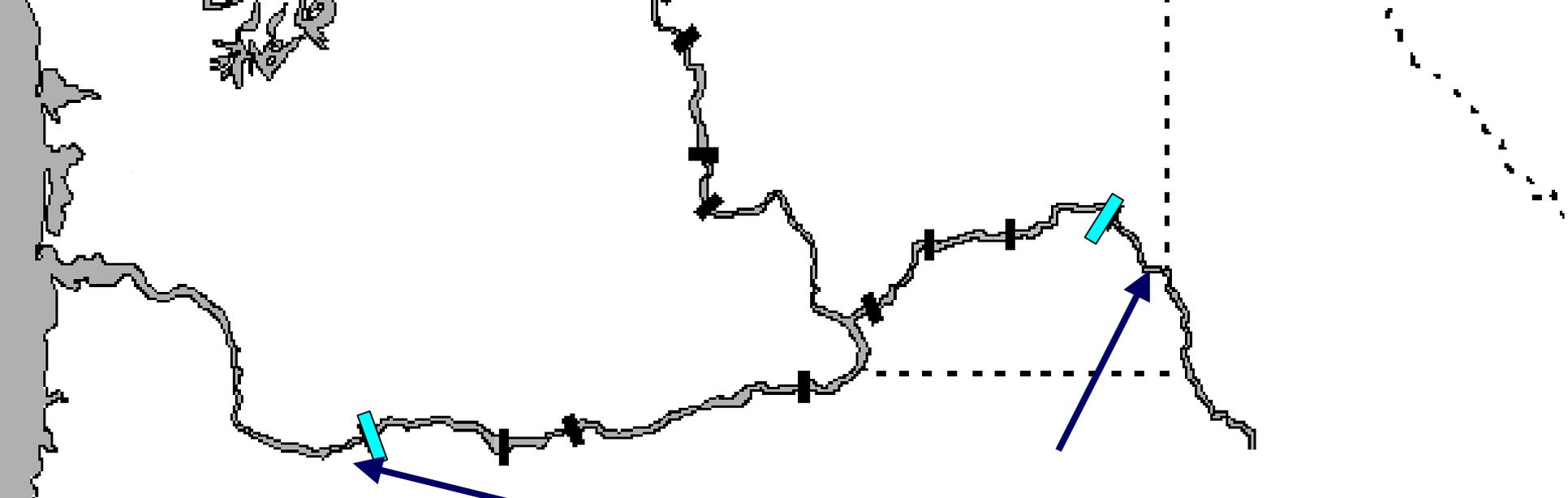


**Lower Granite to Bonneville**

Yearling chinook

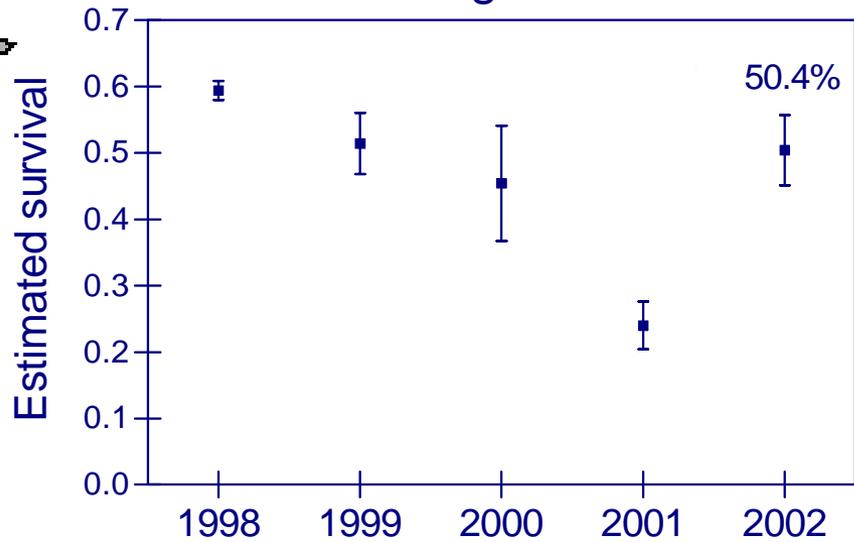
Steelhead



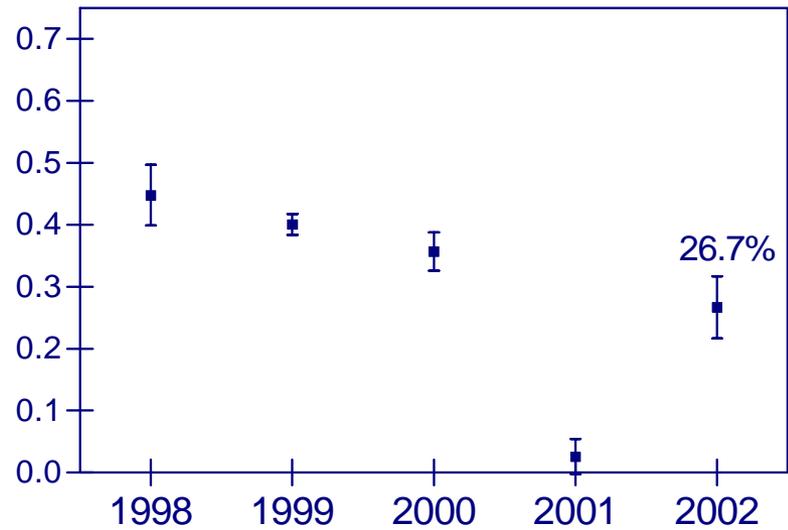


**Snake River trap to Bonneville**

Yearling chinook



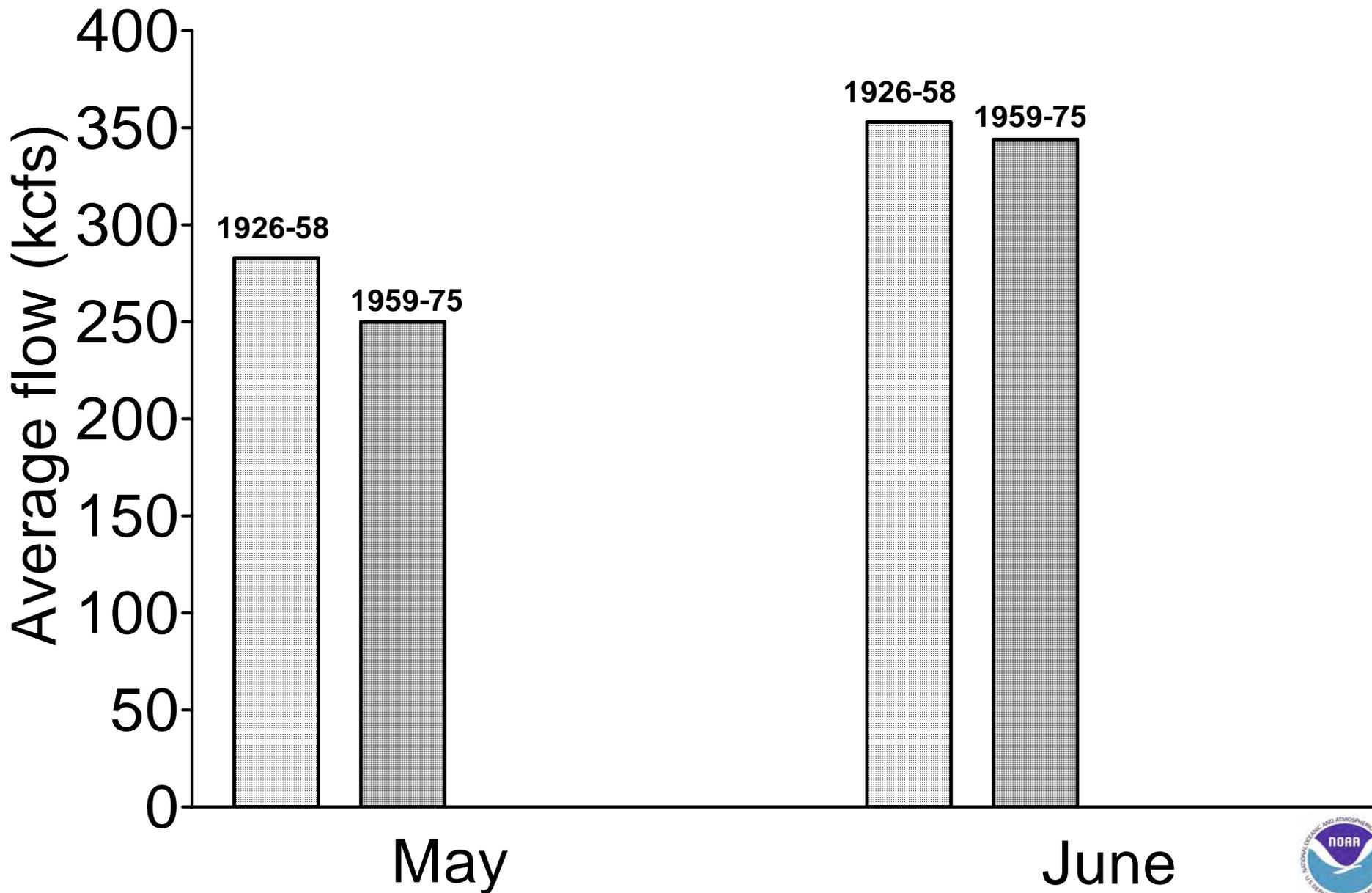
Steelhead



# Historic conditions

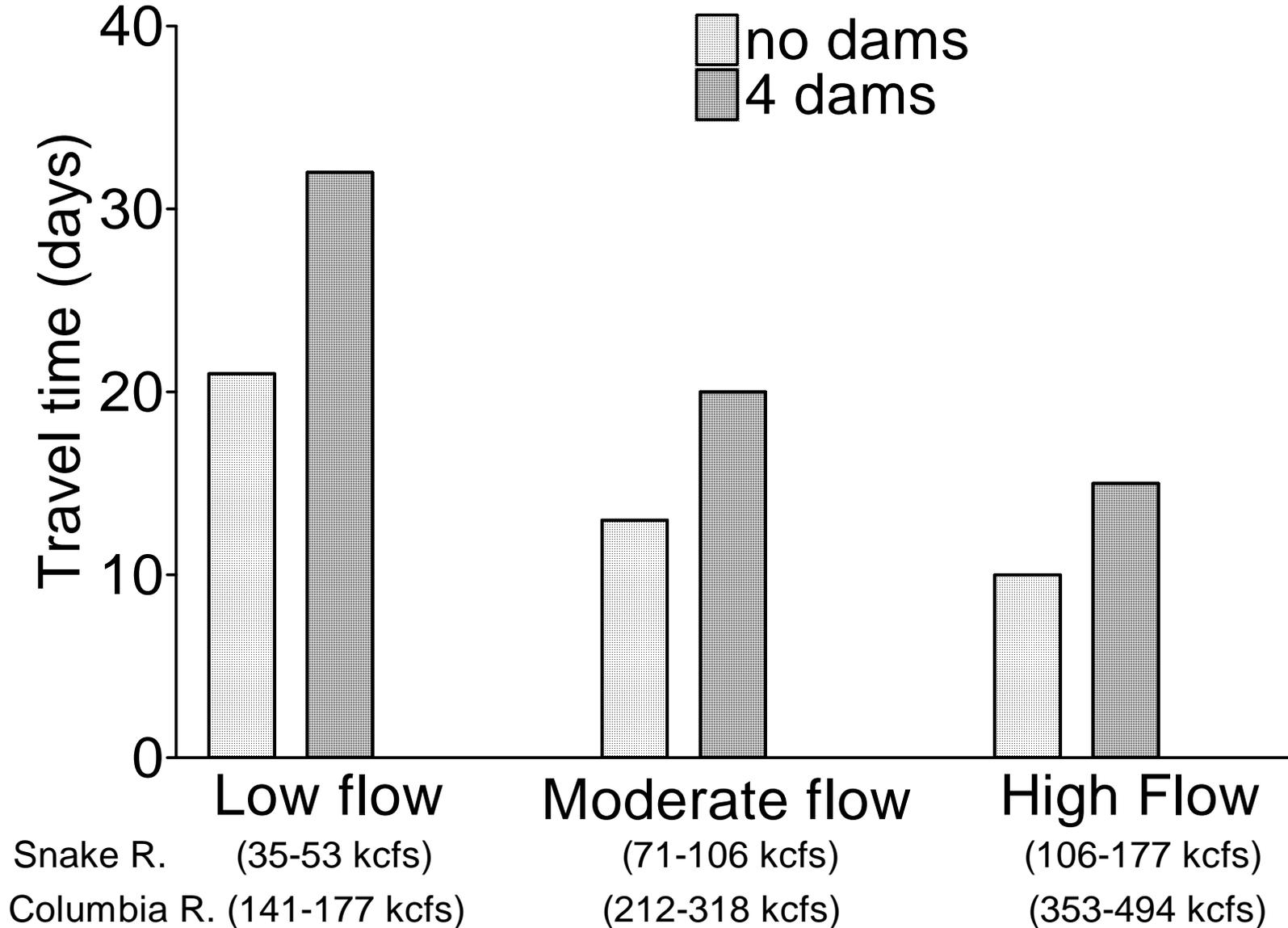
Salmonids evolved to migrate under flow conditions with a natural hydrograph. Due to the small size of smolts, the limited ability to store energy reserves, and the long distance they must travel, fish rely tremendously on flow (water velocity) to move them to the ocean.

# The Dalles Dam

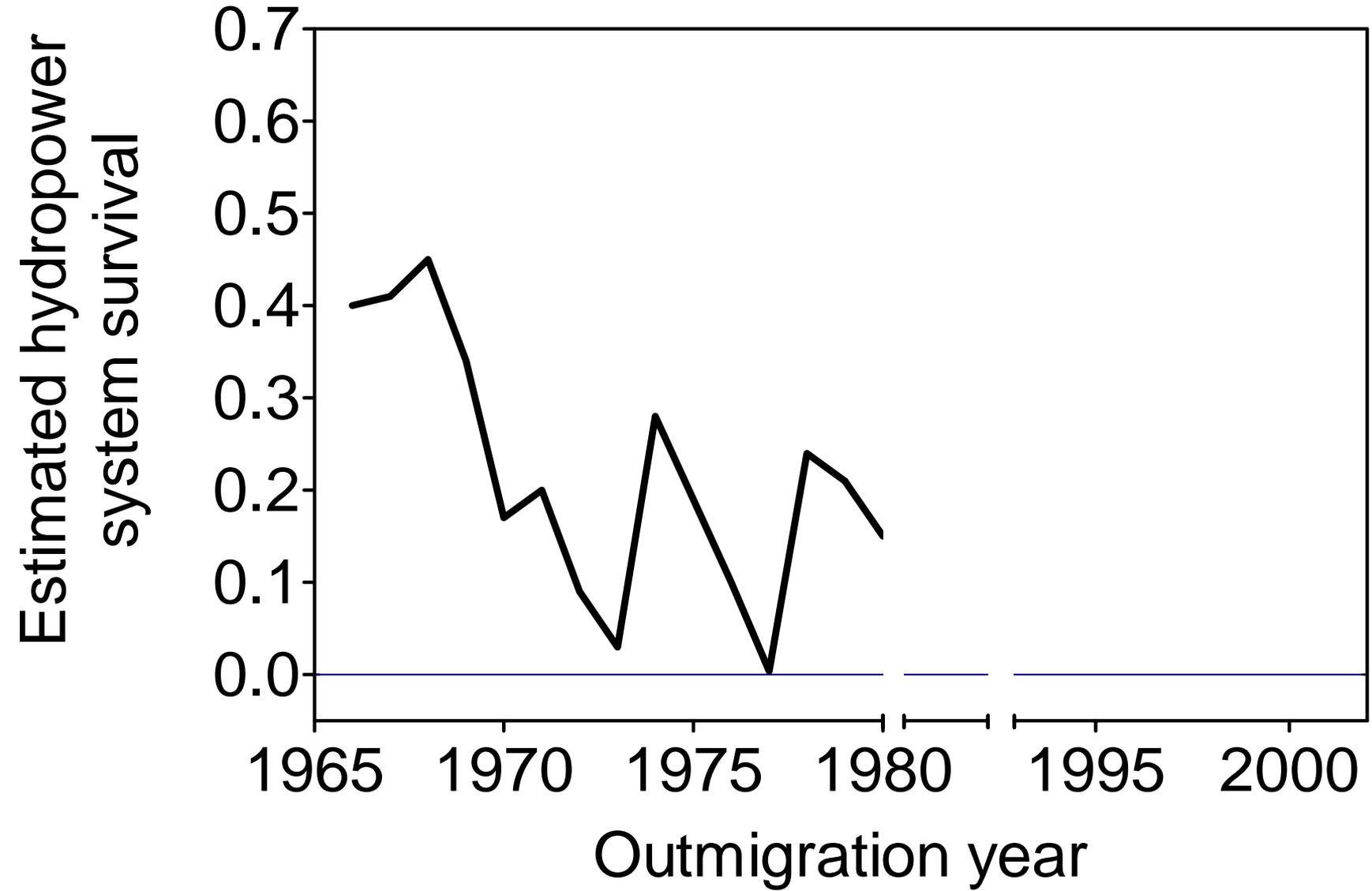


# Historic estimated juvenile chinook travel time from Lewiston to Bonneville Dam

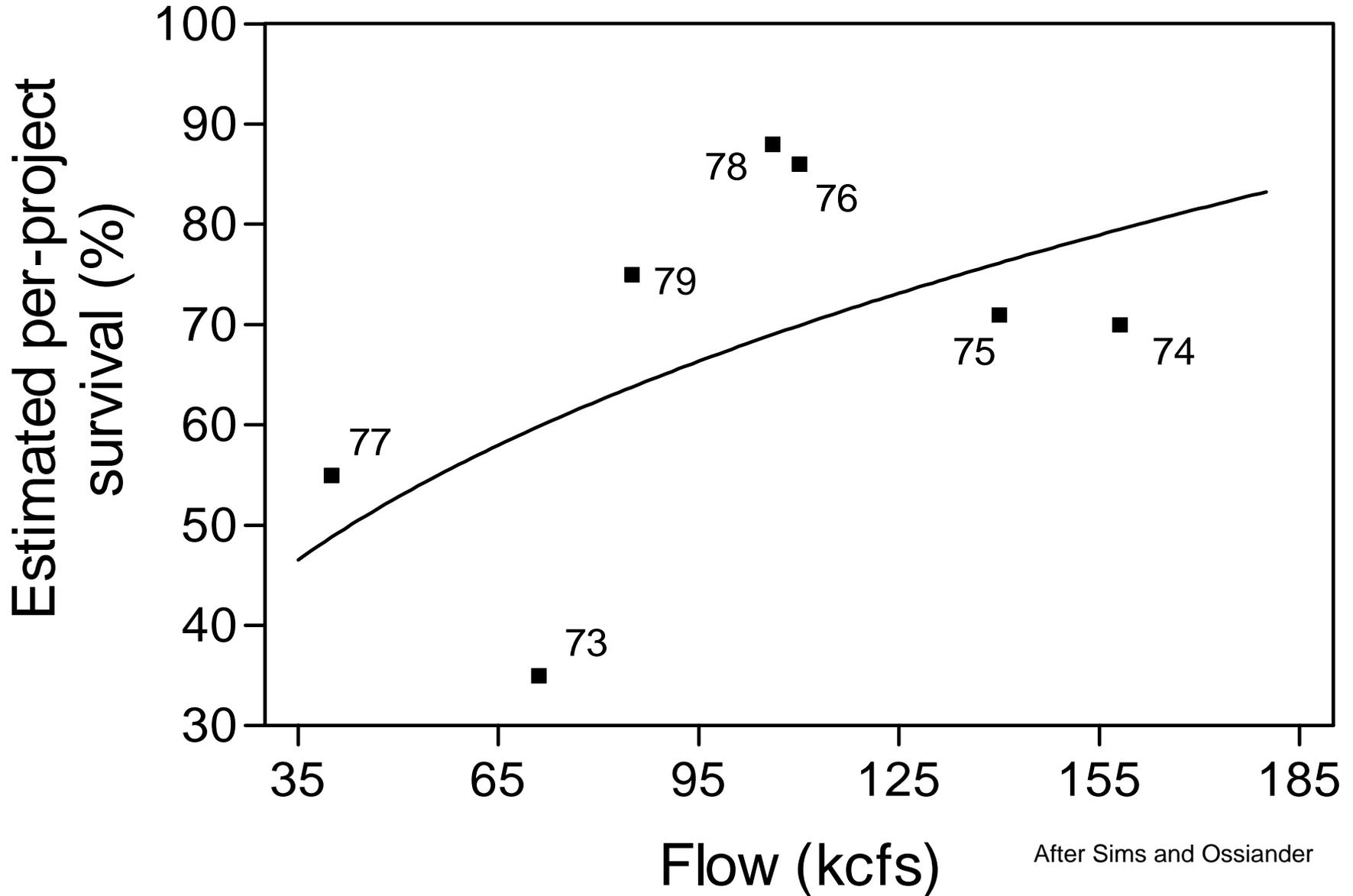
(after Raymond 1979)



# Snake River chinook salmon



# Snake River chinook salmon

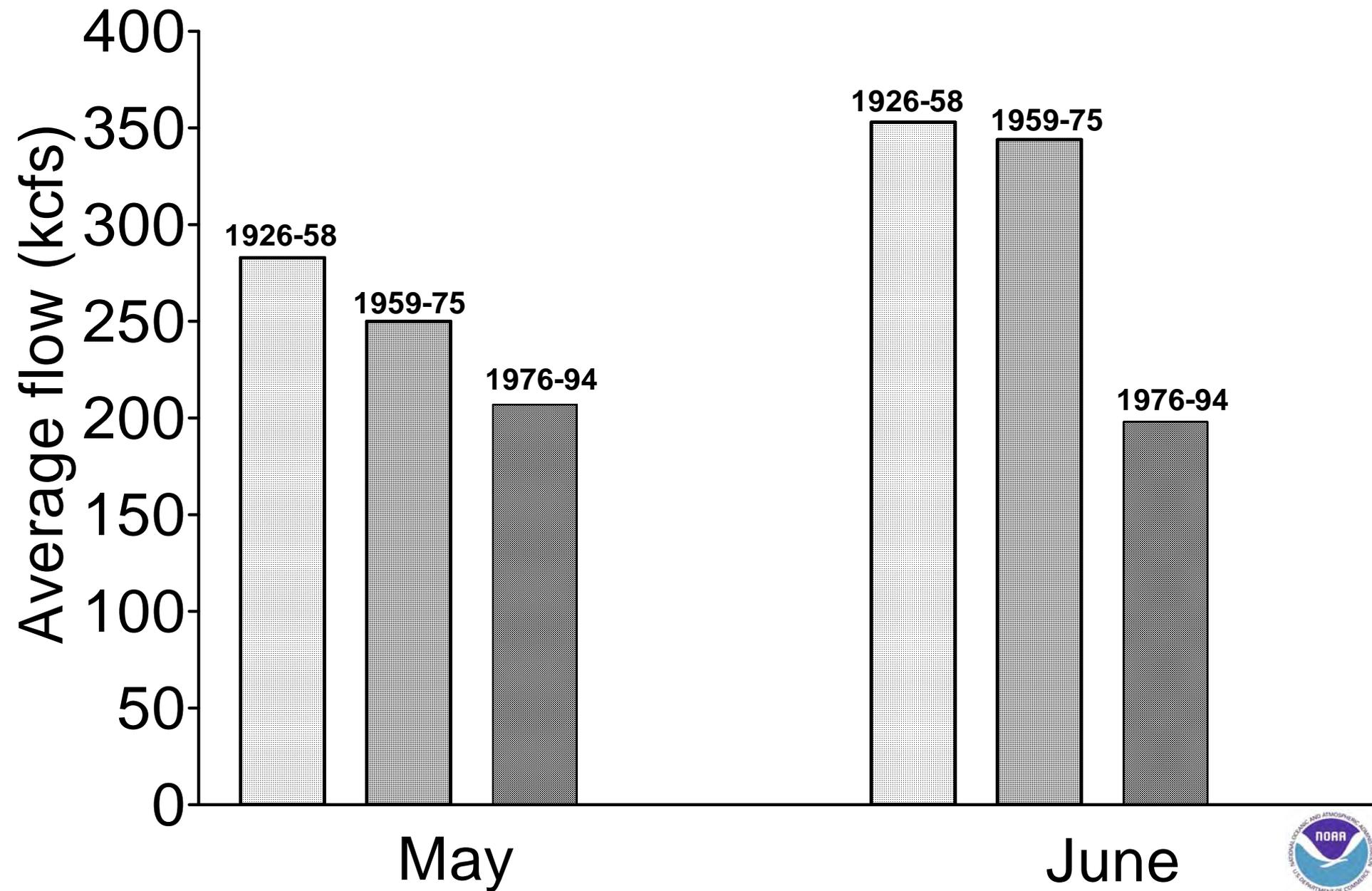


After Sims and Ossiander

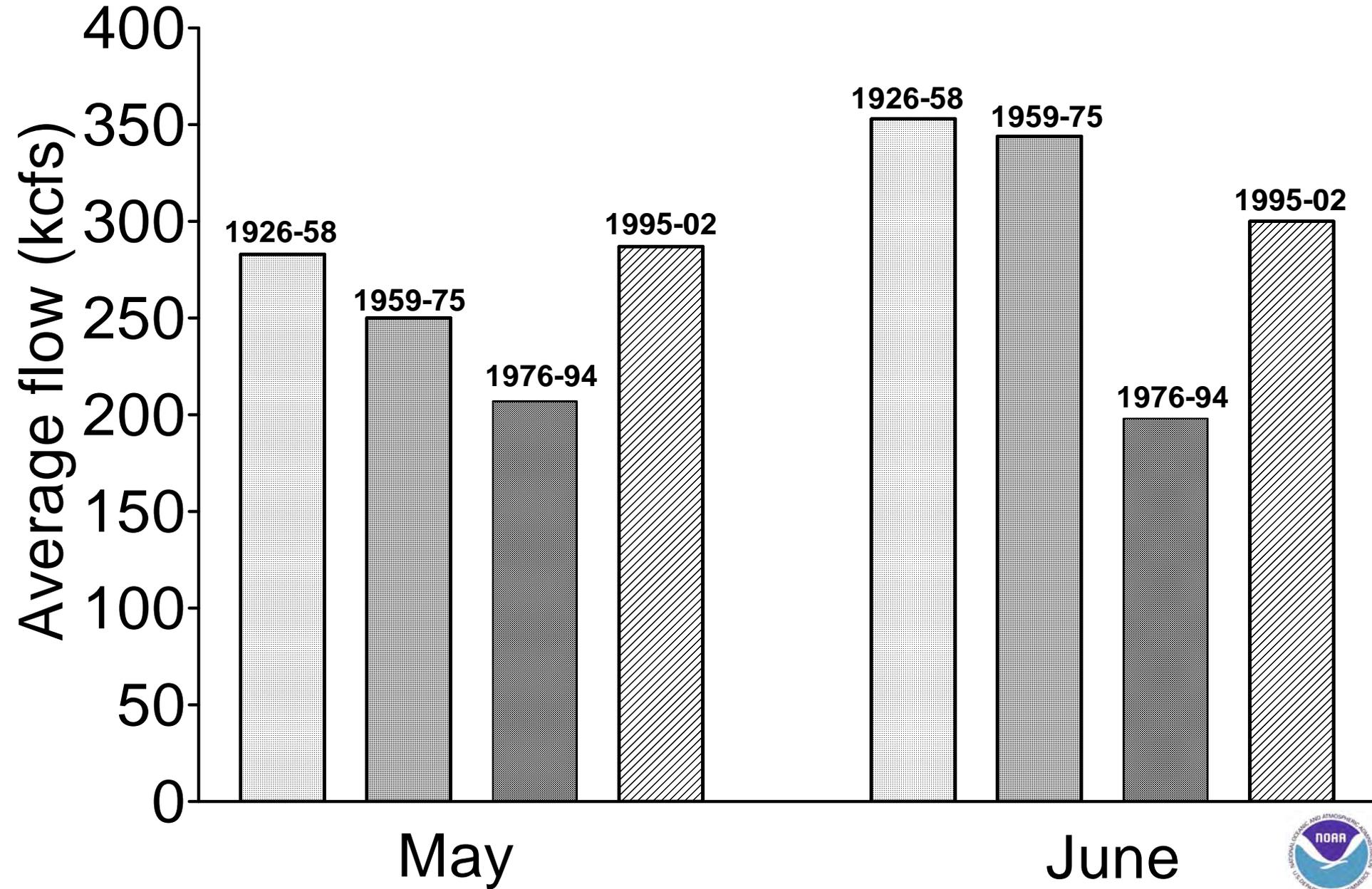


# Present conditions

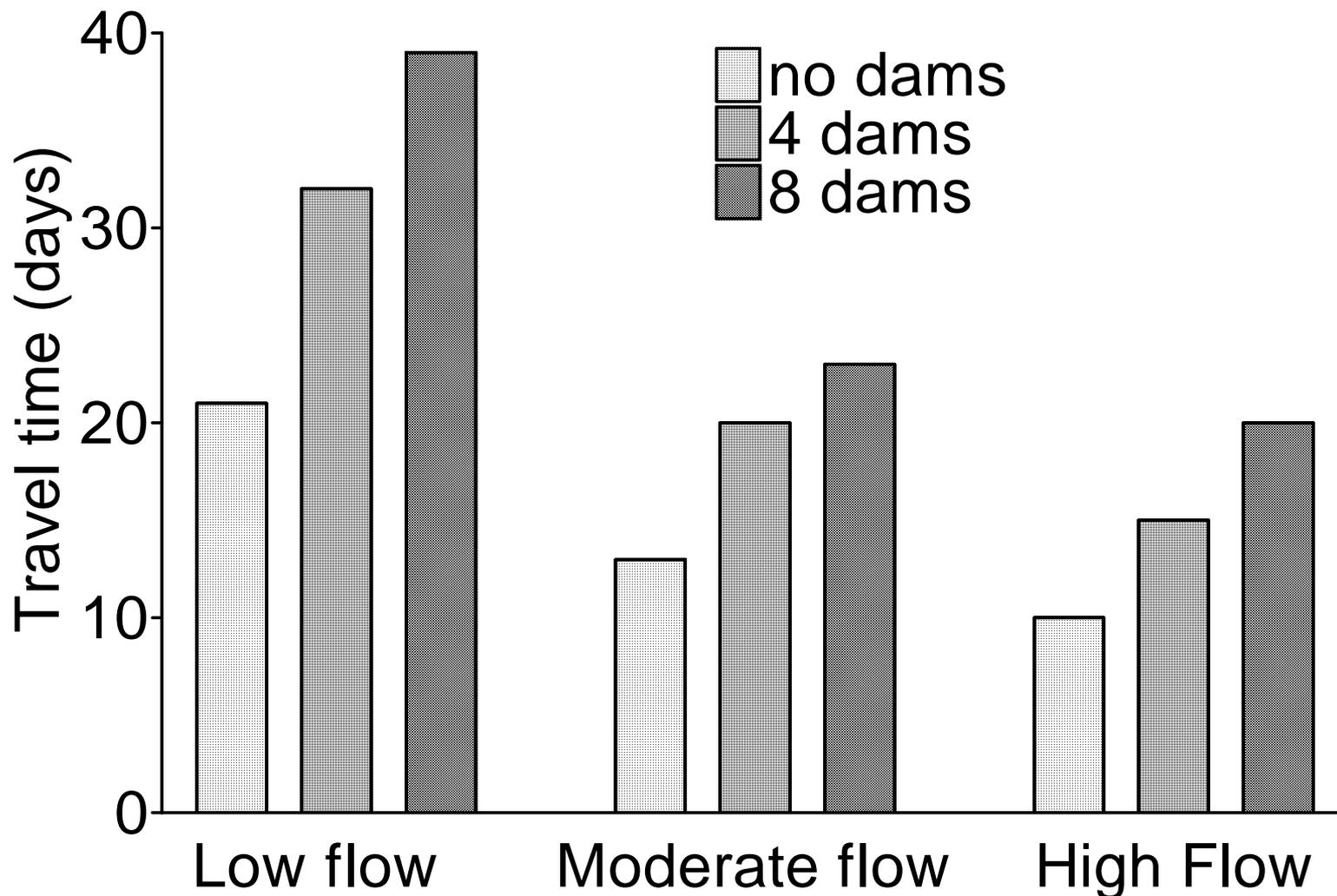
# The Dalles Dam



# The Dalles Dam



# Estimated yearling chinook travel time - Lewiston to Bonneville Dam



Snake R. (35-53 kcfs)

(71-106 kcfs)

(106-177 kcfs)

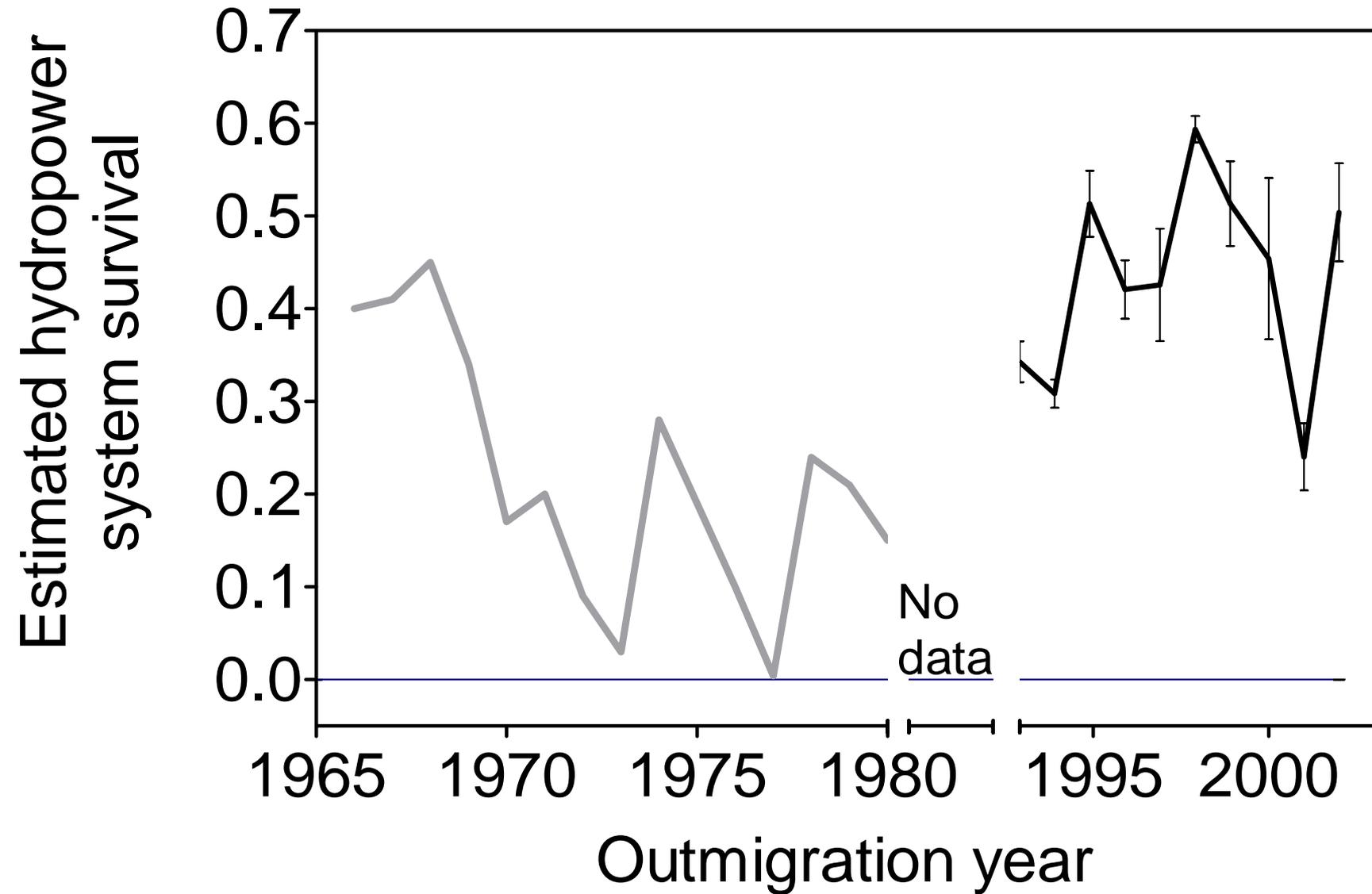
Columbia R. (141-177 kcfs)

(212-318 kcfs)

(353-494 kcfs)



# Chinook salmon

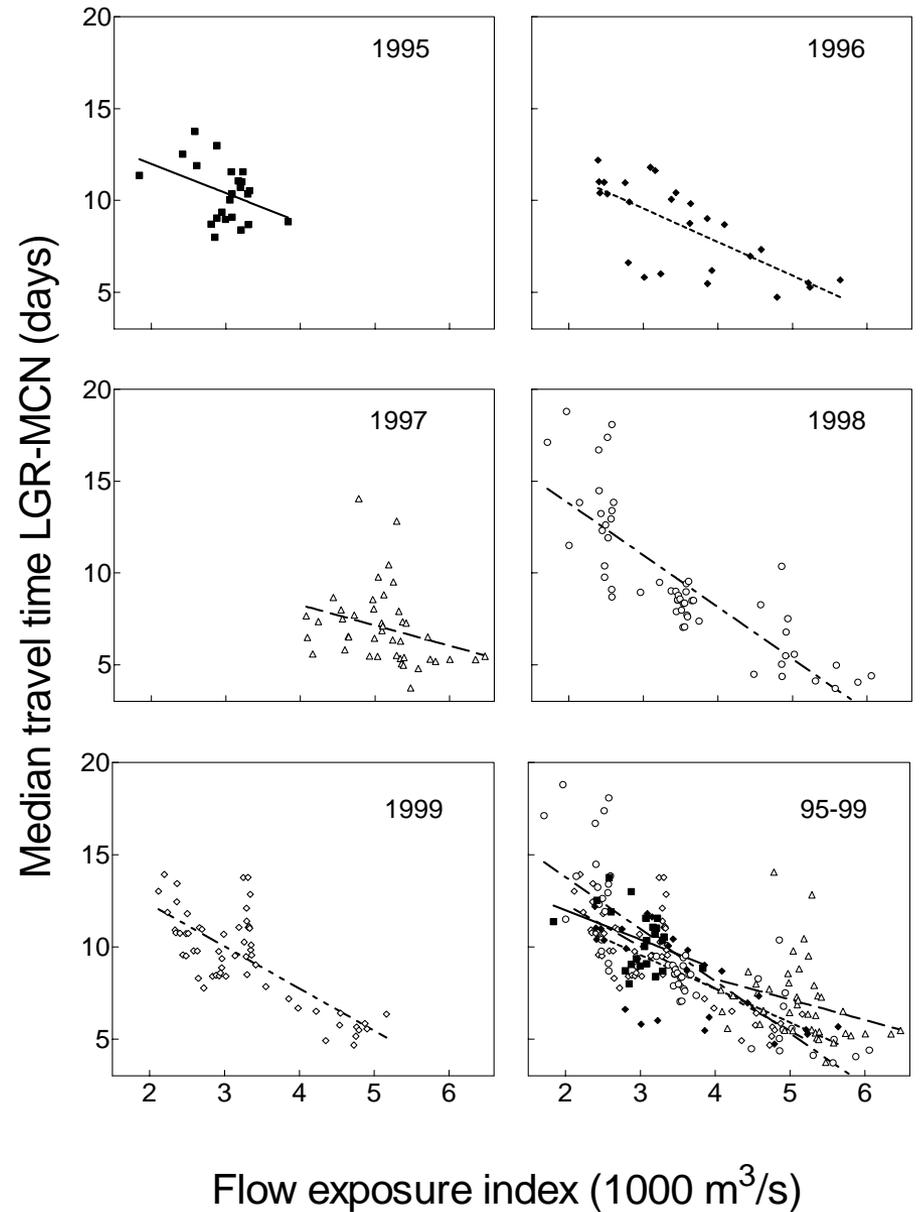
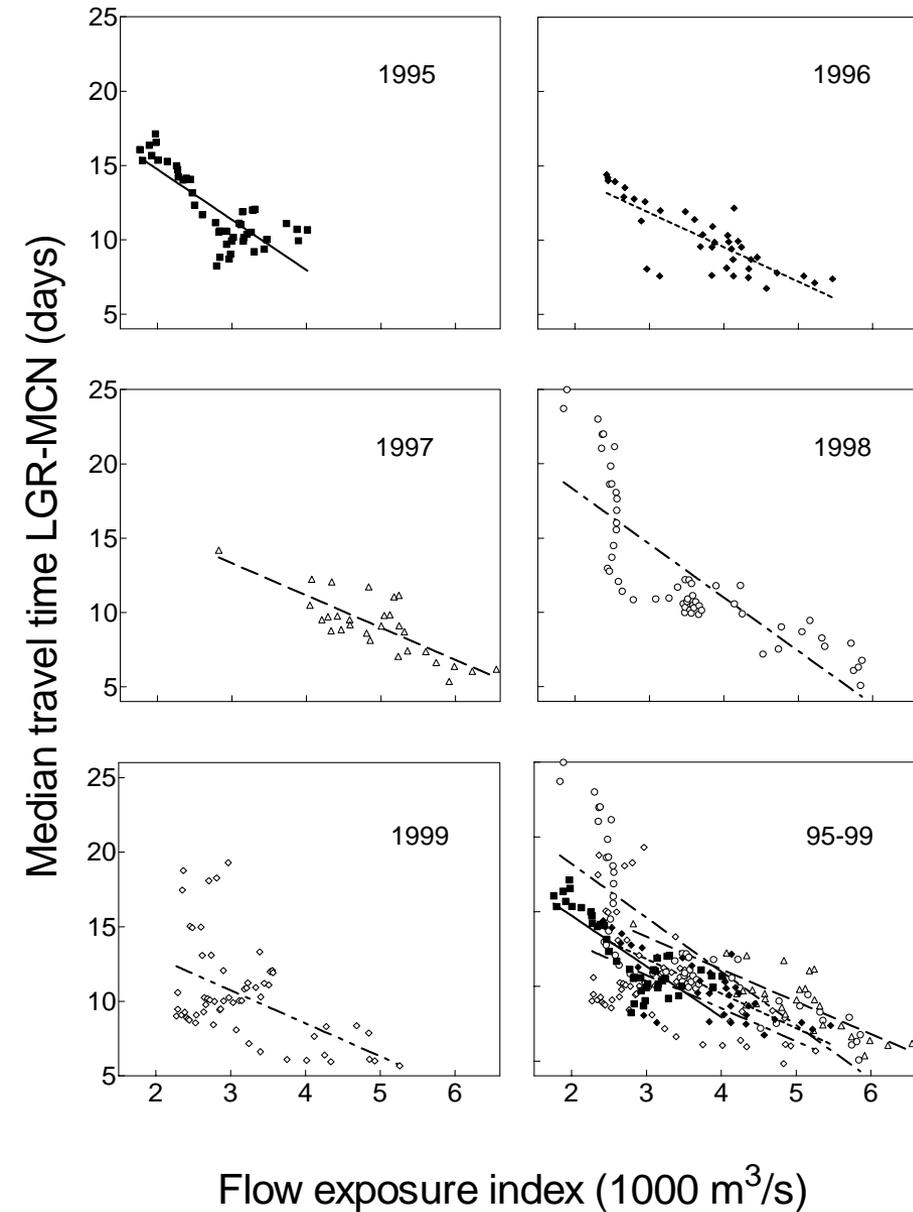


# Relations of Travel Time and Survival with Flow

**A strong and consistent  
relationship  
exists between flow  
(water velocity) and  
travel time**

# Yearling chinook salmon

# Steelhead

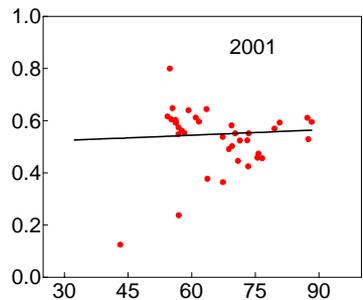
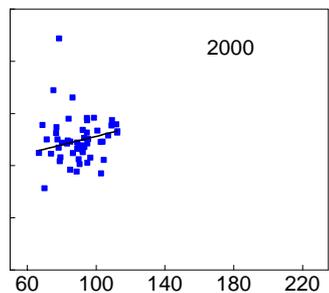
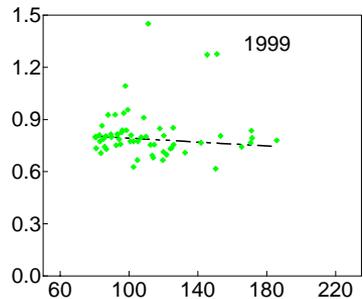
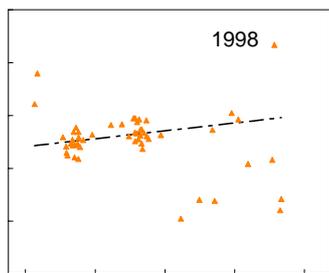
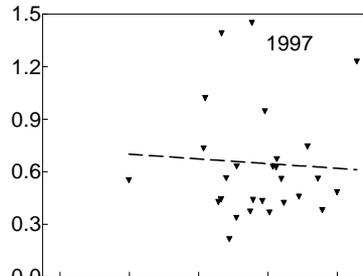
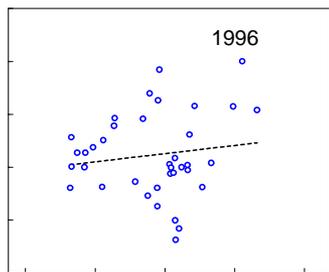
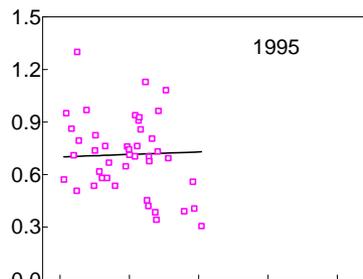


Travel time affects arrival to and through the hydropower system and thus, timing to the estuary and ocean.

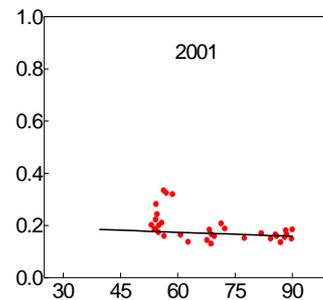
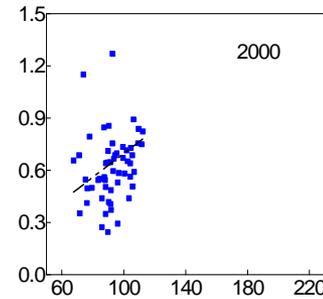
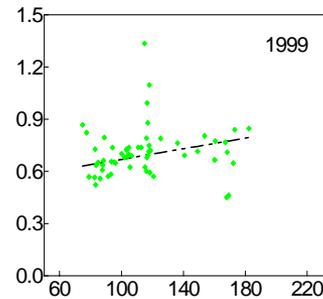
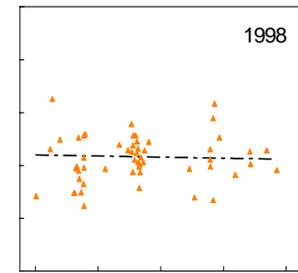
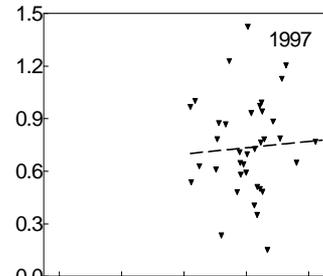
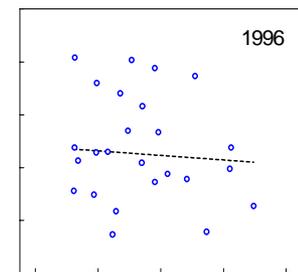
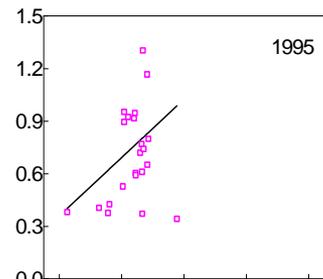
# Yearling chinook salmon 1995-2001.

# Steelhead 1995-2001.

Estimated survival probability LGR-MCN

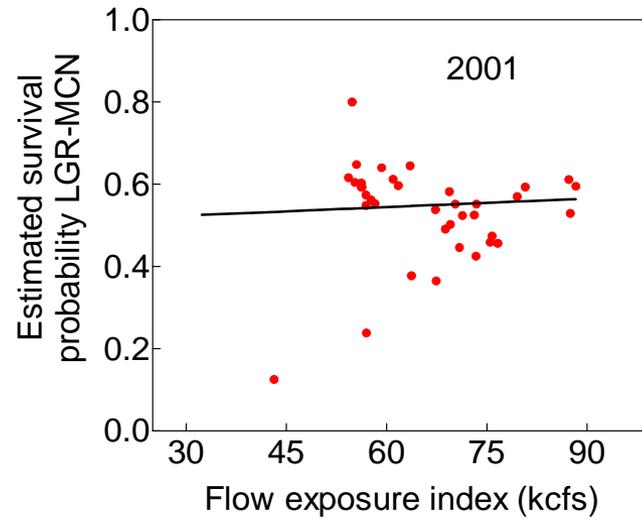


Flow exposure index (kcfs)

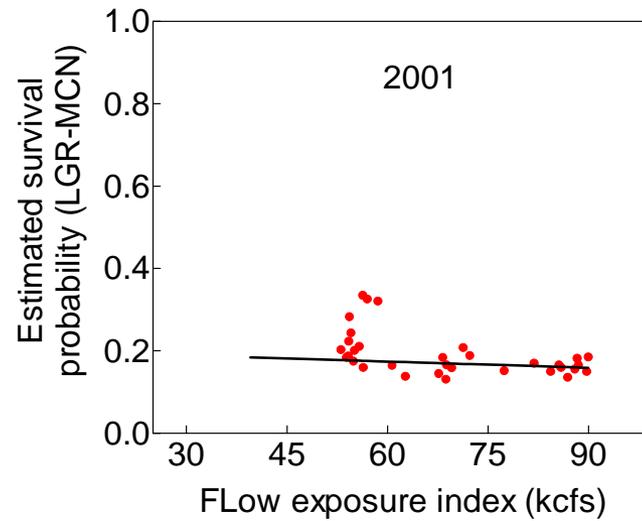


Flow exposure index (kcfs)

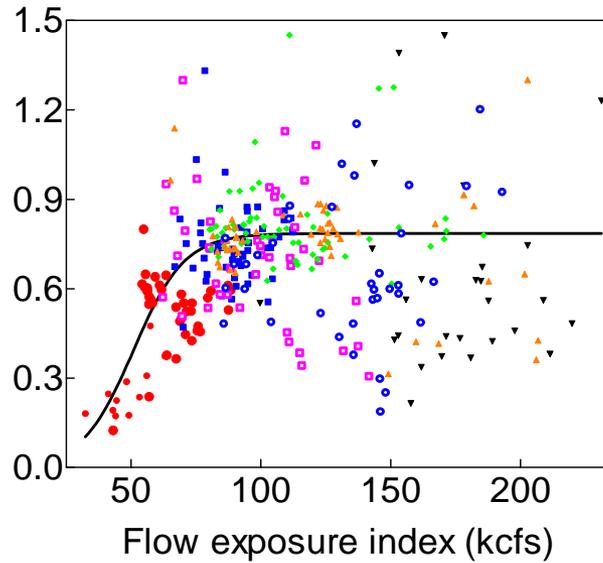
### Yearling chinook salmon



### Steelhead

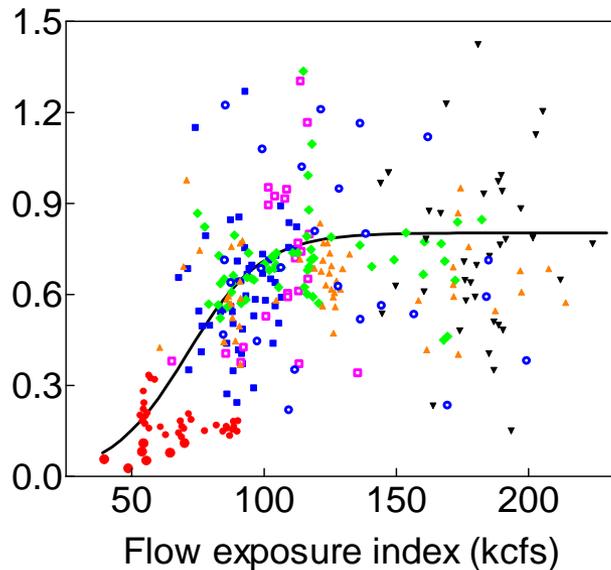


### Yearling chinook salmon 1995-2001.

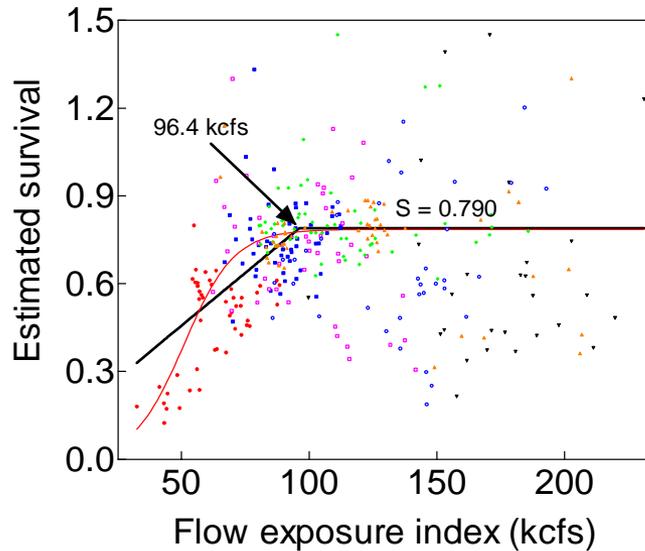


In 2001, little to no spill at all dams. In other years, spill to 2000 BiOp levels or to the gas cap.

### Steelhead 1995-2001.

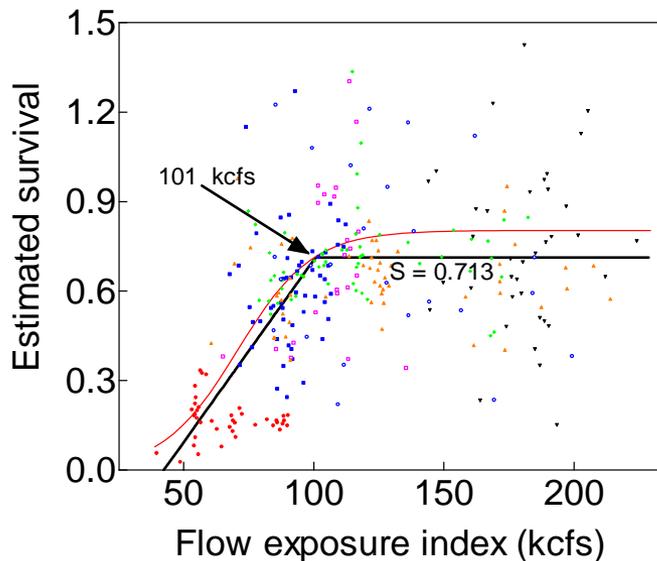


## Yearling chinook salmon 1995-2001.

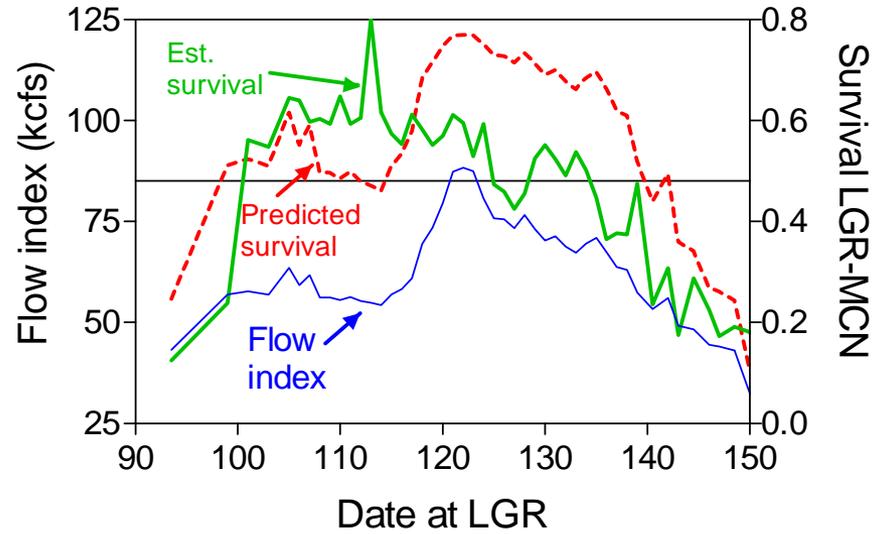


In 2001, little to no spill at all dams. In other years, spill to 2000 BiOp levels or to the gas cap.

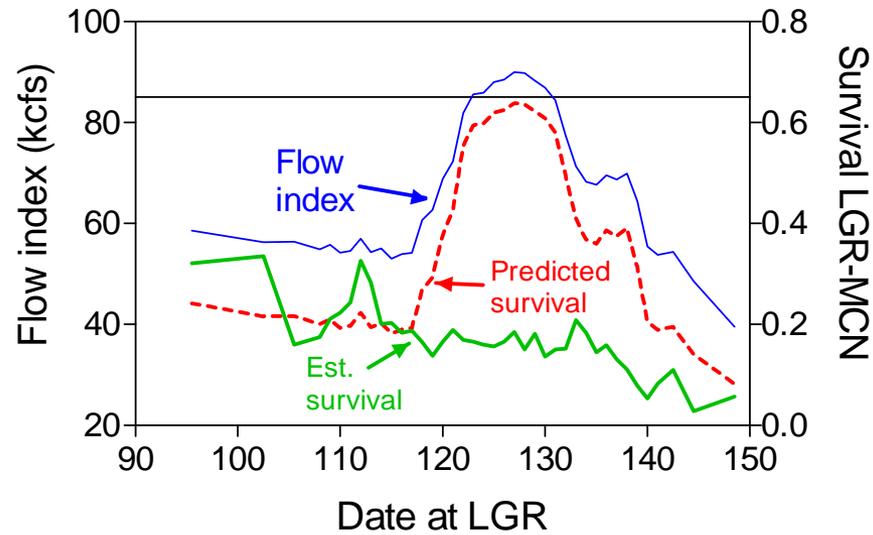
## Steelhead 1995-2001.



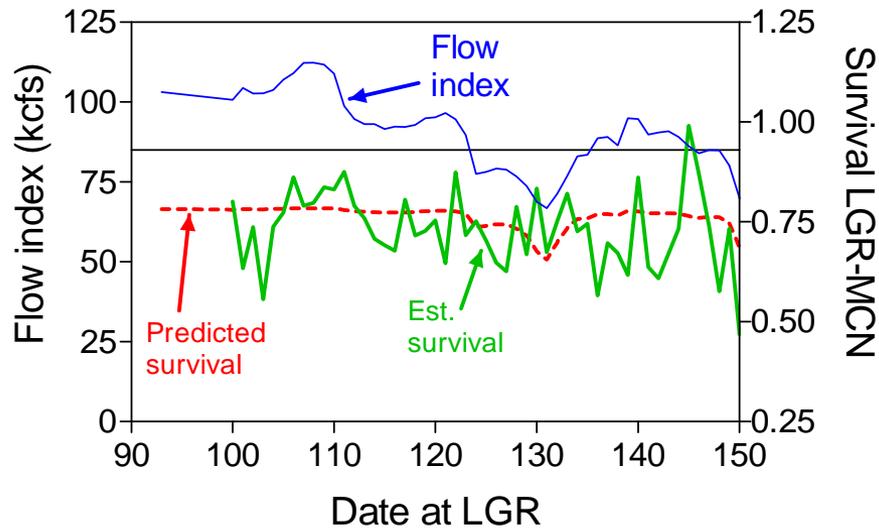
## Yearling Chinook 2001



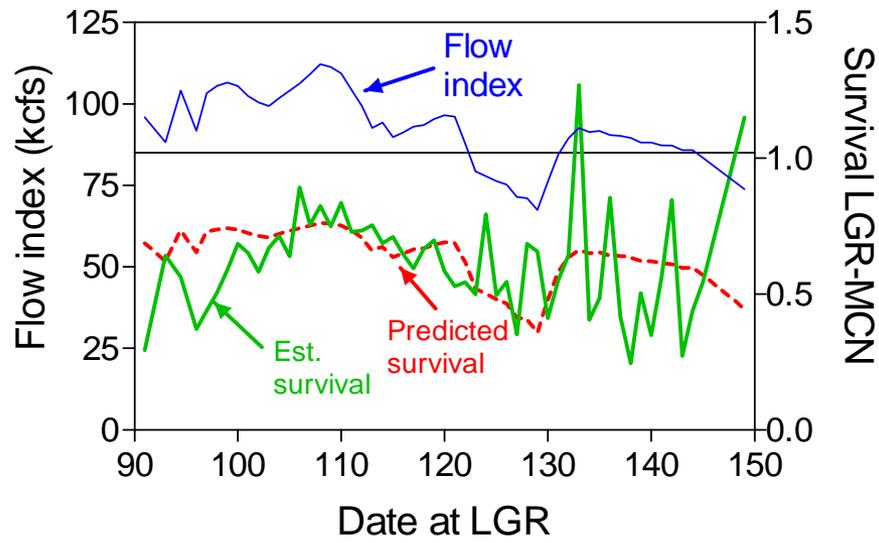
## Steelhead 2001



### Yearling Chinook 2000



### Steelhead 2000



- Above some threshold average survival appears to vary little, is relatively high, and does not correlate with flow.
- Below the threshold, survival is lower.
- Within migration season (2001), relationship between flow and survival did not follow curve fit to multi-year data.

# Conclusions – Spring Migrants

- Construction of dams has decreased water velocities and increased juvenile travel time.
- In low-flow years, juvenile survival decreases.

# Conclusions – Spring Migrants

- Lack of a strong flow survival relationship from LGR-MCN under generally good flow conditions is not surprising given the high estimated juvenile survival in this reach.
- Most losses from LGR-MCN occur from dam passage, leaving little mortality in the reservoirs where flow would affect survival the most.
- Lack of a strong flow/survival relationship in this short reach does not support an end to flow augmentation.

# Conclusions – Spring Migrants

- Adult returns vary widely depending on timing of the juvenile migration through the estuary and into the ocean.
- Presently, we cannot predict when favorable estuary/ocean conditions will exist.

# Survey of Ives Island Area

January 16, 2003

## Purpose:

- To evaluate the location of chum redd locations in the Ives Island Area during a 11.0-foot tailwater at the Bonneville Dam (BON).
- Agency biologists conducted a qualitative survey to assess the number of chum redds dewatered during a 11.0-foot BON tailwater.

## Attendees:

- Washington Department of Fish and Wildlife
- Oregon Department of Fish and Wildlife
- NOAA-Fisheries
- Bonneville Power Administration

# Survey of Ives Island Area

January 16, 2003

## Methods:

- Onsite observations were made from 10:00 AM to 12:00 PM
- WDFW and ODFW field biologists staff located chum redds
- The extent of dewatering and number of redds was then estimated

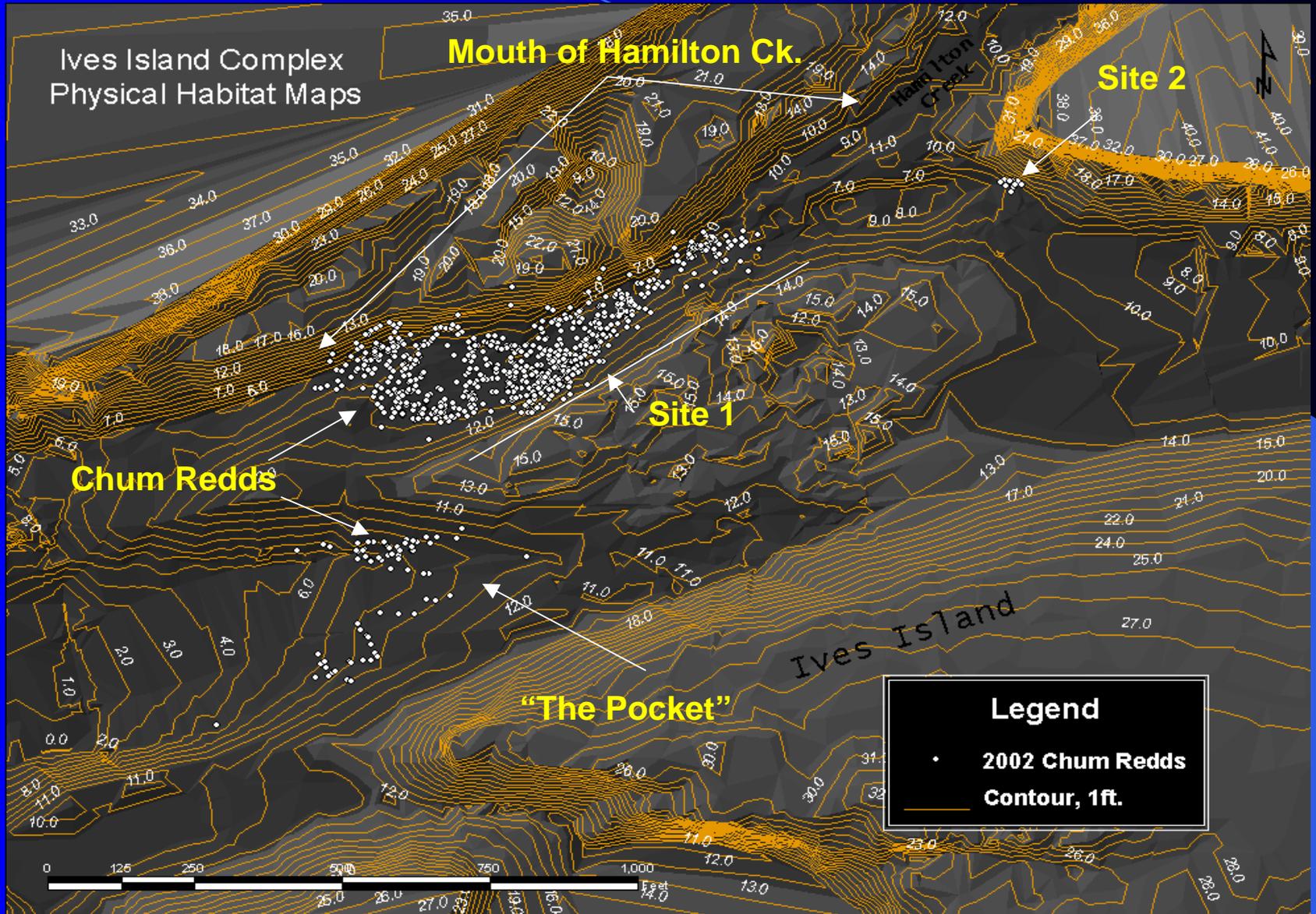
## Survey Conditions:

- Overcast and windy
- 11.0 to 11.1-foot BON tailwater according to the Tanner Ck. gauge ([www.nwd-wc.usace.army.mil/cgi-bin/DataQuery](http://www.nwd-wc.usace.army.mil/cgi-bin/DataQuery) )
- Hamilton Ck. Gauge elevation of 18.49 to 18.52'. (No flow estimate currently available.)

# Eastward View of Ives Island and Hamilton Ck



# USFWS Map of Chum Redd Locations



# Results of Survey

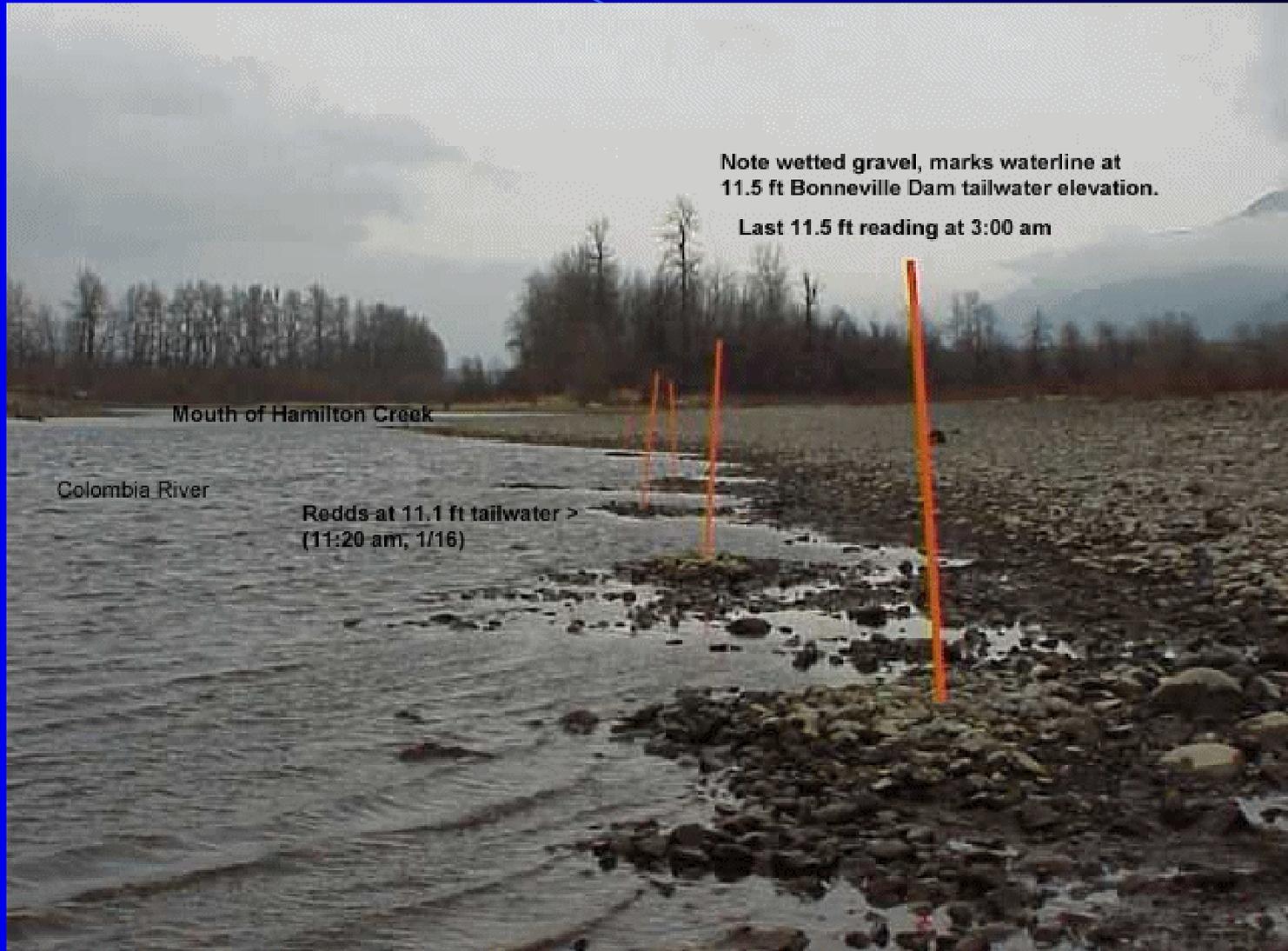
## Location of Chum Redds:

- Approximately 90% are located at mouth of Hamilton Ck. (Site 1)
- About 10% of the redds are located in “The Pocket”.
- About 6 redds are located at Site 2
- There are no chum redds located near Gauge 1

## Conclusion:

- Field staff estimated that approximately 1 to 2% of the redds in the Ives Island Area would likely be dewatered at a 11.0-foot BON tailwater.
- One redd was partially dewatered at McCord Ck. (OR) across the river from Ives Island.

# Mouth of Hamilton, Upstream View of Site 1



# Partially Dewatered Chum Redd, North End of "The Pocket"

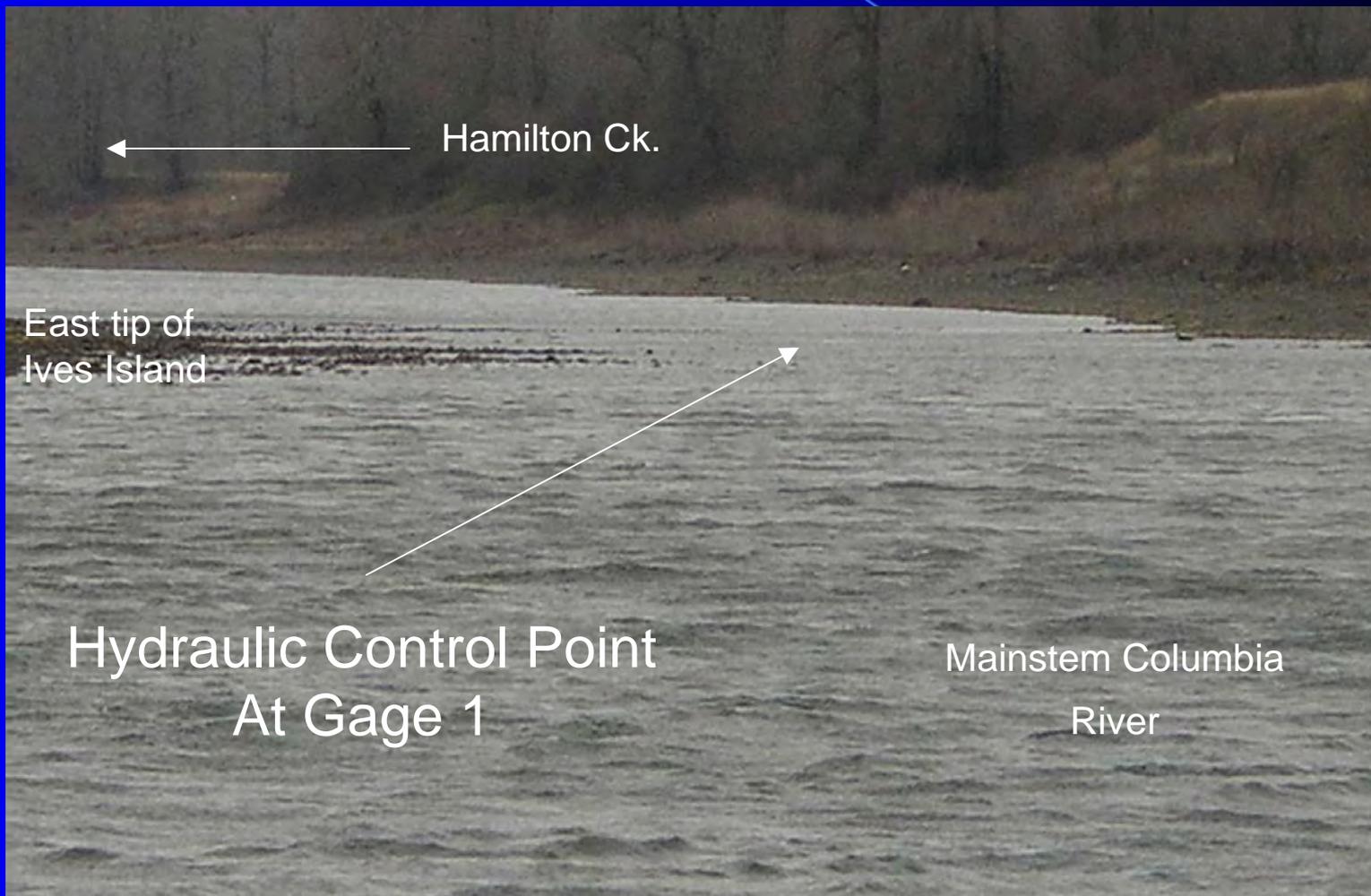


Chum Redd

# Partially Dewatered Chum Redd at Site 2



# Southeast View of Gage 1, from Mainstem 11.1-foot tailwater



# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / Steve Kerns

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT CONFERENCE CALL

24 January 2003      1300 - 1400 hours

Portland, Oregon

Conference call line: 503-808-5190

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnmv.net](mailto:dsilverberg@cnmv.net) or call her at (503) 248-4703.*

### AGENDA

1. Chum operations.
2. Set agendas for upcoming TMT meetings.

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

# COLUMBIA RIVER REGIONAL FORUM

## TECHNICAL MANAGEMENT TEAM

January 24, 2003

### FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Jacque Abel

#### Chum Operations:

Paul Wagner, NOAA Fisheries, began Friday's discussion acknowledging that this was a difficult issue for the Salmon Managers to address because there were many spawning chum this year and the operation will have a negative impact on chum redds below Bonneville dam.

Due to the low runoff forecast for this year and consistent with the Biological Opinion, NMFS presented a recommendation to operate the Bonneville tailwater at a minimum of 11' as a hard constraint and 11.2' as a soft constraint. The agency also recommended 70 kcfs flow to meet Vernita Bar.

Ron Boyce, Oregon, stated that the recommendation did not result from a consensus by the Salmon Managers. Oregon does not agree with the recommendation. The agency feels that there are other options to consider and that this operation forces a fish vs. fish situation that Oregon is not comfortable with. The agency will write a letter to NMFS stating its position on this issue and an explanation for that position.

It was clarified that NMFS recommended an 11' minimum AND 70 kcfs as hard constraints and interim operations. NMFS feels that these two factors will coincide and would like to reevaluate the operation at the next TMT meeting on February 5. It was also clarified that the goal behind this recommendation is to move water into storage.

The Action Agencies agreed to NMFS' recommendation and restated the operation that will occur: Bonneville will operate to meet at a minimum tailwater of 11.0 feet hard constraint and 11.2 feet soft constraint. The operation will be revisited by TMT at the next TMT meeting on February 5. This operation will be circulated as a teletype by RCC. The BOR voiced a concern that this operation will diminish the probability of meeting an April 10 refill at Grand Coulee, but agreed with the NMFS recommendation insofar as it targets meeting Vernita Bar and chum flows equally.

Oregon asked the Action Agencies if they could provide any certainty that the water stored now will later be used for fish. Steve Kerns, BPA, offered to report on any incidences when the tailwater goes above 11.2' and an explanation for the occurrence.

**ACTION:** Steve Kerns will provide daily reports on the BON tailwater and an explanation of any occurrences of the tailwater going above 11.2' at the next TMT meeting.

**Next Meeting, February 5<sup>th</sup>:**

**Agenda:**

- RFC Report on STP Model – Harold Opitz
- Chum Update
  - Field trip
  - Report on BON tailwater operations – Steve Kerns
- Review Current System Conditions
- Review Operations Requests
- Develop Recommended Operations
- Set Agenda for Next Meeting

**\*At the beginning of Friday's conference call, the group set meeting dates through March 2003. The regular TMT meetings will be held from 9-12 on Feb. 5 and 19, and March 5 and 19. There will also be a special TMT process discussion from 10-12 on Feb. 26 in the usual meeting room.**

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / Steve Kerns

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT CONFERENCE CALL

**30 January 2003      1400 - 1500 hours**

**Portland, Oregon**

**Conference call line: 503-808-5191**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnmv.net](mailto:dsilverberg@cnmv.net) or call her at (503) 248-4703.*

### AGENDA

1. Discuss [SOR # 2003-01](#), regarding tailwater elevation at Bonneville Dam to protect chum salmon.

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / Steve Kerns

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**5 February 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. Streamflow predictions - STP results (RFC).
3. Chum updates (WDFW, NMFS). [\[ODFW letter\]](#) (35kB) 
4. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - reservoir operation, power system, water supply (COE, BOR, BPA)
5. Review operations requests.
6. Develop recommended operations.
7. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**TECHNICAL MANAGEMENT TEAM  
MEETING NOTES  
February 5, 2003  
CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM  
HOUSE  
PORTLAND, OREGON**

**FACILITATOR’S SUMMARY NOTES ON FUTURE ACTIONS**

Facilitator: Donna Silverberg

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

**Stream Flow Predictions:**

Harold Opitz, River Forecast Center, continued his presentation from the last TMT meeting on the Single Trace Procedure (STP), a new forecasting model that the RFC is using. He stressed that this model is to be used for a 45-120 day period and is NOT intended for longer temporal periods. Its purpose is to be used as a step toward the ESP model. RFC’s hope is to “exploit” ESP capabilities by March 2003. Harold will discuss with other agencies how to present information and how the model could be used in lieu of the SAR model. Rudd Turner, COE, noted that this model could possibly be used this year to make decisions about spill at Snake River projects in the spring.

**Chum Updates:**

Ron Boyce, Oregon, provided a letter expressing Oregon’s concerns for the NMFS recommended operation from the January 24<sup>th</sup> TMT conference call, as promised. Ron will also distribute the letter electronically. Oregon’s main concern is how to account for stored water. Ron acknowledged some reprieve over the last few weeks, but would like to continue discussions about spring flows.

Scott Bettin, BPA, asked when this emergence will be complete in order to make more informed decisions for future operations. The objective remains to meet Vernita Bar without impacting Grand Coulee storage. TMT agreed that they will gather and share further information for discussion at the February 19<sup>th</sup> TMT meeting. Until then, the operation will remain as discussed during the 1/24 conference call.

Ron Boyce provided information on the Ive’s Island area. Two emerged frye were found on January 31<sup>st</sup> and a total of ninety emerged Chinook were recorded.

**Action:** Ron will arrange for a field trip to look at seining sites at the Ive’s Island complex, either later this month or in March.

**Current System Conditions:**

*Fish status:* Ron Boyce presented information from a joint Oregon/Washington report. A large adult Chinook return is projected. The information can be found on ODFW’s web site.

Reservoir operations: Rudd Turner, COE, and Tony Norris, BOR, reported on each of their projects. Dworshak is at 1541.2' and still operating under flood control. Grand Coulee is full. The runoff forecast for Brownlee is still very low, at 56%.

**Other:**

Spring/summer Update: The COE will draft a Spring/Summer Update to the WMP when the final February water supply forecast is released. The agency hopes to present the update to TMT at the Feb. 19<sup>th</sup> meeting. **If anyone has additions or changes to the update, please contact Rudd Turner or Scott Boyd before the 2/19 TMT meeting.**

Lower Granite/McNary/Lower Monumental: Rudd Turner reported on work that is occurring at each of these projects. A surface bypass collector is scheduled to be removed by April 1 at Lower Granite. This issue will be revisited at the next TMT meeting. There will be a RSW test at Lower Granite in the spring – details to follow. Gate hoist tests at McNary were scheduled to begin today. Water quality standards may be exceeded; the COE is coordinating with Oregon and Washington on this. Construction at the Lower Monumental spillway will continue until the end of February.

**Next Meeting, February 19, 9-noon:**

Agenda Items:

- Chum Emergence Data
- Water Management Plan Spring/Summer Update
- Q Adjust – February Finals
- Current System Conditions
- Review SOR's
- Develop Recommended Operations

***1. Greeting and Introductions***

The February 5 Technical Management Team meeting was chaired by Rudd Turner of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Turner at 503/808-3935.

***2. Streamflow Predictions – STP Results.***

Harold Opitz described the River Forecast Center's new Single-Trace Process (STP) for predicting weekly streamflows in the Columbia Basin, noting that it relies on current and historical data (dating back to 1948) from more than 350 individual basins in the region to produce its model runs. The River Forecast Center feels STP offers a number of advantages over the old SSARR model; Opitz said the RFC will begin posting the STP runs to its website in early March; if he can complete data input to the model in time, STP will replace SSARR as the primary streamflow modeling tool this spring. Opitz spent a few minutes describing how STP works and demonstrating its capabilities.

Opitz noted that, based on the most recent forecast information, precipitation will need to be 165% of normal between now and July 1 if Columbia Basin runoff volumes

are to approach normal in 2003. Based on the historic record, he said, this will be difficult, if not impossible, to achieve, although that is not to say the water supply forecast will not improve over the course of the spring. In response to a question, Opitz said the STP forecast extends 45 days into the future.

### ***3. Chum Update.***

Ron Boyce began this agenda item by distributing copies of a February 4 letter from ODFW and the U.S. Fish and Wildlife Service to BPA, the Bureau of Reclamation and the Corps. He explained that the letter lays out salmon manager concerns about the potential impact of any reduction in the Bonneville tailwater elevation on chum incubation and rearing in the Ives/Pierce Island areas. The letter is intended as a formal review of the salmon managers' concerns, said Boyce; it is not our intent to elevate this issue to the IT at this time, given the fact that there appears to be plenty of water in the system to maintain the current tailwater depth, currently. However, the long-term forecast indicates that, eventually, the chum operation will begin to impact Grand Coulee elevations, said Boyce; at that point, we will need to have additional discussions about this operation. Boyce said the salmon managers are continuing to discuss this operation, and will provide some further information at the February 19 TMT meeting.

Boyce added that field crews have begun seining for chum fry at a number of sites in the Ives/Pierce Island area, looking for signs of emergence; however, no fry counts are available at this time due to high water elevations over the redds. I'll continue to update the TMT on emergence as more information becomes available, Boyce said. The group also discussed a potential TMT field trip to the Ives/Pierce Island spawning area, probably some time in March.

### ***4. Current System Conditions.***

Boyce began with information on the 2003 adult return forecast, noting that the predicted run of 109,000 spring chinook in the Willamette is the third-highest on record. The current estimate for the Snake River spring chinook run is 145,400 fish, plus 87,600 fall chinook. The estimated 2003 sockeye run of 22,100 is the sixth-lowest on record, Boyce said.

Moving on to current system conditions, Turner said the current flow at Bonneville is 194 Kcfs, with an 18-foot tailwater elevation. Dworshak is currently at elevation 1541.2 feet and filling. The current elevation at Libby is 2408.2 feet; the project continues to release minimum discharge. Albeni Falls is essentially full, at elevation 2059.9 feet. Tony Norris added that Grand Coulee is full and releasing 89.2 Kcfs; Hungry Horse is at elevation 3513.2 feet and releasing the enough water to meet the Columbia Falls minimum flow. Given the current state of the forecast, the prospects for Hungry Horse refill do not look good in 2003, Norris added.

### ***5. New System Operational Requests.***

No new SORs were submitted prior to today's meeting.

**6. Recommended Operations.**

Turner said the current system operation will continue for the foreseeable future.

**7. Other.**

**A. 2003 Water Management Plan Spring/Summer Update.** Turner said the Corps will begin to work on the spring/summer update when the next water supply forecast becomes available; we should have a draft for you to look at at the next TMT meeting, he said. If there are any changes you would like to see to this document this year, please communicate them to me or to Scott Boyd prior to the 19<sup>th</sup>.

**B. Lower Granite Surface Bypass Removal.** Turner reported that the removal project is going forward and will be completed within two weeks; the only holdup is the current high flows in the system, because some Lower Granite units will need to be taken out of service for diver safety.

**C. McNary Spill Gate Hoist Testing.** Turner said the Corps plans to spill up to 32 Kcfs at McNary for one to two hours today and tomorrow, to test the gate hoist on Spill Bay 11 at that project. TDG levels below the project are expected to be in the 110%-130% range during the test. He said Oregon DEQ has been informed of the test; the purpose of which is to address a Corps safety issue.

**D. Lower Monumental Spillway Repairs.** Turner said the contractor is still working on the repairs to the Lower Monumental spillway; the repair work will be completed by February 14, and the contractor will be out by the end of February.

**E. New Water Supply Forecast.** Turner said the Corps plans to re-run their water supply forecast once the February early-bird forecast is available; the TMT agreed that this would be helpful.

**8. Next TMT Meeting Date.**

The next face-to-face meeting of the Technical Management Team was set for Wednesday, February 19. Meeting summary prepared by Jeff Kuechle, BPA contractor.

**TMT PARTICIPANT LIST**

**February 5, 2003**

<b>Name</b>	<b>Affiliation</b>
Rudd Turner	COE
Tony Norris	USBR
Scott Bettin	BPA
Paul Wagner	NOAA Fisheries

Shane Scott	WDFW
Ron Boyce	ODFW
Tina Lundell	COE
Mike O'Bryant	Columbia Basin Bulletin
Kyle Martin	CRITFC
Tom Haymaker	PNGC
Chris Ross	NOAA Fisheries
Colin Beam	PPM
Tim Heizenrader	PPM
Russ George	WMCI
Steven Wallace	PacifiCorp
Ken Soderlind	COE
David Benner	FPC
Robin Harkless	Facilitation Team
Kristine Bartlett	BPA
Patti Etzel	COE
Julie Ammann	COE
Nancy Yun	COE
Mary Karen Scullion	COE
John Wellschlager	BPA
Richard Cassidy	COE
Scott Boyd	COE
Jennifer Richman	COE
Terri Salcedo	COE
Todd Perry	CPS
Kevin Nordt	PGE
John Gleason	BPA
Donna Silverberg	Facilitation Team
Harold Opitz	RFC





# Oregon

Theodore R. Kulongoski  
Governor

## Department of Fish and Wildlife

Fish Division  
2501 SW First Avenue  
P.O. Box 59  
Portland, OR 97207-0059  
Voice: 503-872-5252  
Fax: 503-872-5632  
TTY: 503-872-5259

<http://www.dfw.state.or.us>

February 4, 2003



Scott Bettin, Bonneville Power Administration  
Tony Norris, Bureau of Reclamation  
Rudd Turner, Corps of Engineers

Re: Reduction of Chum and Chinook Protection Flows

Dear Mr. Bettin, Norris, and Turner:

The Oregon Department of Fish and Wildlife and U.S. Fish and Wildlife Service are writing you to express our concern regarding the decision by the National Marine Fisheries Service (NMFS) and the Action Agencies to reduce flows for protection of chum redds below Bonneville Dam. The decision, which was to reduce tailwater elevations below Bonneville from 11.5 to 11.2 ft, was based on the concern that continuing to provide flows to maintain the higher tailwater elevation would reduce the probability of meeting April 10 Upper Rule Curves (URC) as required by NMFS' 2000 Biological Opinion, not on any biological data.

The recent impact assessment of chum redds (January 16) from lowered tailwater elevations below Bonneville Dam did not provide any reliable, quantitative information on which to base biological decisions. In fact, no consensus among the Salmon Managers could be reached based on the qualitative assessment made.

The survey did not take into account the ability to identify viable redds this late into the season. Widely fluctuating tailwaters during and after the spawning season moved gravel around in the spawning area. Coupled with algae growth, critical redd locations could not be assured.

The survey and results, presented as long term impacts at public meetings, does not account for the integration of the other key components (variability caused by local stream inflow and the changing tidal/backwater effects) that are important for understanding true long term population impacts. Quantitative modeling assessments of the spawning habitat and impact on chum redds have been made based on Bonneville tailwater, local stream flow, and the tidal/backwater effect. This work has been a cooperative effort involving the Washington Department of Fish and Wildlife, the Oregon Department of Fish and Wildlife, the U.S. Geological Service, and the U.S. Fish and Wildlife Service. These assessments have been made at various combinations of tailwater, local stream flow and tidal/backwater elevations. These conditions change over time and must be constantly monitored closely if managers are trying to control the wetted spawning area to the tenth of a foot in elevation. Because of the extreme variability of conditions in the

Ives Island complex, this goal is hydraulically impossible. Project operators have told the fishery managers they cannot manage to a single tenth of a foot of Bonneville tailwater elevation, but need an operating range of at least one-half foot to operate.

With certainty, lowering the tailwater elevations below 11.5 feet increases the risk of chum mortality, potentially well over 20% at an 11.0 ft tailwater, in an area already managed to a minimum level, with mass spawnings in a much reduced spawning area.

We concur with the high priority for meeting the April 10 URC's to store as much water for spring flow augmentation and meeting all other requirements of the Biological Opinion. The consensus among the fishery managers is that reducing flow and dewatering chum redds would be adverse for chum. We understand that under the terms of the NMFS 2000 Biological Opinion that meeting the April 10 URC for spring migrants is a priority over protection of the natural chum spawning area below Bonneville Dam. Low runoff predictions (forecasted to be 80 maf at The Dalles or about 75% of normal) strongly indicate that the April 10 reservoir elevations will not be met regardless of the present decision to dewater chum redds. An informed decision to dewater chum redds should have acknowledged that adequate protection for chum salmon has not been provided in the last three years since the 2000 Biological Opinion has been in effect. The small savings in water from dropping tailwater from 11.5 to 11.2 ft will make little difference in meeting April 10 URC's given the low runoff projections and high variability of predictions (+/- 30 maf). Also, there is no guarantee that any "fish" water banked now will be available for future fish operations but used for other purposes (i.e. power generation in the event of cold weather or other high power demand).

The fundamental issue at the basis of this management predicament is that trade-offs of protection measures between the different listed stocks are being implemented prior to a thorough consideration of alternatives to mitigate for impacts. This is particularly tragic since very few natural mainstem spawning areas like Ives Island remain in the Columbia Basin. The decision to reduce protection for chum salmon was made without a thorough consideration of alternatives to mitigate for any shortfalls of reaching April 10 URC's, such as releases from Canadian reservoirs. Recent heavy rains have dramatically increased flows in the lower Columbia and it appears that an 11.5 ft tailwater will be maintained for a few more days so there is time to reconsider the decision. The opportunity is much greater for reducing long term risks for any shortfalls in spring flows while little opportunity exists to undo the harm caused now by the deliberate dewatering of chum and chinook redds.

February 4, 2003  
Page Three

A more prudent course would be to continue 11.5 ft tailwater protection flows for chum and aggressively begin contingency planning for addressing shortfalls through flexibility in the hydrosystem and equitably assigning risks between fish operations and other river uses such as flood control, irrigation, power, and recreation.

We appreciate the opportunity to provide these comments and look forward to working with you in developing operational plans that will better meet the needs of mainstem spawning chum and chinook below Bonneville Dam. We hope the Action Agencies and NMFS will acquire additional water volumes to assure that the April 10 reservoir elevations are met.

Sincerely,

*Signature on Original, Hard Copy to Follow*

Raymond R. Boyce  
Oregon Department of Fish and Wildlife

*Signature on Original, Hard Copy to Follow*

David A. Wills  
U.S. Fish and Wildlife Service

C: Technical Management Team  
Implementation Team  
Fish Passage Advisory Committee

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / Steve Kerns

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

19 February 2003      0900 - 1200 hours

Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. Water Management Plan, [draft spring/summer update](#) (430kB)  (COE).
3. Chum emergence updates (WDFW, NMFS, ODFW).
4. [Q-adjust model results](#) (31kB)  (COE).
5. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - reservoir operation, power system, water supply (COE, BOR, BPA)
6. Review operations requests.
7. Develop recommended operations.
8. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**TECHNICAL MANAGEMENT TEAM  
MEETING NOTES  
February 19, 2003  
CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE  
PORTLAND, OREGON**

**TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>**

***1. Greeting and Introductions***

The February 19 Technical Management Team meeting was chaired by Rudd Turner of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Turner at 503/808-3935.

***2. Water Management Plan Spring/Summer Update.***

Turner distributed copies of the initial draft of the spring/summer update, noting that it is also available via a hotlink on the agenda for today's meeting on the TMT website. He went briefly through its contents, particularly the most recent (February final) forecast information on the first page of the document:

Lower Granite	14.7 MAF
The Dalles	65.3 MAF
Hungry Horse	1.53 MAF
Libby	4.7 MAF

Steve Pettit noted that, if these figures hold up and April-August runoff at The Dalles stays below 85 MAF, there would be no spill at the Lower Snake collector projects and the system would go to maximum transport. Ron Boyce said it is his hope that such a decision would be made in-season, as better forecast information becomes available later this spring. Clearly it's something we need further discussion on, Silverberg said; given the type of water year it's shaping up to be, it would probably be better to start that conversation sooner, rather than later.

The Reservoir Control Center is already being pressured by study project managers to give them some idea of the types of conditions we're likely to see this spring, Turner said. The group discussed the types of hydroanalysis model runs it would be possible for the Corps to produce between now and next TMT meeting; Paul Wagner suggested that an array of historic hydrologic runoff shapes in an 85 MAF year would be helpful. So you'd like us to look at a series of water years and hydrologic runoffs to see how likely it is that we'll be at or below 85 MAF once all is said and done? Turner asked. That would be helpful, Wagner replied. We'll try to have that ready for discussion at the March 5 TMT meeting, Turner said.

In response to a question from Boyce, Wagner said the decision about whether or not to go to maximum transport in the Snake is no longer as cut-and-dried as it was in the past; there is additional flow/survival and other data available now which will need to be factored into the equation. Again, we will discuss that further at our March 5 meeting, Silverberg said.

Turner also touched on the 2003 flow objectives (Lower Granite: 85 Kcfs spring, 50 Kcfs summer; McNary: 220 Kcfs spring, 200 Kcfs summer; Priest Rapids: 135 Kcfs spring) and the current analysis of the prospects for meeting them, as well as the current refill probabilities at Libby, Hungry Horse, Grand Coulee and Dworshak, based on the 59-year historic record. Turner noted that, if the current Libby forecast of 4.66 MAF holds up, that would be below the 4.8 MAF threshold for sturgeon “pulse” flows. Please refer to the draft spring/summer update for details of these analyses.

Another Corps participant noted that the current analysis shows Dworshak on minimum outflow through June in order to achieve June 30 refill; in other words, she said, it assumes no flow augmentation from Dworshak until July. And in terms of the Upper Snake flow augmentation contribution this year, said Tony Norris, the current very rough estimate is that Reclamation will be able to provide between 250 kaf and 300 kaf in 2003. If you look at the “teacup” diagrams showing the current status of the Upper Snake and Boise/Payette storage reservoirs, for the third year in a row the situation is not good, Norris said.

One question, said Turner – do you want the Corps to provide the “family of curves” showing current refill elevations, 30%-50%-70% June 30 refill probabilities and available spring flow augmentation volumes at each project, as we’ve done in the past? There was general TMT agreement that this would be helpful.

Turner asked the other TMT participants to review the spring/summer update and come to the next TMT meeting prepared to discuss it in more detail.

### ***3. Chum Emergence Update.***

Boyce said the bottom line here is that field personnel sampling 12 sites in the Lower Columbia have not yet caught very many emergent chum. He distributed a handout summarizing fall chinook and chum seining results below Bonneville Dam, through February 6; overall, he said, this (two total) is fewer chum than we would expect to have at this time, given the fact that groundwater temperatures are normal or above-normal for this time of year. He added that he talked to field personnel as recently as this morning, and they have still caught very few chum fry.

We don’t know exactly what’s happening out there, said Boyce, although there is some suspicion that redd superimposition due to limited spawning area availability may have played a role -- if the earlier redds were destroyed by subsequent spawners, we might expect to see later emergence this year. I do know it’s not from lack of sampling effort, he said -- we’re adding a 13<sup>th</sup> monitoring site this week. We will continue to monitor the situation and will provide further updates at future TMT meetings, said Boyce. Shane Scott said WDFW field personnel sampling farther downstream are reporting chum everywhere, as of yesterday. There were 4,900 adult chum observed at Ives Island in 2002, based on carcass tagging, Scott added.

#### ***4. Q-Adjust Model Results.***

Turner noted that this topic was covered during the spring/summer update discussion, Agenda Item 2, above.

#### ***5. Current System Conditions.***

Boyce noted that the Bonneville tailwater elevation fell below 11.3 feet for a few hours on Sunday; given the fact that the current operation is not detrimentally impacting Grand Coulee storage, isn't there some flexibility to provide a little additional water to smooth flows out at Bonneville? he asked. John Wellschlager explained the reasons for this temporary decrease; he said his understanding is that, absent any additional rain events, it will likely be necessary to start using Grand Coulee storage, possibly impacting the Vernita Bar operation, in order to maintain the requested Bonneville tailwater elevation as soon as next week. In the meantime, though, we'll try to smooth the flows further and ensure that there are no further violations of the hard constraint of 11.1 feet, Turner said. Boyce thanked Bonneville for doing a very good job on this operation so far, noting that this is the first violation of which he is aware.

Boyce added that the spring chinook run has now begun; counts are beginning to increase in the Willamette and at Bonneville, and this is expected to be a good fishing year.

With respect to current flows and reservoir elevations in the system, Turner said Bonneville released 113 Kcfs yesterday; flows at that project have averaged between 112 Kcfs and 160 Kcfs over the past two weeks. We've been holding the Bonneville tailwater elevation near 11.5 feet, for the most part, he added. At Lower Granite, yesterday's average flow was 24.1 Kcfs; flows there have averaged between 24 Kcfs and 40 Kcfs over the past two weeks. The current elevation at Dworshak is 1548.1; that project has filled 7 feet over the past two weeks. Dworshak continues to release minimum discharge of 1.5 Kcfs; inflows have been in the 4 Kcfs-9 Kcfs range over the past week. The project's February 28 flood control elevation is 1565 feet; we will likely miss that by 10-15 feet, Turner said. The current elevation at Libby is 2406.7 and drafting slightly, with 2.4 Kcfs inflow and a minimum outflow of 4 Kcfs.

Turner said Albeni Falls is holding steady at 2055.8 feet; the project is releasing 14 Kcfs. Norris said Grand Coulee is at elevation 1288 feet, Hungry Horse, at 3511.6 and drafting slightly to meet the Columbia Falls minimum.

Wellschlager reported that the power system is in good shape, currently; as reported earlier, the 11.3-foot minimum continues to be the default tailwater operation until it becomes necessary to draft the storage projects to maintain it. There is rain on the horizon, he said, so we'll see.

Turner then touched on February final water supply forecast information: 75.6 MAF, or 70% of normal, at The Dalles, January-July. 48.1 MAF, or 76% of normal, at Grand Coulee January-July; 3.49 MAF, or 55% of normal, at Brownlee; 1.82 MAF, or 69% of normal, at Dworshak, April-July; at Libby, April-August, 4.66 MAF, or 76% of normal. He also went

through precipitation data for the year to date in various basins. The February mid-month forecast will be out tomorrow, Turner added; based on recent precipitation events, we might even expect the mid-month forecast to go up a little.

**6. New System Operational Requests.**

No new SORs were submitted prior to today's meeting.

**7. Recommended Operations.**

Turner said the planned operation is to keep the headwater projects at minimum outflow, and operate the system to maintain the 11.3-foot Bonneville minimum tailwater elevation for as long as that operation does not impact Grand Coulee storage. At that point, the Bonneville minimum tailwater elevation will go to 11.0 feet, Turner said.

**8. Other.**

**A. SBC Removal at Lower Granite.** The removal of the Lower Granite surface bypass collector has been approved this year, Turner said; that means some unit outages at that project, beginning today, because of the safety needs of divers in the water. The contractor will be working at least two and possibly three shifts per day. The in-water work will end March 2, although it may extend a day or two beyond that, Wellschlager said. Turner cautioned that there may be short periods when only one unit is available at Lower Granite during the SBC removal project; if flows were to suddenly and dramatically increase, that could cause some spill at Lower Granite. However, we are pursuing a very aggressive schedule on this project, so hopefully any problems will be minimal, Turner said.

**9. Next TMT Meeting Date.**

The next meeting of the Technical Management Team was set for Wednesday, February 26 (10 a.m. to noon, to discuss process). The next regular TMT meeting was set for March 5. Scott noted that the TMT has discussed the possibility of a field trip to observe the juvenile chum seining below Bonneville; he said mid-March will likely be the best time for that field trip. Meeting summary prepared by Jeff Kuechle, BPA contractor.

**TMT Participant List  
February 19, 2003**

<b>Name</b>	<b>Affiliation</b>
Donna Silverberg	Facilitation Team
Ron Boyce	ODFW
Paul Wagner	NMFS
David Wills	USFWS

Shane Scott	WDFW
Steve Pettit	IDFG
Rudd Turner	COE
John Wellschlager	BPA
Ruth Burris	PPL
Scott Boyd	COE
Kyle Martin	CRITFC
Nancy Yun	COE
Mike O'Bryant	Columbia Basin Bulletin
Kevin Nordt	PGE
Tina Lundell	COE
Richelle Harding	D. Rohr & Associates
Russ George	WMCI
Jackie Abel	Facilitation Team
Robin Harkless	Facilitation Team
Margaret Filardo	FPC
David Benner	FPC
Jim Brooks	Observer
Tom Haymaker	PNGC Power
Mike Butchko	PowerX
Glen Traeger	Avista Energy

Turner  
Silverberg  
Norris  
Scott  
Wills  
Abel  
Colin Beam

O'Bryant  
Harkless  
John Wellschlager, BPA  
Pettit  
Boyd  
Yun  
Wagner  
Martin  
Boyce  
Nordt  
David Benner  
Jim Brooks  
Ruth Burris  
Tom Haymaker, PNGC Power  
Tina Lundell  
Richelle Harding  
Filardo  
Butchko  
George  
Traeger  
Martin Hatcher, SCL  
Todd Perry, Conservation Power Source

## Summary of February 2003 QADJ Model Runs

14-Feb-03

### Assumptions:

- \* Streamflows were adjusted to the February Final Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were actual Jan 31 observed data.
- \* Grand Coulee operates to meet 70 kcfs at Priest Rapids Feb - Apr 15. Coulee attempts to meet McNary flows May-June.
- \* Hungry Horse operates to VARQ, meets minimum flows at Columbia Falls, targets full in June, and drafts to 3540 ft by 31 Aug.
- \* Brownlee operates to flood control elevations.
- \* Dworshak targets full in June, releases a maximum of 13,000 cfs in July - August for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on 4 kcfs minimum flow or VARQ flood control Feb - Apr. Operates on 4 kcfs minimum flow in May, 6 kcfs in June, targets full in July, and drafts to 2439 ft by 31 Aug.

### Results:

Priest Rapids Meets Flow Objectives of 70 kcfs Jan - Apr1 and 135 kcfs Apr2 - Jun:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Feb	59	71
Mar	42	75
Apr1	59	78
Apr2	3	91
May	55	152
Jun	11	99

Grand Coulee meets an Apr 15 target elevation of 1283.3 ft in 18 out of 59 years with an average elevation for the 59 years of 1270.8 ft.

Lower Granite Meets Flow Objectives of 85 kcfs in Apr - May, 73.3 kcfs in June and 50 kcfs in Jul - Aug:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Apr2	2	55
May	26	82
Jun	26	73
Jul	5	40
Aug1	0	31
Aug2	0	24

McNary Meets Flow Objectives of 220 kcfs in Apr2 - Jun and 200 kcfs in Jul - Aug:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Apr2	1	140
May	43	218
Jun	4	171
Jul	0	131
Aug1	0	124
Aug2	0	116

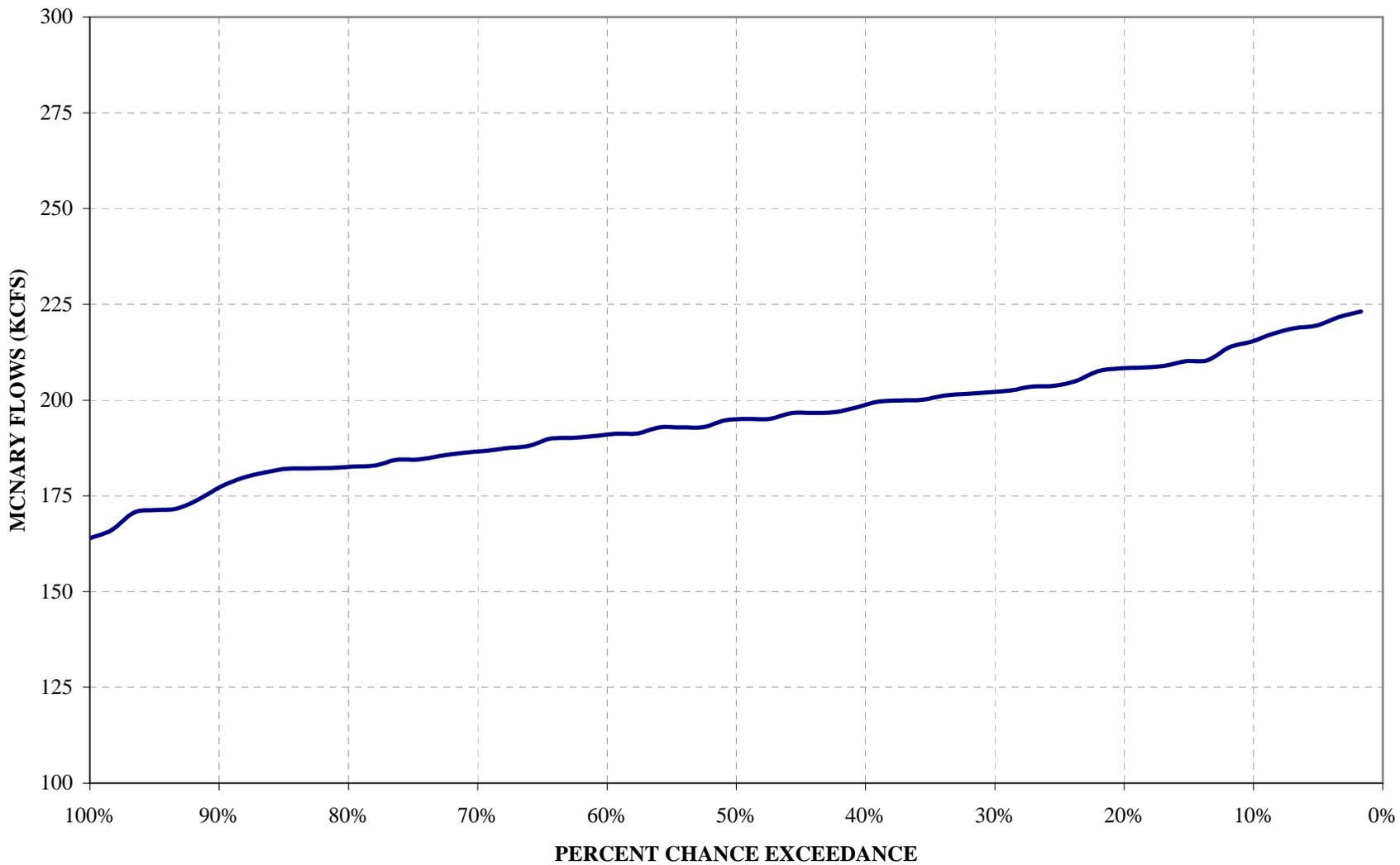
Bonneville Meets Flow Objectives of 125 kcfs in Feb - Apr:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Feb	12	118
Mar	18	124
Apr1	45	143
Apr2	51	160

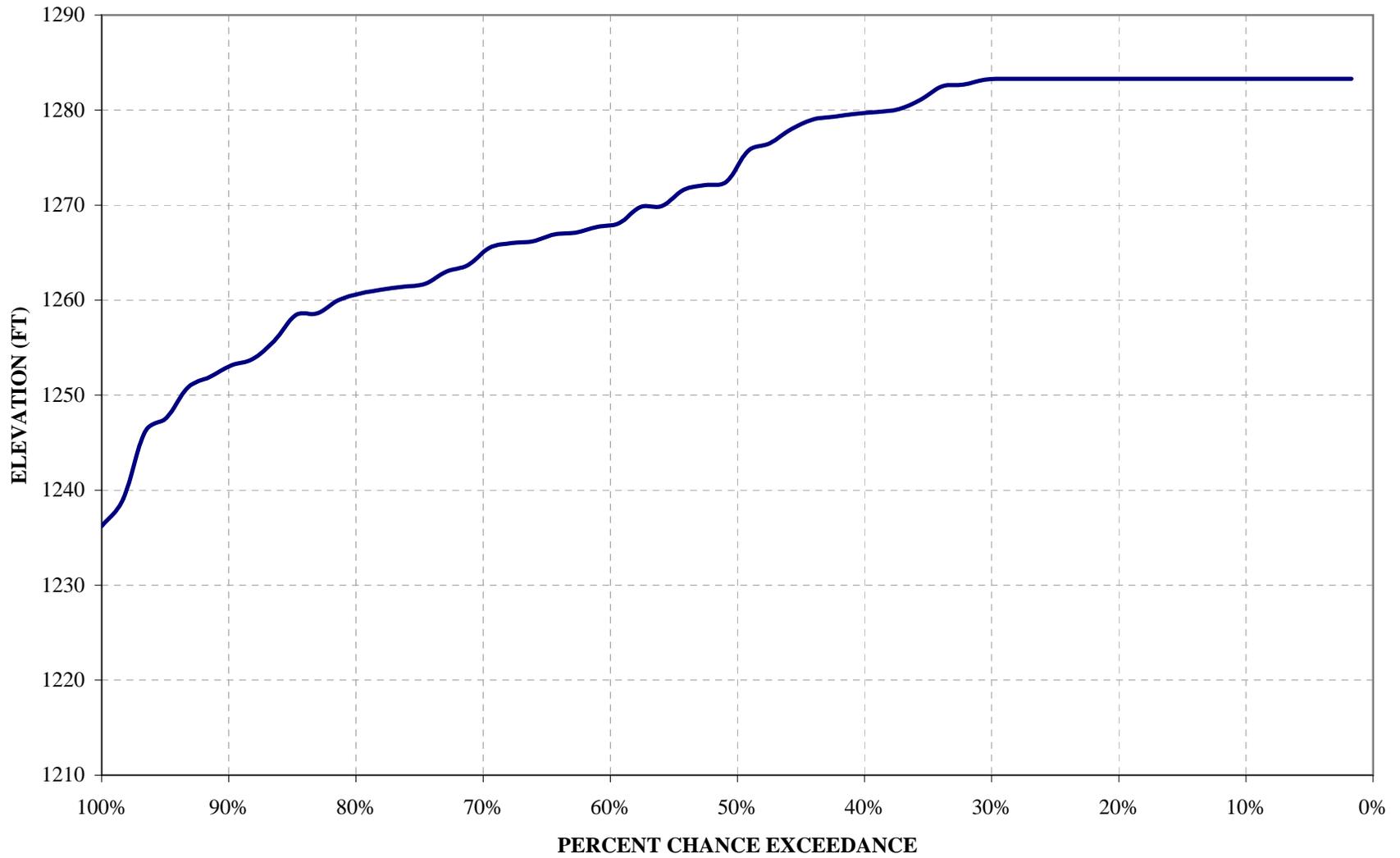
Projects Refill by 30 June:

Month	Occurrences out of 59 Years	Average Elevation on 30 Jun for 59 Years
Libby	54	2459
Hungry Horse	28	3558
Grand Coulee	59	1288
Dworshak	54	1600

**MCNARY OUTFLOW  
MAY-JUNE AVERAGE**

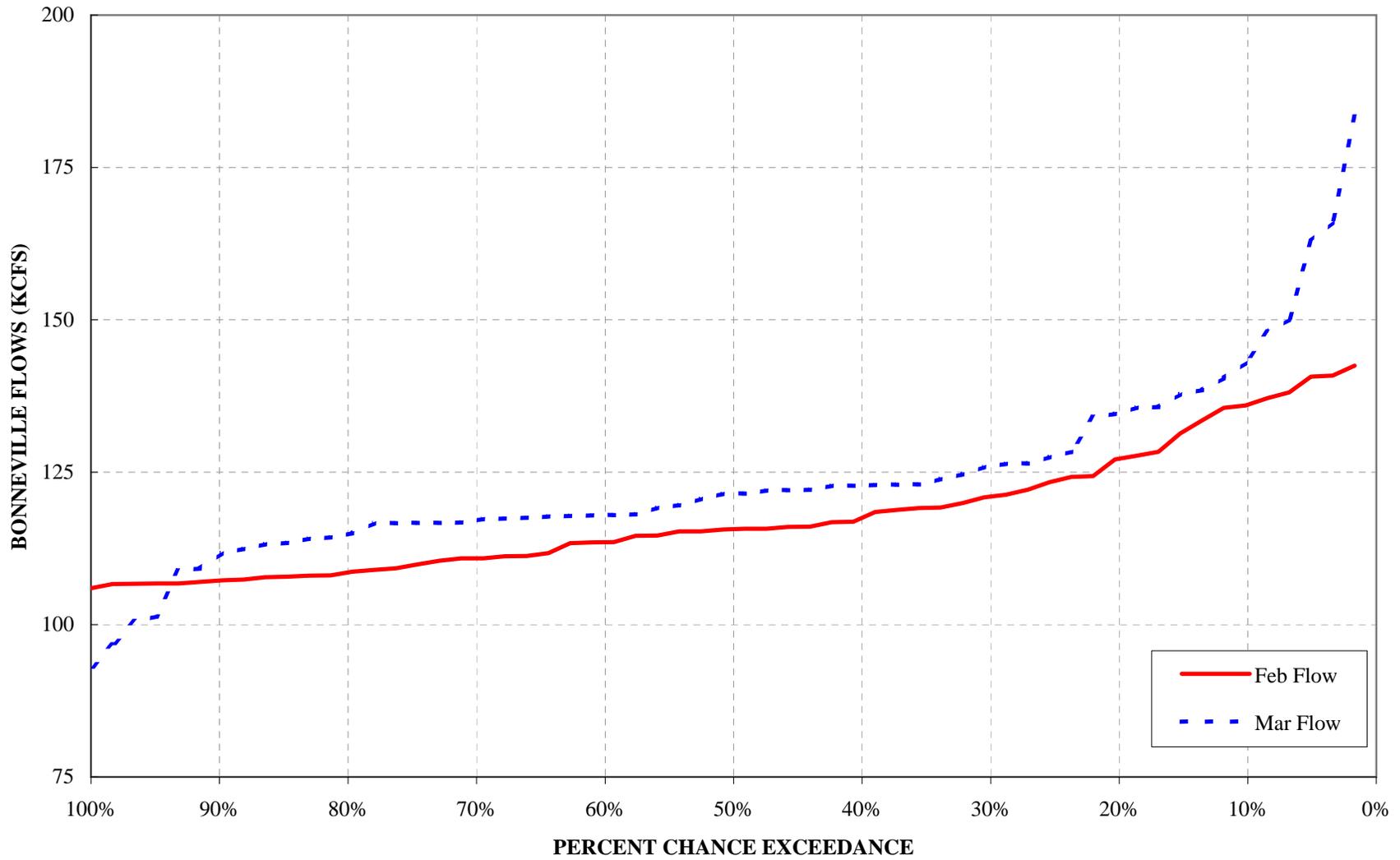


**GRAND COULEE  
APR 15 ELEVATION**



# BONNEVILLE OUTFLOW

## FEB, MAR FLOWS



# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**26 February 2003      1000 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. TMT process.

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**COLUMBIA RIVER REGIONAL FORUM**  
**Technical Management Team**  
**Process Meeting**  
**February 26, 2003**

Facilitators: Donna Silverberg and Jacqueline Abel

The following is a summary of the process discussion between members of the Technical Management Team on 2/26/03. The notes are not intended to be a verbatim account of the meeting nor do they serve as the official “record”. They are intended to highlight discussion points, decisions, and actions.

**TMT/IT Guidelines:**

Jacqueline Abel, facilitator, did a comparison analysis of the IT and TMT Guidelines and highlighted differences between the two in a handout.

Consensus: TMT discussed the definition of “consensus”, as it is not defined exactly the same way in the two documents. While generally the group felt that the two definitions do align, members agreed to make the following additions to the TMT definition of “consensus”:

- Bring the definition into alignment with the IT Guidelines, and add “strong” objection.
- State that objections not strong enough to be elevated to IT will be documented in the minutes.

A question was raised about how decisions are made when no consensus is reached and then documented. While TMT or NOAA makes the recommendation, the Action Agencies make the decision about how to operate. The group will add some language to the Guidelines that states this.

**ACTION:** The Action Agencies will put decisions in writing and send them to the TMT chair, who will distribute to the rest of TMT before the next regularly scheduled meeting. NOAA will put in writing the rationale behind its recommendation, and distribute to the group as soon as possible.

Schedule: On page three of the TMT Guidelines is a schedule of weekly operations. The group discussed ways that the schedule could be restructured to allow TMT to make best use of available information and alleviate time constraints.

**ACTION:** Cindy Henriksen, COE, will ask RFC to either produce model runs by Monday or Tuesday or later in the week, on Thursday, which FPAC can use in its discussions the following Monday or Tuesday. FPAC will discuss the latter possibility. All will keep in mind the importance of “real time” information and how well the current schedule has worked so far this year. There is also a possibility that TMT could meet from 1-4 pm on Wednesdays to review and discuss data released late Tuesday or early Wednesday.

Membership: The facilitation team will contact tribal groups and find out who are the TMT representatives or points of contact. There will be one list of “Designated” members and another for “Points of Contact”.

**ACTION:** The facilitation team will revise the TMT Guidelines and send a redline version to TMT members by Friday, March 7. TMT will review the revisions and discuss them at the end of the March 19 meeting.

**Ground Rules and Expectations:**

A change will be made to say that the meetings will start and end on time “unless otherwise agreed to by the group”.

There was some discussion on “tone” of the group. While jokes and sarcasm are an important part of the group dynamic, members would like the facilitator to point out when the tone has not been appropriate in discussions. The facilitator will use her professional judgment in how she points this out, either during the meeting or to individuals after the meeting.

Two bullets will be added to the list of ground rules:

- Be mindful that members are representatives of agencies.
- Separate the people from the problem!

TMT will continue its discussion of ground rules and expectations at the March 19 TMT meeting. There will also be a discussion of whether there should be designated time on the agenda for public comment, and when that should be.

A summary of the facilitation services evaluations, compiled by Jacqueline Abel, was handed out and will be discussed at the next TMT meeting. The group was asked to review particularly Question 3, which asked how the facilitation team can and does assist you in the Regional Forum process.

**Next Meeting, March 5:**

**NOTE: The March 5 meeting has been changed to Wednesday afternoon, 2-5 pm, due to scheduling conflicts.**

**Agenda Items:**

- Water Management Plan Spring/Summer Update
- NOAA Parameters for Maximum Transport
- Low Flow Effects at Bonneville
- McNary TDG Spill Test Proposal
- Chum Emergence Update – Oregon and Washington
- Lower Granite Surface Bypass Collector Update
- Schedule Seining Field Trip

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**5 March 2003      1400 - 1700 hours**

**\*\*\*NOTE CHANGE IN TIME\*\*\***

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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## AGENDA

1. Welcome and introductions.
2. Water Management Plan, draft spring/summer update (COE).
3. Chum emergence updates (WDFW, ODFW).
4. NOAA parameters for maximum transport.
5. Low flow effects at Bonneville.
6. McNary TDG Spill Test proposal (COE).
7. Lower Granite Surface Bypass Collector update (COE).
8. Schedule Ives/Pierce Island seining field trip.
9. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - reservoir operation, power system, water supply (COE, BOR, BPA)
  - Status of Columbia Generating Station (BPA)
10. Review operations requests.
11. Develop recommended operations.
12. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

# **COLUMBIA RIVER REGIONAL FORUM**

## **TECHNICAL MANAGEMENT TEAM**

March 5, 2003

### **FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS**

Facilitator: Donna Silverberg

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

#### **Water Management Plan:**

Scott Boyd, COE, received one comment from the Fish Passage Center on the WMP. The next draft will include the March final forecast. Paul Wagner, NOAA, suggested that the WMP include a section on relevant research that, as a result of the research, may change operations or spill patterns. There was some discussion on whether this information is appropriate for the WMP document.

**ACTION:** Paul will provide TMT with a specific example of what types of research he means at the next TMT meeting. One example he provided is a proposal to increase the spill cap at Bonneville based on research that has recently been completed. There needs to be a discussion of this research at FPAC before the TMT discussion of the process for adopting the change. The group also discussed the timing of finalizing the document. Another draft WMP will be distributed in March, and the document will be finalized with the April final forecast.

#### **Chum Emergence:**

Ron Boyce reported that there was an increase in chum, 22 in all, seen at Ive's Island on Friday, Feb. 28. Ron also reported that there have been a lot of observed Chinook. It was noted that typically, chum emergence occurs in March and early April so it is still early in the season. He will keep the group updated as the season continues.

#### **NOAA Parameters for Maximum Transport:**

Paul Wagner reported that 85 kcfs is the threshold for no transport when flows are expected to meet or exceed voluntary spill. When there is an unusual water year, as in this year, there will be more discussion on the issue and actual runoff numbers will be considered. It was noted that this is a new mode of addressing the issue. The group agreed that this issue needs further discussion.

**ACTION:** The NMFS Science Center will present information from the latest transport study at the March 19 TMT meeting. There was a request that FPAC review the study results prior to the TMT meeting. Paul and Sharon Kiefer will coordinate on getting Idaho results as well.

#### **McNary TDG Spill Test Proposal:**

Due to lack of funding, the spill test at McNary is not being considered for this year. An update was given that the “hoists passed their tests” at McNary.

**Lower Granite Surface Bypass Collector:**

The removal of the surface bypass collector at Lower Granite is underway, with completion expected on Monday, March 10. So far, no spill has been required, and none is expected. TMT members expressed appreciation to the contractors for working around them!

**Ive’s/Pierce Island Seining Field Trip:**

Ron Boyce will coordinate a field trip for the week of March 20 for those interested in observing seining at Ive’s and Pierce Islands.

**Current System Conditions:**

*Fish status:* It is still early for the adult Spring Chinook run; so far, 12 have been observed at Bonneville. Ron Boyce reported high projections for this year’s adult Fall Chinook run – 622,600. The Columbia River Coho return is expected to be 817,000.

*Reservoir operations/water supply:* The RFC released an early bird forecast, projecting about 72-73% average water supply at the COE projects. A final forecast will be out on Monday. Dworshak is at elevation 1553’, Hungry Horse is drafting and at 3509’, and Grand Coulee is at 1284.5’.

**Status of Columbia Generating Station:**

The CGS will be out another week for repair of damaged bearings. The hope is for full power to return by March 16. Until then, TMT agreed to draft Dworshak at 4.3 kcfs from Thursday, March 6 through Wednesday, March 12, about 20 kaf to meet load. Then, depending on rainfall levels, Grand Coulee will be drafted ½ foot per day to meet load. This may impact April 10 refill at Grand Coulee (a larger miss than already expected) and movement of flows out of spring into winter.

**ACTION:** Per Oregon’s request, BPA will provide modeling data with effects on flows and elevations.

BPA will monitor the situation and attempt to mitigate for impacts that it causes. The group clarified that while there is not a recommendation from the group, there are no objections to the stated operation. Oregon expressed that there were strong efforts to get the water into Grand Coulee and many fish are expected this year, and that this operation will affect the Biological Opinion. There will be an update on this issue at the March 19 meeting.

**Other:**

The Lake Roosevelt Forum is still extending an invitation to the TMT to hold its meeting in Spokane on April 23. Cindy Henriksen will put a link of the Forum’s conference on the TMT website, as the program has changed since TMT last discussed it. The group did not confirm yet whether or not it will travel to Spokane.

**Next Meeting:**

*Agenda Items:*

- TMT process follow-up
  - Wednesday meeting AM or PM?
- WMP Update
- Bonneville Spill Study – Gary Fredericks
- Chum
- NOAA Science Center – Transport Study
- Idaho Fish and Game – Transport Study?
- CGS Update
- Spill Starting on Snake River

# TECHNICAL MANAGEMENT TEAM

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**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## EMERGENCY TMT CONFERENCE CALL

**7 March 2003      0900 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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### AGENDA

1. An emergency TMT conference call has been requested by USFWS to discuss [SOR 2003-02](#).

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

## **COLUMBIA RIVER REGIONAL FORUM**

**Technical Management Team**

**Emergency Conference Call**

**March 7, 2003**

Facilitator: Donna Silverberg

The following is a summary of the process discussion between members of the Technical Management Team on 3/7/03. The notes are not intended to be a verbatim account of the meeting nor do they serve as the official "record". They are intended to highlight discussion points, decisions, and actions.

### **SOR 2003-02:**

Dave Wills, USFWS, presented an SOR for fishery operations at the Bonneville project following the March 8 Spring Creek Hatchery release. The request reflects this year's unique conditions and facilitates movement of the juvenile out-migrants. The request is to maintain a minimum tailwater of 13' and provide spill at 50 kcfs beginning Monday evening 3/10 for 36 hours (less than the normal 100-150 kcfs from previous years). This operation would provide depth protection of chum redds and TDG levels at or below 110%. The request has been presented due to the extra water from the CGS outage, a forecast for heavy rain and the conjunction with the peak of fish migration. If, however, there is not evidence of passage on Monday morning, the request is to hold off on spill until the following morning. Dave noted that it is also important not to jeopardize the April 10 flood control rule curve.

Ron Boyce, Oregon, advocated for spill at higher levels and a longer period of time, as in past years. While Oregon felt this to be a "bare bones" operation for a critical fishery stock, the state will not elevate the issue to IT. Scott Bettin, BPA, requested that the Regional Executives discuss the issue at their meeting this morning and give the final "go-ahead".

**ACTION:** Cindy Henriksen, COE, will report the following points to the Regional Executives during their meeting this morning:

- From a technical standpoint, TMT members agree that the SOR is feasible.
- Oregon, USFWS, and CRITFC expressed a desire to see more spill, but support the SOR.
- The BPA TMT representative requested Executive approval of the SOR before implementing it.

Cindy will notify TMT on the outcome of the Regional Executives meeting as soon as possible.

Liz Hamilton, Northwest Sport Fishing Industry Association, expressed that the Spring Creek hatchery fish are the driver for the largest fishery of the season. Bob Heinith, CRITFC, noted this is true for sport fishing, trollers, the Alaskan fishery and the tribal fishery.

# TECHNICAL MANAGEMENT TEAM

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**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

19 March 2003 0900 - 1200 hours

Custom House Room 118  
Portland, Oregon  
Conference call line: 503-808-5190

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## AGENDA

1. Welcome and introductions.
2. TMT process follow-up
  - Wednesday meeting AM or PM?
3. WMP Update [\[Spring / Summer Update draft #2\]](#) (38k) 
4. Bonneville Spill Study - Gary Fredericks
5. Chum
6. NOAA Science Center - Transport Study [\[Slides\]](#) (45k) 
7. Idaho Fish and Game - Transport Study?
8. CGS Update
9. Spill Starting on Snake River
  - Lower Monumental Spill
  - Ice Harbor Spill: Research
10. CRITFC 2003 [River Operations Plan](#) (379k)  [\[Hydrographs\]](#) (70k)  - Kyle Martin
11. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - reservoir operation, power system, water supply (COE, BOR, BPA) [\[Q-Adjust Summary\]](#) (44k) 
  - Status of Columbia Generating Station (BPA)
12. Review operations requests.
13. Develop recommended operations.
14. Other.
  - set agenda for next meeting

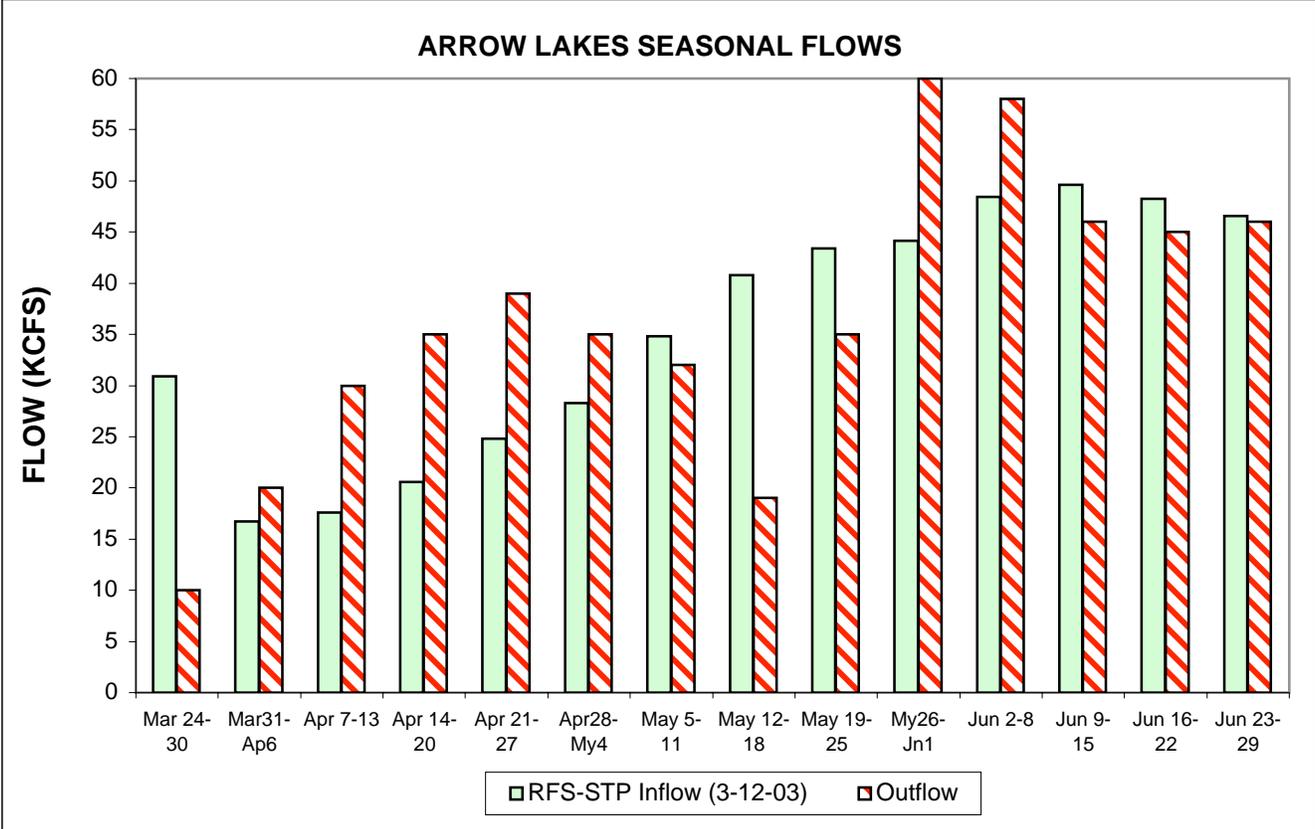
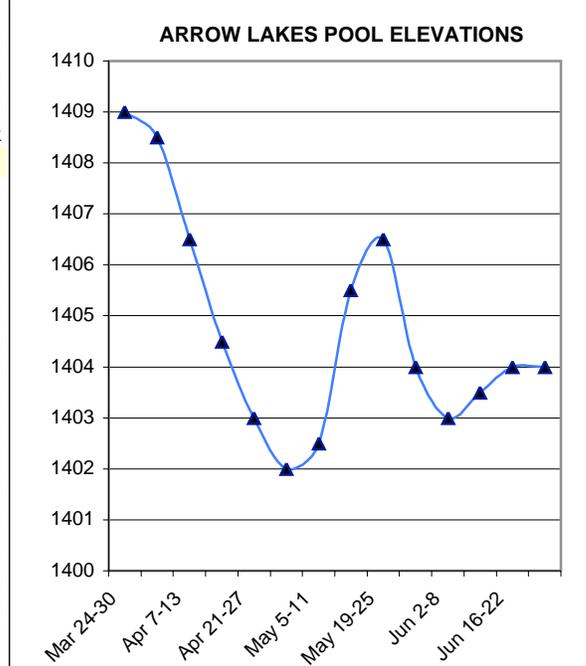
*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**Columbia River at Arrow Lakes (ARDB)**

18-Mar-03	Outflow (CRITFC) (kcfs)	RFS-STP Inflow (3-12-03) (NWRFC) (kcfs)	Storage Change (KaF)	ARDB Pool Elevation (feet) end-of-week Observed:
Mar 23rd				1406.0
Mar 24-30	10	30.9	290	1409.0
Mar31-Apr6	20	16.7	-46	1408.5
Apr 7-13	30	17.6	-172	1406.5
Apr 14-20	35	20.6	-200	1404.5
Apr 21-27	39	24.8	-197	1403.0
Apr28-May4	35	28.3	-94	1402.0
May 5-11	32	34.8	39	1402.5
May 12-18	19	40.8	303	1405.5
May 19-25	35	43.4	116	1406.5
My26-Jn1	60	44.2	-220	1404.0
Jun 2-8	58	48.4	-133	1403.0
Jun 9-15	46	49.6	51	1403.5
Jun 16-22	45	48.3	45	1404.0
Jun 23-29	46	46.6	8	1404.0
<b>Total (KaF):</b>	<b>6,941</b>	<b>6,442</b>	<b>-209</b>	

CRITFC Hydro Program

Altered Flood Control

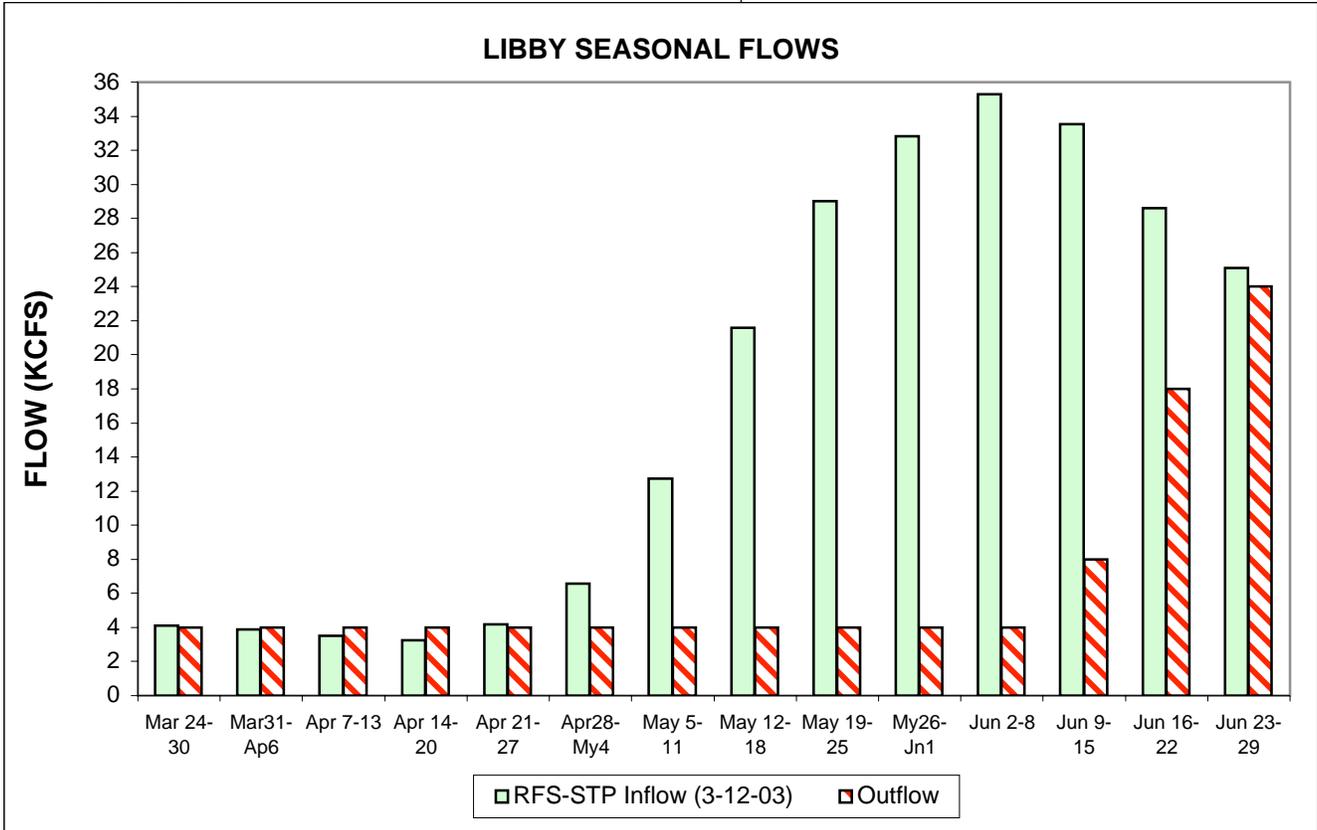
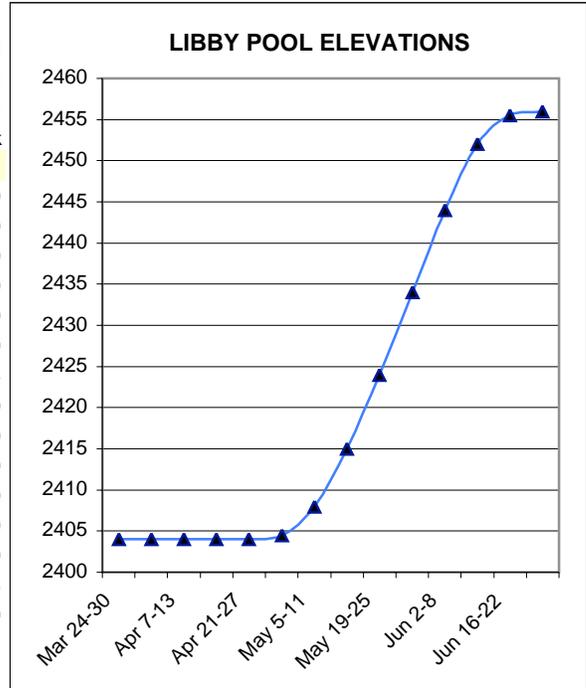


**Kootenay River at Libby (LIB)**

18-Mar-03 WY 2003 SPRING	Outflow (CRITFC) (kcfs)	RFS-STP Inflow (3-12-03) (NWRFC) (kcfs)	Storage Change (KaF)	LIB Pool Elevation (feet) end-of-week Observed:
		Observed: (shaded)		Observed:
Mar 23rd				2404.0
Mar 24-30	4	4.1	1	2404.0
Mar31-Apr6	4	3.9	-2	2404.0
Apr 7-13	4	3.5	-7	2404.0
Apr 14-20	4	3.2	-11	2404.0
Apr 21-27	4	4.2	3	2404.0
Apr28-May4	4	6.6	36	2404.5
May 5-11	4	12.7	121	2408.0
May 12-18	4	21.6	244	2415.0
May 19-25	4	29.0	348	2424.0
My26-Jn1	4	32.8	400	2434.0
Jun 2-8	4	35.3	434	2444.0
Jun 9-15	8	33.5	355	2452.0
Jun 16-22	18	28.6	147	2455.5
Jun 23-29	24	25.1	15	2456.0
<b>Total (KaF):</b>	<b>1,249</b>	<b>3,042</b>	<b>2085</b>	

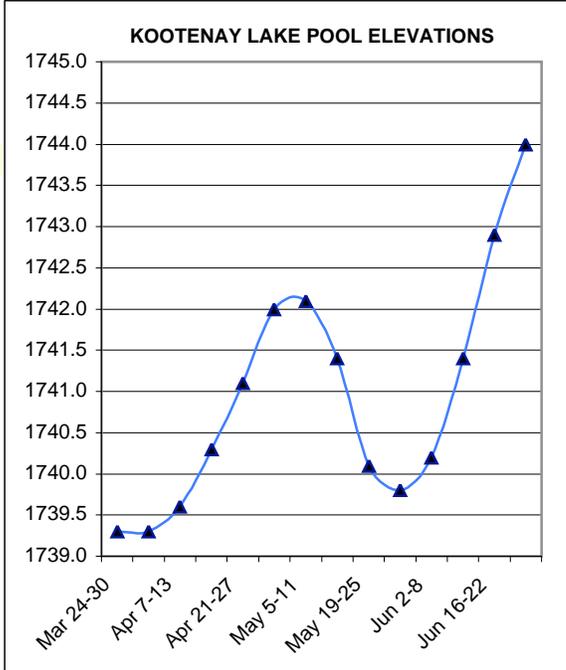
CRITFC Hydro Program

modified VAR-Q

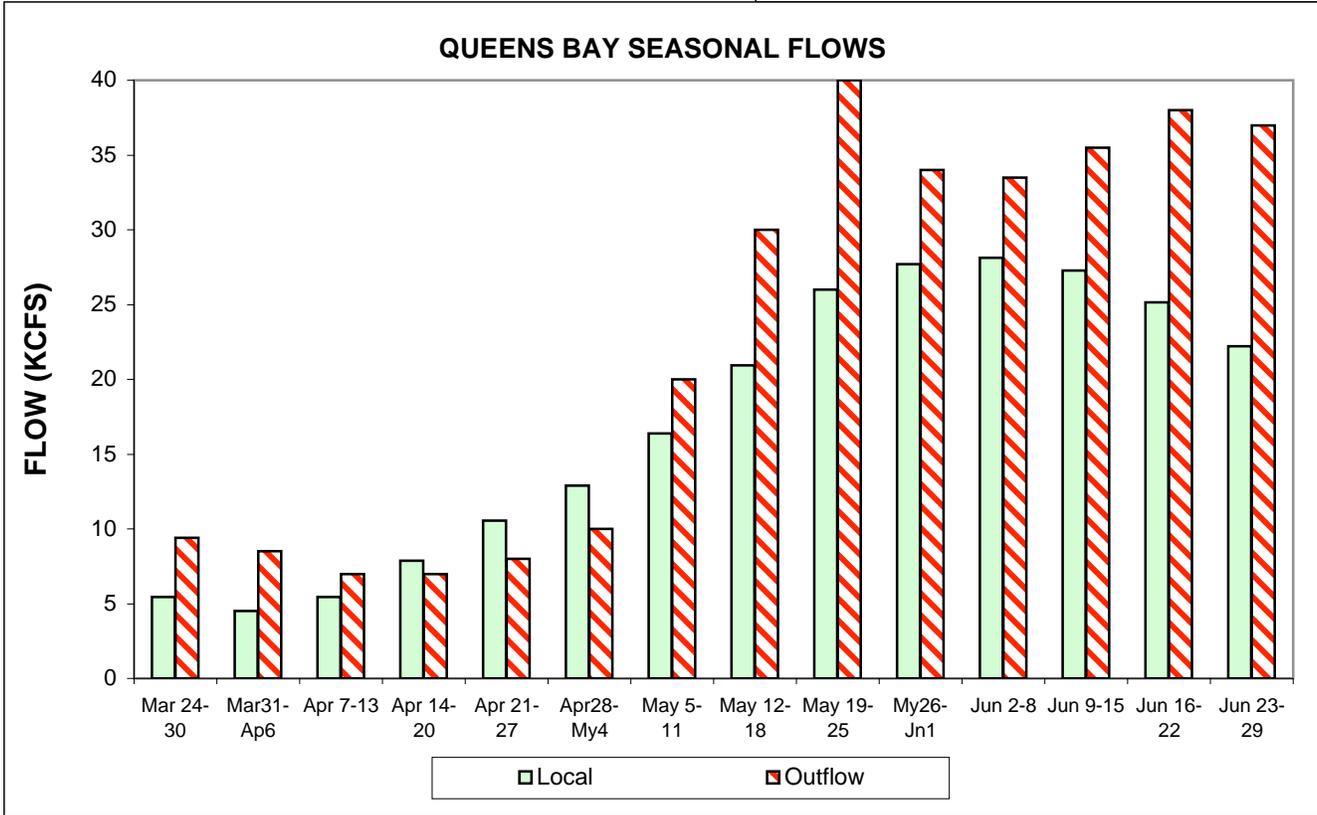


**Kootenay River at Queens Bay (QBYB)**

18-Mar-03	Outflow (CRITFC) (kcfs)	Libby Outflow (CRITFC) (kcfs)	Local Inflow (2001 DCD) (kcfs)	Storage Change (KaF)	QBYB Pool Elevation (feet) end-of-week Observed:
Mar 23rd					1739.3
Mar 24-30	9.4	4	5.4	1	1739.3
Mar31-Apr6	8.5	4	4.5	0	1739.3
Apr 7-13	7.0	4	5.4	34	1739.6
Apr 14-20	7.0	4	7.9	68	1740.3
Apr 21-27	8.0	4	10.6	91	1741.1
Apr28-May4	10.0	4	12.9	95	1742.0
May 5-11	20.0	4	16.4	5	1742.1
May 12-18	30.0	4	20.9	-70	1741.4
May 19-25	40.0	4	26.0	-139	1740.1
My26-Jn1	34.0	4	27.7	-32	1739.8
Jun 2-8	33.5	8	28.1	37	1740.2
Jun 9-15	35.5	18	27.3	136	1741.4
Jun 16-22	38.0	24	25.2	155	1742.9
Jun 23-29	37.0	24	22.2	128	1744.0
<b>Total (KaF):</b>	<b>4,283</b>	<b>1,249</b>	<b>3,031</b>	<b>508</b>	

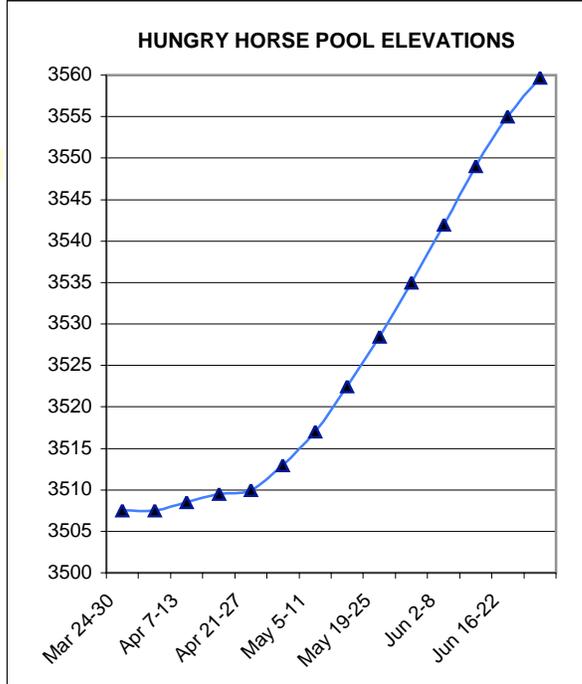


CRITFC Hydro Program



**S. F. Flathead River at Hungry Horse (HGH)**

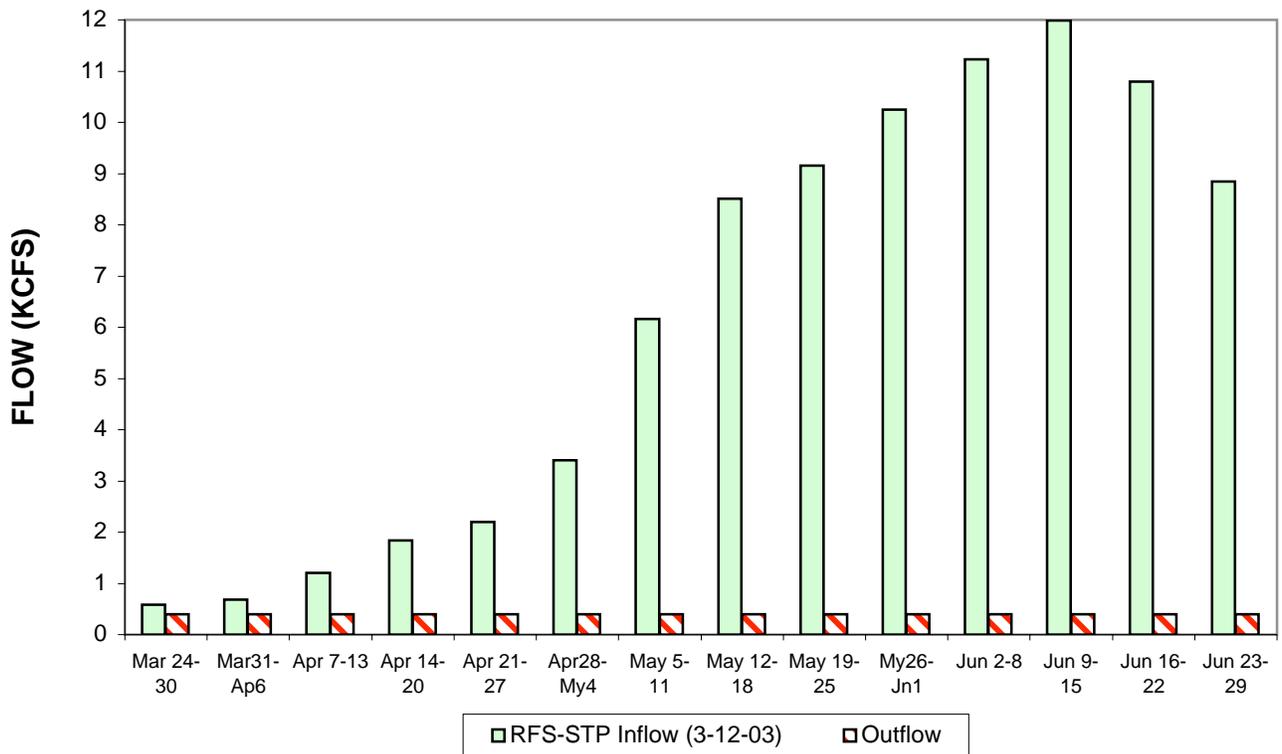
18-Mar-03 WY 2003 SPRING	Outflow (CRITFC) (kcfs)	RFS-STP Inflow (3-12-03) (NWRFC) (kcfs)	Storage Change (KaF)	HGH Pool Elevation (feet) end-of-week Observed:
		Observed: (shaded)		3507.5
Mar 23rd			3	3507.5
Mar 24-30	0.4	0.6	4	3507.5
Mar31-Apr6	0.4	0.7	11	3508.5
Apr 7-13	0.4	1.2	20	3509.5
Apr 14-20	0.4	1.8	25	3510.0
Apr 21-27	0.4	2.2	42	3513.0
Apr28-May4	0.4	3.4	80	3517.0
May 5-11	0.4	6.2	113	3522.5
May 12-18	0.4	8.5	122	3528.5
May 19-25	0.4	9.2	137	3535.0
My26-Jn1	0.4	10.3	150	3542.0
Jun 2-8	0.4	11.2	161	3549.0
Jun 9-15	0.4	12.0	144	3555.0
Jun 16-22	0.4	8.8	117	3559.7
<b>Total (KaF):</b>	<b>72</b>	<b>1,083</b>	<b>1128</b>	



CRITFC Hydro Program

modified VAR-Q

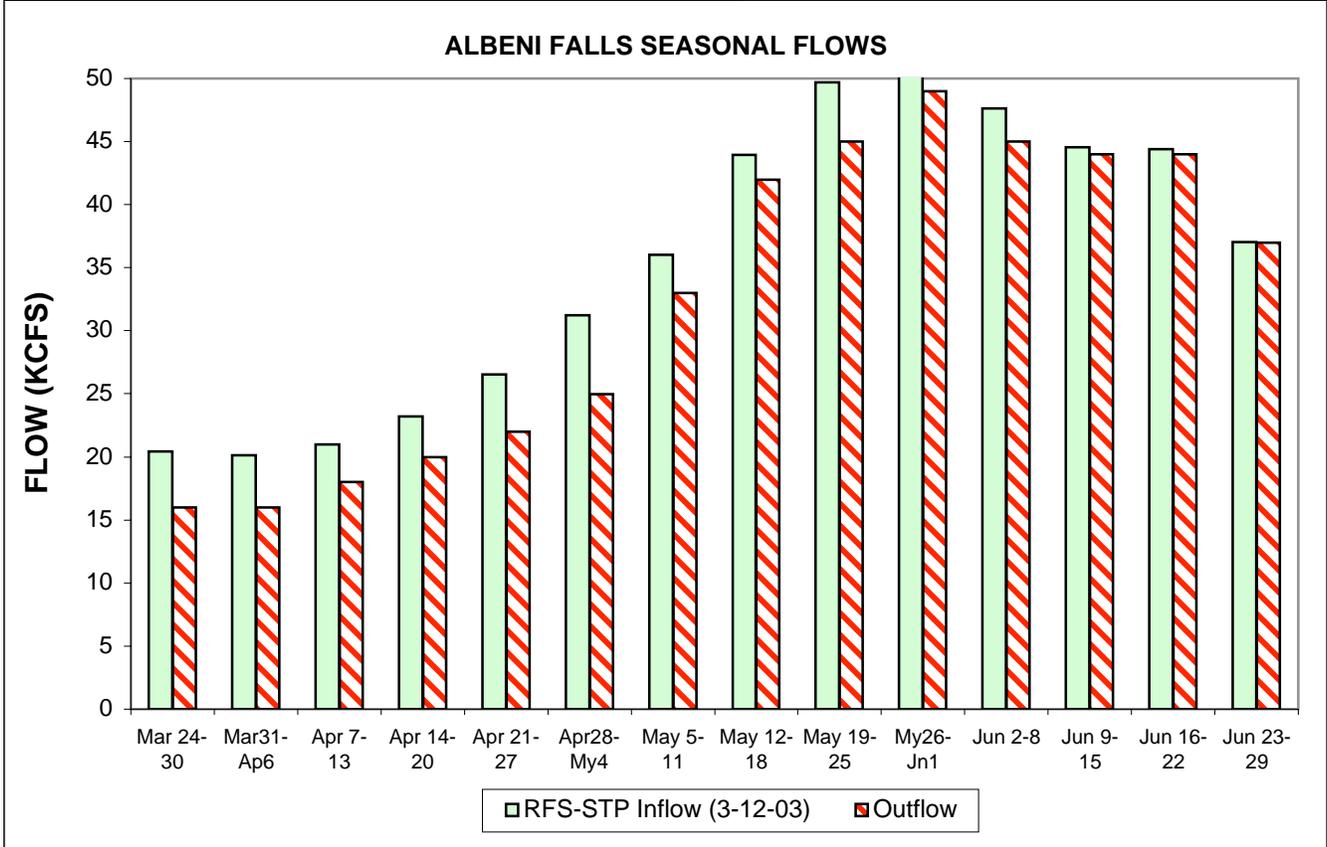
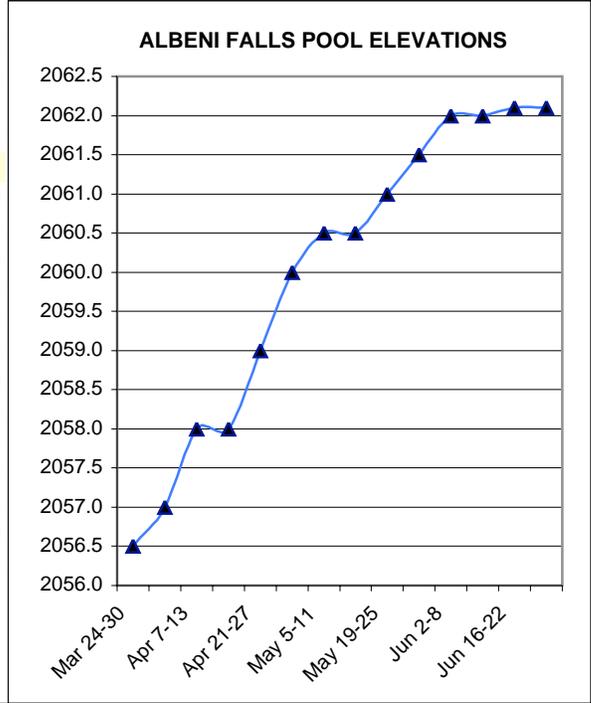
**HUNGRY HORSE SEASONAL FLOWS**



**Pend O'Reille River at Albeni Falls (ALF)**

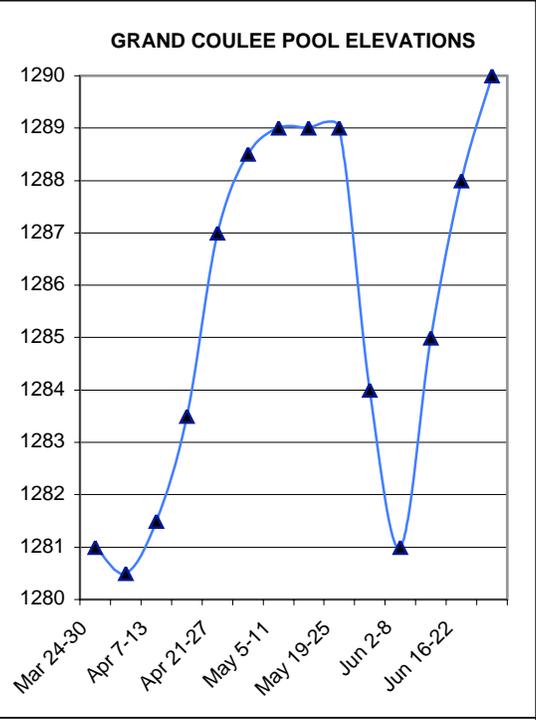
18-Mar-03 WY 2003 SPRING	Outflow (CRITFC) (kcfs)	RFS-STP Inflow (3-12-03) (NWRFC) (kcfs)	Storage Change (KaF)	ALF Pool Elevation (feet) end-of-week Observed:
		Observed: (shaded)		2056.0
Mar 23rd				2056.5
Mar 24-30	16	20.4	62	2057.0
Mar31-Apr6	16	20.1	57	2058.0
Apr 7-13	18	21.0	42	2058.0
Apr 14-20	20	23.2	44	2059.0
Apr 21-27	22	26.5	63	2060.0
Apr28-May4	25	31.2	86	2060.5
May 5-11	33	36.0	42	2060.5
May 12-18	42	43.9	27	2061.0
May 19-25	45	49.7	65	2061.5
My26-Jn1	49	50.6	22	2062.0
Jun 2-8	45	47.6	36	2062.0
Jun 9-15	44	44.5	7	2062.1
Jun 16-22	44	44.4	5	2062.1
Jun 23-29	37	37.0	1	2062.1
<b>Total (KaF):</b>	<b>6,108</b>	<b>6,376</b>	<b>559</b>	

CRITFC Hydro Program



**Columbia River at Grand Coulee (GCL)**

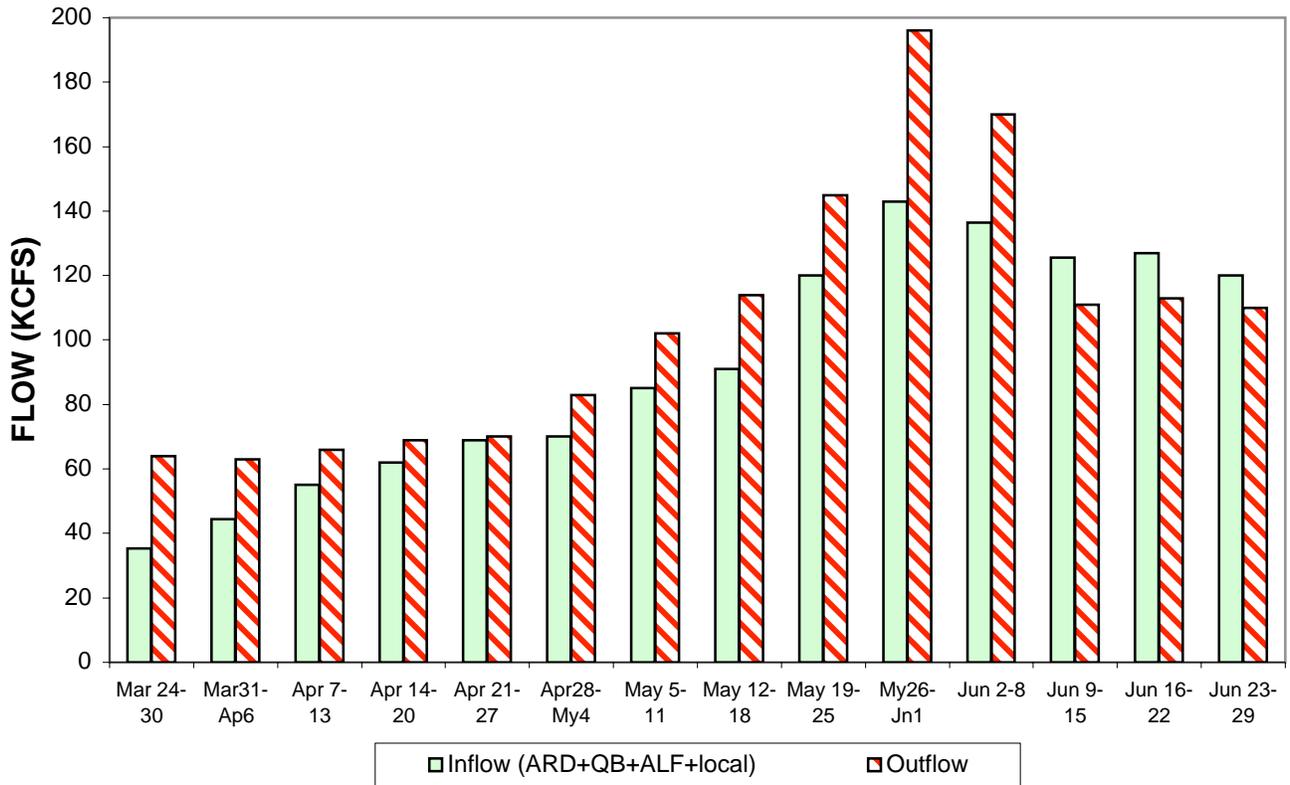
18-Mar-03	Outflow (CRITFC)	Inflow (ARD+QB+ALF+local) (CRITFC)	Long Lake & Kettle R. (kcfs)	Storage Change (KaF)	GCL Pool Elevation (feet) end-of-week Observed:
Mar 23rd					1284.0
Mar 24-30	64	35	13.0	-217	1281.0
Mar31-Apr6	63	45	14.4	-57	1280.5
Apr 7-13	66	55	16.5	76	1281.5
Apr 14-20	69	62	19.3	171	1283.5
Apr 21-27	70	69	20.5	271	1287.0
Apr28-May4	83	70	20.6	105	1288.5
May 5-11	102	85	20.1	43	1289.0
May 12-18	114	91	24.0	14	1289.0
May 19-25	145	120	25.2	3	1289.0
My26-Jn1	196	143	25.2	-386	1284.0
Jun 2-8	170	137	14.5	-263	1281.0
Jun 9-15	111	126	7.9	311	1285.0
Jun 16-22	113	127	3.5	243	1288.0
Jun 23-29	110	120	0.7	149	1290.0
<b>Total (KaF):</b>	<b>19,603</b>	<b>17,333</b>		<b>465</b>	



CRITFC Hydro Program

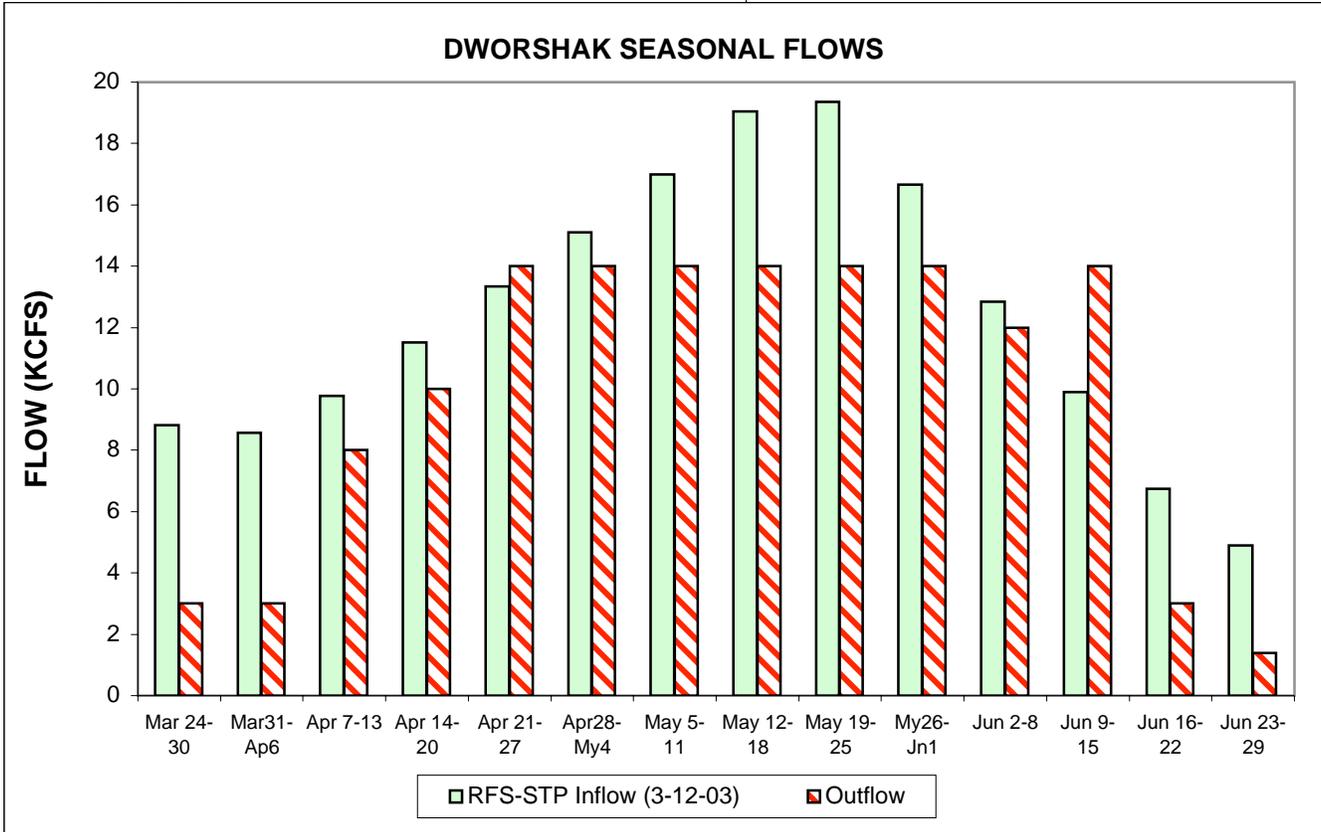
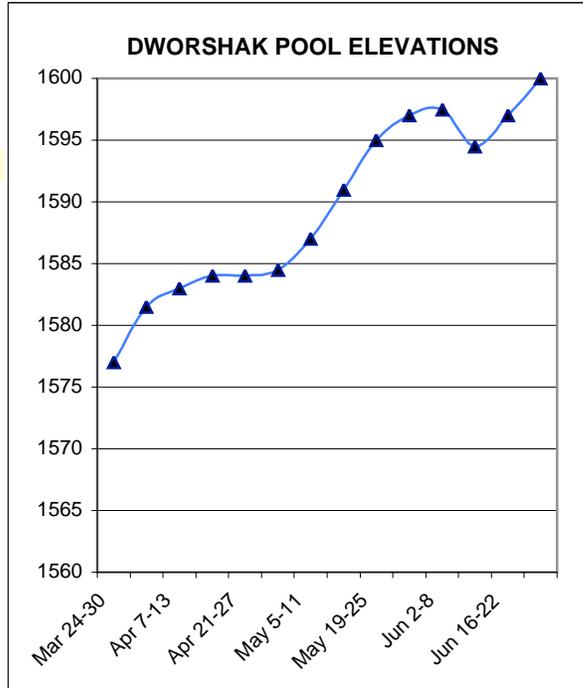
Altered Flood Control

**GRAND COULEE SEASONAL FLOWS**



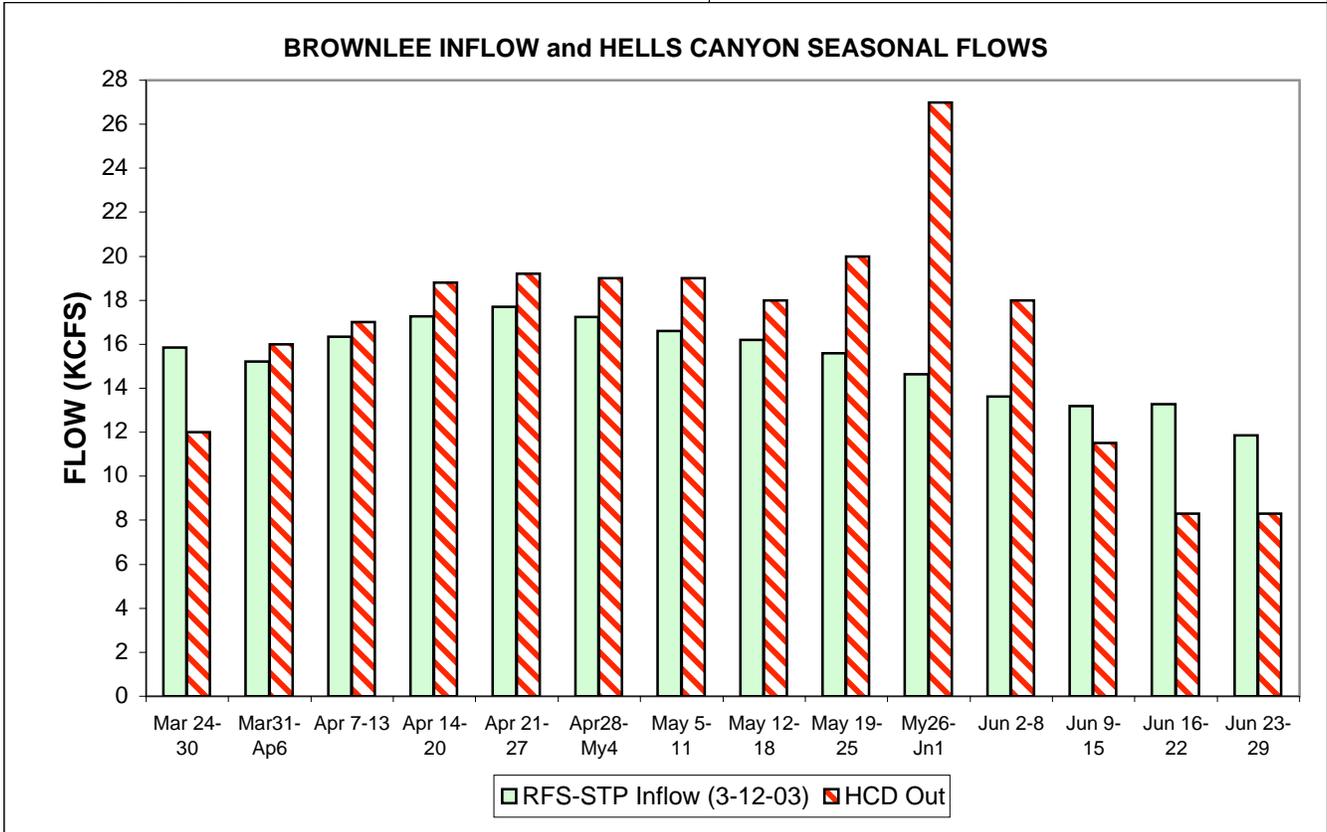
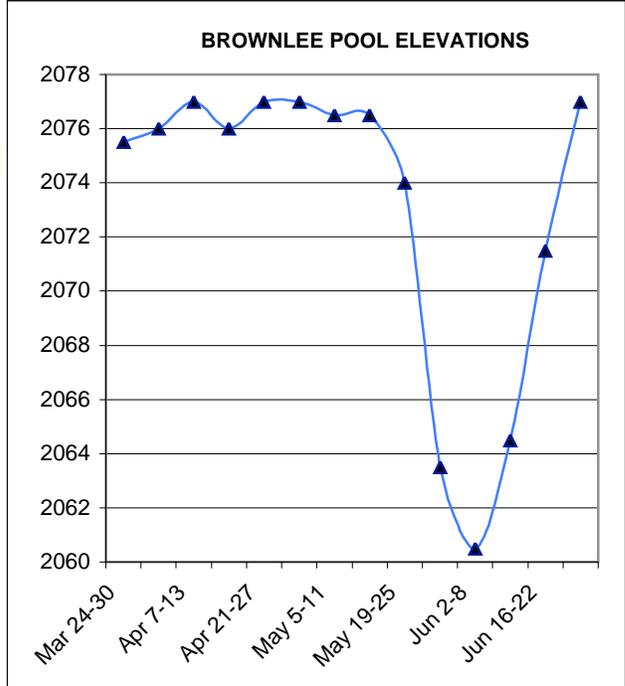
**N.F. Clearwater at Dworshak (DWR)**

18-Mar-03 WY 2003 SPRING	Outflow (CRITFC) (kcfs)	RFS-STP Inflow (3-12-03) (NWRFC) (kcfs)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week Observed:
		Observed: (shaded)		Observed:
Mar 23rd				1572.0
Mar 24-30	3.0	8.8	81	1577.0
Mar31-Apr6	3.0	8.6	77	1581.5
Apr 7-13	8.0	9.8	24	1583.0
Apr 14-20	10.0	11.5	21	1584.0
Apr 21-27	14.0	13.3	-9	1584.0
Apr28-May4	14.0	15.1	15	1584.5
May 5-11	14.0	17.0	41	1587.0
May 12-18	14.0	19.1	70	1591.0
May 19-25	14.0	19.4	74	1595.0
My26-Jn1	14.0	16.7	37	1597.0
Jun 2-8	12.0	12.8	12	1597.5
Jun 9-15	14.0	9.9	-57	1594.5
Jun 16-22	3.0	6.7	52	1597.0
Jun 23-29	1.4	4.9	48	1600.0
<b>Total (KaF):</b>	<b>1,921</b>	<b>2,410</b>	<b>488</b>	



**Snake River at Brownlee (BRN)**

18-Mar-03 WY 2003 SPRING	HCD Out (CRITFC) (kcfs)	RFS-STP Inflow (3-12-03) (NWRFC) (kcfs)	Local (kcfs)	Storage Change (KaF)	BRN Pool Elevation (feet) end-of-week
		Observed: (shaded)			Observed:
Mar 23rd					2070.0
Mar 24-30	12	15.8	1.5	74	2075.5
Mar31-Apr6	16	15.2	1.5	10	2076.0
Apr 7-13	17	16.4	1.5	12	2077.0
Apr 14-20	18.8	17.3	1.5	0	2076.0
Apr 21-27	19.2	17.7	1.5	0	2077.0
Apr28-May4	19	17.2	1.8	1	2077.0
May 5-11	19	16.6	1.8	-8	2076.5
May 12-18	18	16.2	1.9	1	2076.5
May 19-25	20	15.6	2.2	-31	2074.0
My26-Jn1	27	14.6	2.1	-142	2063.5
Jun 2-8	18	13.6	1.8	-36	2060.5
Jun 9-15	11.5	13.2	1.87	49	2064.5
Jun 16-22	8.3	13.3	1.7	93	2071.5
Jun 23-29	8.3	11.9	1.7	73	2077.0
<b>Total (KaF):</b>	<b>3,056</b>	<b>2,815</b>		<b>96</b>	
CRITFC Hydro Program				<i>Altered Flood Control</i>	



**Snake at Lower Granite (LWG)**

18-Mar-03

**WY 2003  
SPRING**

	2001 Obs. Observed (kcfs)	Federal Plan (kcfs) Observed (shaded)	CRITFC Outflow (kcfs)	Component Totals:
Mar 23rd				42
Mar 24-30	37.7	45.4		45
Mar31-Apr6	35.8	45.8		53
Apr 7-13	29.2	50.4		60
Apr 14-20	29.7	58.0		68
Apr 21-27	36.8	63.5		74
Apr28-May4	57.9	69.6		83
May 5-11	49.5	79.0		96
May 12-18	75.8	91.8		110
May 19-25	66.1	103.7		125
My26-Jun1	62.6	114.3		120
Jun 2-8	43.9	115.7		117
Jun 9-15	40.0	114.5		84
Jun 16-22	32.3	93.2		64
Jun 23-29	26.3	70.3		

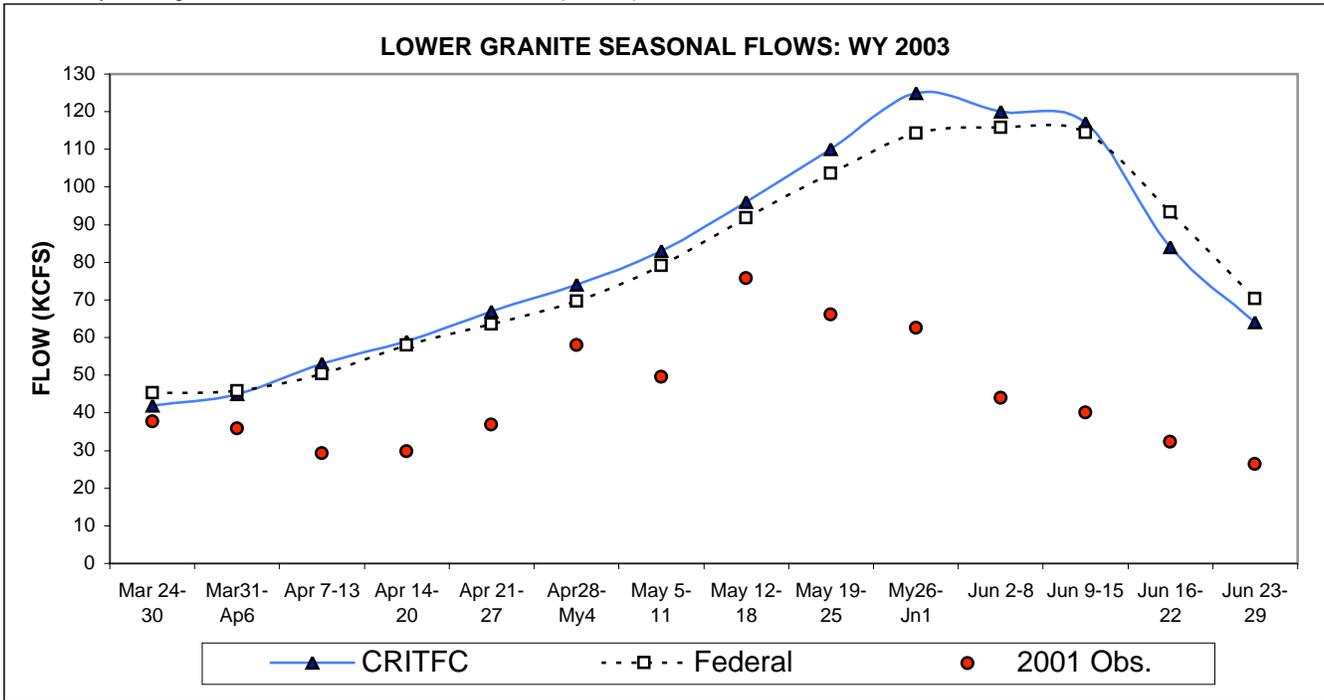
Grand Ronde R. at Troy & Local (kcfs) Observed (shaded)	Clearwater River at: DWR (CRITFC) (kcfs)	River at: Orofino (kcfs) Observed (shaded)	Salmon at: Whitebird (kcfs) Observed (shaded)	Snake at: Hells Canyon (CRITFC) (kcfs)
8.3	3	11.0	7.4	12
8.4	3	10.5	7.2	16
9.0	8	12.3	6.9	17
9.6	10	15.0	6.2	18.8
9.9	14	19.2	5.9	19.2
10.3	14	23.1	7.5	19
9.8	14	26.2	14.4	19
10.1	14	31.4	22.0	18
10.5	14	35.5	29.9	20
10.6	14	36.7	37.0	27
10.3	12	36.1	43.5	18
10.6	14	31.5	49.1	11.5
9.4	3	23.7	39.9	8.3
7.3	1.4	18.5	28.0	8.3

APR - JUN: (in KaF)	8,134	14,853	15,229	Sum Total: 15,249
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Tributary Monthly Totals (KaF):				
1,745	1,880	4,438	4,131	3,056

CRITFC Hydro Program

RFS-STP Inflow (3-12-03)



**Columbia River at Priest Rapids (PRD)**

18-Mar-03

**WY 2003  
SPRING**

	2001 Obs. Observed (kcfs)	Federal Plan (kcfs) Observed (shaded)	CRITFC outflow (kcfs)	Component Totals:
Mar 23rd				70
Mar 24-30	60.0	90.3		70
Mar31-Apr6	68.3	74.3		70
Apr 7-13	76.6	87.6		73
Apr 14-20	68.4	107.8		77
Apr 21-27	68.0	109.0		79
Apr28-May4	69.5	110.7		93
May 5-11	56.3	113.6		115
May 12-18	46.6	118.5		132
May 19-25	52.1	124.7		169
My26-Jun1	79.8	129.5		225
Jun 2-8	97.1	132.0		201
Jun 9-15	89.3	130.4		145
Jun 16-22	98.4	124.9		139
Jun 23-29	95.4	109.9		129

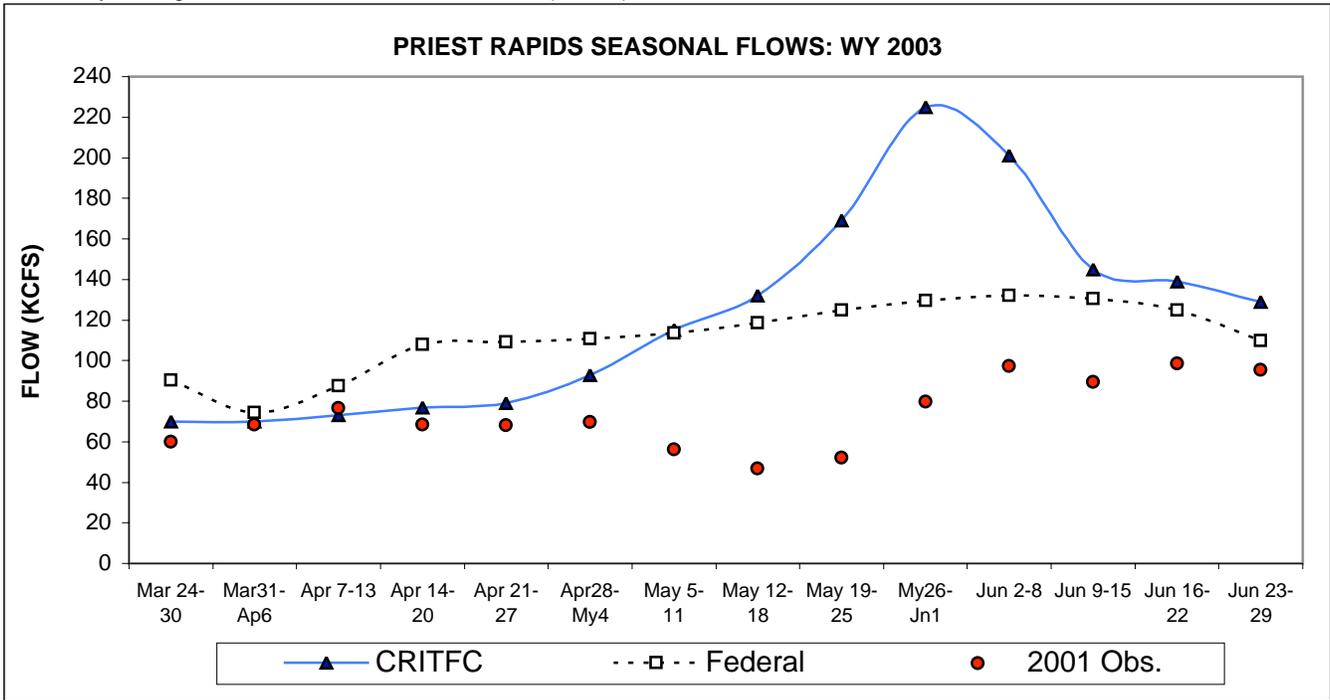
Wenatchee at Peshastin (kcfs)	Lake Chelan (kcfs)	Methow at Pateros (kcfs)	Okanogan Tonasket (kcfs)	Columbia at Coulee (CRITFC) (kcfs)
Observed (shaded)	Observed (shaded)	Observed (shaded)	Observed (shaded)	
1.9	2.2	0.6	1.5	64
2.2	2.2	0.8	1.4	63
2.5	2.2	1.0	1.4	66
2.6	2.2	1.0	1.8	69
3.0	2.2	1.0	2.6	70
3.5	2.2	1.2	3.5	83
4.8	2.2	1.7	4.6	102
6.5	2.2	3.1	6.3	114
8.2	2.2	4.7	9.0	145
9.5	2.2	5.8	11.1	196
10.2	2.2	6.1	12.6	170
9.3	6.6	5.4	12.5	111
7.4	4.2	4.2	10.5	113
5.5	2.2	3.3	8.3	110

APR - JUN: (in KaF)	13,408	20,451	22,865	Sum Total: 21,993
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Tributary Monthly Totals (KaF):				
1,045	486	544	1,190	18,728

CRITFC Hydro Program

RFS-STP Inflow (3-12-03)





# OUTFLOW SUMMATION AND BALANCE

18-Mar-03

	Lower Columbia		Lower Snake		Upper Columbia									
	TDA	local	LWG	BRN	DWR	PRD	GCL	ARDB	Queens Bay	LIB	ALF	ALF	Local	HGH
(kcfs)	130	18	42	12.0	3.0	70	64	10	9	4	16	16	16	0.4
Mar 24-30	130	15	45	16.0	3.0	70	63	20	9	4	16	16	16	0.4
Mar31-Apr6	140	14	53	17.0	8.0	73	66	30	7	4	18	18	18	0.4
Apr 7-13	150	14	59	18.8	10.0	77	69	35	7	4	20	20	20	0.4
Apr 14-20	160	14	67	19.2	14.0	79	70	39	8	4	22	22	22	0.4
Apr 21-27	180	13	74	19.0	14.0	93	83	35	10	4	25	25	25	0.4
Apr28-May4	210	12	83	19.0	14.0	115	102	32	20	4	33	33	33	0.4
May 5-11	240	12	96	18.0	14.0	132	114	19	30	4	42	42	42	0.4
May 12-18	290	11	110	20.0	14.0	169	145	35	40	4	45	45	45	0.4
May 19-25	360	10	125	27.0	14.0	225	196	60	34	4	49	49	49	0.4
My26-Jun1	330	9	120	18.0	12.0	201	170	58	34	4	45	45	45	0.4
Jun 2-8	270	8	117	11.5	14.0	145	111	46	36	8	44	44	44	0.4
Jun 9-15	230	7	84	8.3	3.0	139	113	45	38	18	44	44	44	0.4
Jun 16-22	200	7	64	8.3	1.4	129	110	46	37	24	37	37	37	0.4

- Mica min: 0.1 - 10 kcfs
- Arrow min: 5 - 10 kcfs
- Libby min: 4 kcfs
- Hungry Horse min: 0.5 kcfs
- Queens Bay min: 5 kcfs
- Queens Bay max: 38 kcfs
- Brownlee max: 25 kcfs
- Hells Canyon max: 32 kcfs

**TECHNICAL MANAGEMENT TEAM  
MEETING NOTES  
March 19, 2003  
CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE  
PORTLAND, OREGON**

**TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>**

***1. Greeting and Introductions***

The March 19, 2003 Technical Management Team meeting was chaired by Cindy Henriksen of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3945.

***2. TMT Process Follow-Up.***

David Wills of USFWS said the consensus at yesterday's FPAC meeting was that the TMT should continue to meet on Wednesday mornings; we will look forward to receiving the single-trace process (STP) runs on Tuesday afternoon or Wednesday morning, Wills said. That works for us, said BPA's Scott Bettin. The TMT meetings will be held from 9 a.m. to noon every other Wednesday, with the odd weeks held open as a placeholder for conference calls or face-to-face meetings on an as-needed basis.

***3. 2003 Water Management Plan (WMP) Update.***

The Corps' Scott Boyd reported that there are few drastic changes to the 2003 WMP; the most recent water forecasts either stayed the same or went down slightly, depending on the basin. Based on the forecast, which shows a January-July runoff volume of 14.7 MAF at Lower Granite, it doesn't appear that we will be spilling at the Lower Snake projects this spring, he said, although spill testing at the various Lower Snake projects is still under discussion.

Paul Wagner of NOAA Fisheries said he has drafted a description of planned FCRPS research for inclusion in the 2003 WMP; however, there is still some ongoing discussion about how, or whether, research should be addressed in this document. We can discuss it further at the next TMT meeting, he said. Henriksen said it was her understanding that research will be addressed in the five-year WMP, not the annual WMP. It's pretty benign language, said Wagner; the intent is simply informational, so that people understand what research is planned at each of the FCRPS projects, and what the implications of that research on flow and spill might be.

***4. Bonneville Spill Study.***

There was no presentation on this topic at today's meeting.

***5. Chum.***

Ron Boyce of ODFW said chum fry are continuing to emerge and to be caught in the Ives Island area – 94 at the 12 seining sites yesterday, plus 196 chinook. Numbers have continued to increase since February 28, which tracks with the results from previous years; chum will likely continue to emerge through the first week in May. Peak numbers are expected to be seen in April. The chum caught yesterday averaged 41 mm in length. WDFW’s Shane Scott said that, at I-205/Multnomah, chum are being caught at a rate of about 60 fish per location. Wills added that Oregon chum seining information is now being posted weekly to the Fish Passage Center website, as is information on Hardy Creek/Hamilton Springs chum outmigration. We hope to get some past year information up on the website soon, he added.

You expect chum emergence to continue through May? Bettin asked. That’s correct, Boyce replied – we’ll need to monitor the status of the chum emergence and Bonneville tailwater elevation on a weekly basis. We are in a low water year, the Bonneville tailwater elevation is something we’d like to keep a close eye on, said Bettin.

## ***6. NOAA Science Center Transport Study.***

Wagner introduced John Williams from NOAA’s Northwest Fishery Science Center, who was present today to discuss the results from the last five years of transport survival studies in the Lower Snake River. Williams’ presentation is hot-linked to today’s agenda on the TMT homepage; please refer to this document for full details.

Williams began with a table titled “Wild Spring/Summer Chinook Marking Above Lower Granite Dam, 1995-2000.” The table included information on return rates, the number of adults in the study, in-river smolt-to-adult return rate estimates for each group, the estimated percentage of non-detected (spill-passed, turbine-passed and bypassed fish) in each year, the number of adults returning from the non-detected juveniles, the rate of return for transported fish vs. in-river fish, and a 95% confidence interval estimate of the rate of return for transported vs. in-river fish. The smaller the number of returning adults, the greater the uncertainty, Williams noted. And the SAR data is back to Lower Granite? Boyce asked. Correct, Williams replied, adding that the geometric mean transport/in-river (T/I) survival ratio is 1.03 for this first group of fish. That means the SARs are approximately equal for the transported and in-river wild spring/summer chinook marked above Lower Granite? Mike O’Bryant asked. Correct, Williams replied, although the confidence interval of 0.68-1.57 creates significant uncertainty about that number.

Williams then moved on to the same information for wild spring/summer chinook marked at Lower Granite Dam in the years 1995-2000; the geometric mean for these fish was 1.30, with a confidence interval of 0.87-1.95. Other tables presented by Williams included:

- Hatchery spring/summer chinook marked above Lower Granite Dam (geometric mean T/I: 1.35; C.I. 1.10-1.65)
- Hatchery spring/summer chinook marked at Lower Granite Dam (geometric mean T/I: 1.33, C.I. 1.10-1.59)
- Wild steelhead marking above Lower Granite Dam (geometric mean T/I: 1.13, C.I. 0.58-2.23)
- Wild steelhead marking at Lower Granite Dam (geometric mean T/I: 1.85, C.I. 1.24-2.77)

- Hatchery steelhead marking above Lower Granite Dam (geometric mean T/I: 1.01, C.I. 0.61-1.69)
- Hatchery steelhead marked at Lower Granite Dam (geometric mean T/I: 1.43, C.I. 1.23-1.66)

The bottom line is that the confidence bounds for some groups of steelhead do exceed 1, but are not much greater than 1, Williams said – in other words, there isn't a great deal of confidence in what we'll get from year to year in terms of the SARs for the transported vs. in-river fish.

Williams then moved on to a discussion of the "D" value, the differential survival of transported fish compared to non-transported fish downstream from Bonneville Dam; he provided a table of "D" values for the wild and hatchery spring/summer chinook and steelhead marked at and above Lower Granite Dam. Essentially, the "D" value is one way of accounting for why the return rate of transported fish is not as high as expected in comparison to the survival rate for in-river fish, based on the percentage of transported fish surviving to below Bonneville Dam, Williams explained. The bottom line is that we know there is something in barge transportation that is causing the transported fish to die at a rate higher than the fish that are migrating in-river, Williams said; at this point, we don't know what is causing that differential survival.

How long will it take you to process the 2001 and 2002 data? Bettin asked. We should have that fairly quickly, once we have adult return information from 2003, Williams replied – we should be able to complete the analysis for spring/summer chinook by some time in August. And will you be doing the same research in 2003? Bettin asked. Yes, Williams replied, adding that the data that has been collected in recent years suggests that there may be temporal optimizations that can be accomplished within the season. Fish transported early in the season might do better than in-river fish, for example, while it may make sense to allow more fish to migrate in-river when flows are higher. In other words, he said, transportation it may not be a simple on/off decision based on seasonal average flow. Wagner added that this data bears out Pettit's contention that any juvenile steelhead arriving at Lower Granite after May 15 basically have no chance of surviving in-river.

### ***7. IDFG Transport Study.***

No IDFG presentation was provided at today's meeting. It was agreed to discuss this topic at the April 2 TMT meeting.

### ***8. CGS Update.***

Everything went well with the bearing replacement; the Columbia Generating Station is now back on line, Bettin said. Henriksen noted that Dworshak outflow was increased to 4.5 Kcfs to make up for lost generation during the repair; last week's rain event helped shorten the duration of the increase in Dworshak outflow. By March 10, we were able to reduce Dworshak

outflow to minimum, a little sooner than expected, she said; in all, we used about 1.8 feet in Dworshak storage. Inflows to the project shot up to 15 Kcfs during the precipitation event, so we were able to recapture that storage fairly quickly, Henriksen added, noting that Lower Snake flows increased from 23 Kcfs to as much as 70 Kcfs at Lower Granite last week. Reclamation's Tony Norris said Grand Coulee elevation, which had gone as low as 1283.6 feet last week, is now back up to 1284, so the impacts of the outage on Grand Coulee elevation were minimal.

### ***9. Start of Spill on Snake River.***

Prior to today's meeting, the Corps developed two Q-Adjust runs, MR-1 and MR-2, said Henriksen; MR-1 shows the default BiOp operation, while the other shows a slightly different Grand Coulee operation – MR-2 meets the 70 Kcfs at Priest Rapids through April 10, then goes to 100 Kcfs, rather than 135 Kcfs, at Priest Rapids after that. Basically, MR-2 puts more water into April, then Grand Coulee refills during June, resulting in lower flows later in the spring season, Wagner said. Both runs are based on the March final water supply forecast, Henriksen added. The objective to see how often, based on the 59-year historical record, we were able to meet the seasonal flow objectives at McNary and Lower Granite, she said.

At Lower Granite, this shows that the average flow for all of the periods, none of the average flows are as high as 85 Kcfs, she said. However, using last week's STP runs, average flow came out at 86 Kcfs, said Wagner – it depends on what assumptions you use. Correct, said Henriksen – there was quite a large increase in the volume in last week's STP run – to 16 MAF. However, this is still a forecast of runoff volume at Lower Granite in 2003, Henriksen said – what this tells us is that if we assume 14 MAF, this isn't going to work.

Who develops the volume used in the STP runs? Wagner asked. That's a River Forecast Center product, Henriksen replied – it's based on a 10-day forecast of precipitation and streamflow; and we've seen a lot of precipitation in the last 10 days, skewing the forecast upward. We do have some concern about the magnitude of the volume in the streamflow forecast compared to the water supply forecast, she said; particularly at Dworshak, we're seeing streamflows well above normal, but that doesn't necessarily translate into more snowpack and storage for use later – in other words, this may be some of our spring runoff now.

So we know the STP volume isn't accurate? Wagner asked. Correct, Henriksen replied. How do we know which forecast is accurate? Wagner asked. We need to look at the March mid-month forecast, Henriksen said; then we need to talk about what we're going to use as our criterion for future decision-making. The mid-month forecast is coming out later this week, she said; we can re-run Q-Adjust to see what that does to our seasonal average flow assumptions. So the action agencies' recommendation at this point is not to begin spill at Lower Granite, Little Goose and lower Monumental at this time, then? Silverberg asked. That's correct, Henriksen replied.

I don't view the decision as that cut and dried, said Boyce – I think we need to look at the most up-to-date possible information, and reassess the Lower Snake spill operation week-to-week based on flow, precipitation and fish movement information. I don't want to be locked into a no-spill decision at today's meeting, he said. That's fine, said Bettin, but for planning purposes,

right now, we're saying spill would not start on April 3 at those three projects, based on the language in the BiOp. There is flexibility in the BiOp, however, said Boyce – it specifically allows for in-season management flexibility. True, but not if the Lower Granite runoff forecast is 14.7 MAF, Bettin replied – the threshold is clearly 16 MAF. The other question is whether we have enough fish in the system to begin spilling at Ice Harbor on April 3, Bettin said – we'll need to discuss that at our April 2 meeting.

Obviously, everything hinges on the runoff volume you assume, said Wagner; the current Corps Q-Adjust forecast doesn't take into account the significant precipitation that has occurred throughout the basin in March. Let's continue to discuss this, said Boyce, and come to the April 2 meeting prepared for an in-depth discussion. And what should people be looking at between now and then? Silverberg asked. Water supply forecast and fish movement data, Wagner replied. In response to another question from Silverberg, Henriksen said the Corps will re-run the Q-Adjust model using an the mid-month forecast when it is available. I assume FPAC will continue to discuss this issue? Silverberg asked. Correct, Wills replied – if we could have the mid-month Q-Adjust and a 16 MAF Q-Adjust in time for our April 1 meeting, that would be very helpful.

Do you have a coordinated refill number for August 31? one participant asked. We expect to be 20 feet from full at Libby and Hungry Horse, and 12 feet from full at Grand Coulee, Bettin replied.

Boyd noted that, at NMFS's recommendation, he had inserted a table in the 2003 Water Management Plan showing a modified Lower Monumental spill program during low-flow years. If river flow is below 75 Kcfs, we would spill 50% of total river flow. At 75 Kcfs to 100 Kcfs, we would spill 45% of total river flow. Over 100 Kcfs, we would spill 50% of total river flow or to the gas cap. Basically, at NMFS' request, if river flow is below 75 Kcfs, spill won't always be up to the gas cap, Bettin said. We had been asked to provide the rationale for that recommendation, said Wagner, and plan to do so – it's based on tailrace egress conditions. Wagner added that Bill Hevlin and Steve Rainey have been asked to develop a written explanation of NMFS' recommendation; we'll have a presentation and more discussion on this issue at the April 2 TMT meeting, he said.

Can you summarize the conclusion of the spill/no spill discussion? asked Michele DeHart. For planning purposes, Silverberg replied, the decision right now is not to spill at the Lower Snake projects; if flow, water supply and fish movement conditions change between now and April 2, we will revisit that planning decision. And I also understood Paul Wagner to say that NMFS will be providing a written explanation of its recommendation to reduce spill at the Lower Snake projects under certain conditions at the April 2 TMT meeting? DeHart asked. We have requested a presentation on that topic, yes, Wagner said. We do need some further coordination and discussion on any projects for which spill reductions are contemplated, said Boyce. Bettin reiterated that the table laying out the proposed changes to the Lower Monumental spill volumes is included in the 2003 WMP. Boyce said that, in his view, a change of this magnitude deserves full coordination; that coordination has not yet occurred. Again, we'll discuss it in detail on April 2, said Silverberg.

With respect to Ice Harbor spill research, Rebecca Kalamascz said that the planned

research activities at Ice Harbor will occur regardless of the spill/no spill decision at the other Lower Snake projects. At Lower Granite, the RSW research would include a reduced spill season to get the information needed in 2003; that would include some training spill at 19 Kcfs, as well as a summer test. At Ice Harbor, we're talking about a comparison between BiOp spill operations and 50% spill, a range of operations intended to provide good streaming flows through the tailrace in both spring and summer, Kalamascz said.

#### ***10. CRITFC 2003 River Operations Plan.***

CRITFC's Kyle Martin noted that the CRITFC 2003 River Operation Plan is hot-linked to today's agenda on the TMT homepage. He reminded the group that, for the past several years, the CRITFC tribes have developed their own river operations plan; he said his intent today was simply to inform the group of what is included in CRITFC's 2003 plan. We welcome any comments the action agencies and salmon managers may have, Martin added.

Essentially, we would like to see a naturally peaking hydrograph, he said; CRITFC is working with a different water supply forecast, based on CRITFC's correction curve methodology; we're anticipating 68 MAF, rather than 75 MAF, in observed flow at The Dalles during 2003, Martin said. We're offering our own flow, spill and flood control recommendations based on that water supply forecast, he said; we would like to see them implemented this year, and if you could provide any written comments you may have by April 10, that would be greatly appreciated.

In response to a question from Henriksen, Martin said CRITFC is recommending somewhat higher flood control elevations than those the Corps is targeting, currently; we would then release that additional flood control volume during the peak migration period in the spring, he said. It would be nice if we had more water to work with, he said, but at the same time, we don't want to jeopardize refill at Grand Coulee and Dworshak. Does your plan have the flow going below 70 Kcfs at Vernita Bar? Bettin asked. No, Martin replied – again, we're trying to balance the limited water we have available this year. We feel this is a better plan for salmon, he said, adding that it has been endorsed by all four CRITFC member tribes. It includes 877 KAF out of the Upper Snake, plus 0.5 MAF from Canadian storage and 260 KAF from Banks Lake. Please submit your comments directly to Bob Heinith, Martin added.

#### ***11. Current System Conditions.***

There are now adult fish at Bonneville, said Wagner; more than 900 adult chinook passed the project on March 16, and 1,537 have passed to date, which is a lot – the timing is much earlier than usual, compared to the 10-year average. Our harvest management people went back 30 years, said Boyce, and this is the highest spring chinook count for this date in the 30-year record. There have also been high early counts of adult steelhead at Lower Granite, Boyd observed. However, be cautious about these early numbers, said DeHart – the January 1-March 14 data doesn't necessarily mean a lot, and we need to wait and see how the season plays out.

Moving on to current hydrologic conditions, Henriksen said there is little new to report; the storage projects continue on minimum outflow. Libby will release minimum outflow for the

next two weeks; the project is currently at elevation 2404 and drafting, and is not expected to meet its April 10 flood control elevation target. Dworshak is at elevation 1566 and filling; the current STP run shows that we may have to pick up Dworshak outflow slightly if heavy precipitation continues. Norris reported that Hungry Horse is at elevation 3507.8 feet and filling slightly, with discharge of less than 1 Kcfs. The March final USBR forecast for Hungry Horse is 1.534 MAF, which sets the Columbia Falls minimum at 3.372 Kcfs, and the Hungry Horse minimum project discharge at 687 cfs. Norris added that Grand Coulee is at 1283.9 feet, currently, and is releasing discharge approximately equal to the 70 Kcfs Vernita Bar minimum.

Have we explored a Dworshak/Grand Coulee shift for this year? Wagner asked. It looks as though we might be able to fill an extra five feet at Dworshak in exchange for a foot of Grand Coulee storage in 2003, Henriksen replied; we're happy to continue to explore that, depending on what's best for fish.

The power system is back to normal, said Bettin.

The only other thing is that the most recent water supply forecast at Libby is 4.1 MAF, said Henriksen; that puts us in the low-volume range in which we would not supply a sturgeon pulse in 2003 (4.6 MAF is the minimum volume under which a sturgeon pulse would occur). Again, we are planning not to start spill at Lower Granite, Lower Monumental and Little Goose on April 3, pending further discussion at the April 2 TMT meeting, Henriksen added.

## ***12. New System Operational Requests.***

On March 18, the salmon managers submitted SOR 2003-03. This SOR, supported by USFWS, IDFG, CRITFC, ODFW, WDFW and NMFS, requests the following specific operation:

- Beginning March 19, and continuing on March 20, operate the Dworshak Dam powerhouse at a level between 4.5 Kcfs and 6.5 Kcfs beginning at 5 p.m. and ending at 5 a.m. the following morning.

The full text of this SOR is available as a hot link to today's agenda on the TMT website; please refer to this document for full details and justification.

Wills spent a few minutes going through the specific operations and justification included in this SOR; he noted that the releases from Dworshak are intended to support the spring chinook releases from Dworshak National Fish Hatchery. At minimum discharge from Dworshak, the fish fall onto rip-rap when they're released, Pettit explained, hence this request for higher flows. Minimum Dworshak discharge also produces a backwater area with very poor egress conditions, Wills added – we're trying to produce a little stronger push to get these fish out of the North Fork and into the mainstem.

Would it be acceptable to release a slightly higher flow for six or eight hours, rather than a lower flow for 12 hours? Bettin asked. In other words, we would release the same volume from Dworshak, but over a slightly shorter period. I think that would be acceptable, Wills replied, but I should check with the hatchery manager. In response to a question from Boyce, Bettin said

Bonneville's preference would be to release a higher volume of water earlier in the evening (before midnight), when the energy is worth more. The Corps also has some ramp rate and unit availability questions, Henriksen said. However, the bottom line is that the SOR appears doable, said Bettin; we just need to work out the details.

Pettit said similar operations were coordinated for years between Dworshak National Hatchery management and the project operators; in his view, in future years, such an operation shouldn't require an SOR. True, said Bettin, but the problem is that Dworshak is at minimum discharge, and this is a low water year. We're fine with this operation, as long as NMFS agrees that any impacts of this operation on Dworshak's April 10 refill elevation are acceptable, he said. There was general TMT agreement that this arrangement could be applied to obviate the need for future SORs in support of the Dworshak Hatchery releases -- it may be possible to simply insert language to this effect into the annual Water Management Plan. Again, we're OK with the volume of water, said Bettin, and just need to work out the shape of the Dworshak release.

After a break, Wills said he had checked with the hatchery manager, who said higher flow for a shorter period would not be detrimental; he did request that the increased flows continue through midnight, perhaps with some sort of ramping rate. Henriksen said she will coordinate the specifics of the operation. Wills clarified that the higher Dworshak outflow over a shorter period is not optimal, from the salmon managers' perspective, but they are willing to accede to Bonneville's request if that's better for BPA. We'll concentrate the flow into the 5 p.m.-midnight period, Bettin said.

### ***13. Recommended Operations.***

Henriksen said that, at Dworshak, the operation will be to ramp up to 3.7 Kcfs at 4 p.m. this afternoon, then to 6.9 Kcfs by 5 p.m.; that rate of discharge will be held through 11 p.m., after which flow will be ramped down to 3.7 Kcfs for one hour. We'll be back at minimum discharge by 1 a.m. The same operation will take place tomorrow night, she said. This is expected to reduce Dworshak storage by 0.5-0.75 feet for the two nights combined, she added.

### ***14. WQT Recommendation on Chief Joseph/Grand Coulee Spill/Generation Swap.***

Water Quality Team chair Mark Schneider said there had been a meeting a couple of months ago initiated by the Washington Department of Ecology; at that meeting the WQT was asked to consider the question of whether a joint Grand Coulee/Chief Joseph operation might be developed that would reduce TDG in the lower river in the absence of Chief Joseph flow deflectors. We formed a WQT subgroup to consider this question, said Schneider; we did develop an operational recommendation, which was subsequently endorsed by the full WQT. He distributed a handout outlining this recommended operation, then spent a few minutes going through its contents:

- Joint operation of Grand Coulee and Chief Joseph is recommended to reduce the average total dissolved gas (TDG) concentrations in the Columbia River above and below Chief Joseph by taking advantage of the larger generation flow capacity of Grand Coulee and the lower average TDG loading below Chief Joseph spillways (even absent deflectors)

- The recommended operation requires avoiding the use of the Grand Coulee outlet works by shifting all spill to Chief Joseph for spill discharges up to 70 Kcfs. If river conditions require spill releases above 70 Kcfs at Chief Joseph, the additional spill should be distributed between Chief Joseph and Grand Coulee in a 2.5:1 ratio
- When Lake Roosevelt is below elevation 1260, spill from the outlet tubes should be avoided by transferring generation to Grand Coulee and accepting increased spill at Chief Joseph.
- When Lake Roosevelt TDG is elevated and at or above elevation 1260, spill over the drum gates at Grand Coulee may be beneficial to the system due to potential degassing
- Study results predict that joint operations will decrease the average TDG saturation in the Columbia River below Chief Joseph and Grand Coulee dams, but increase the localized TDG saturation in an area below the Chief Joseph spillway. If joint operation is pursued, coordination with WDOE will be required for appropriate water quality waivers for the fixed monitoring station below Chief Joseph in order to realize a greater benefit to the system downstream.
- There are other operational measures at Grand Coulee, e.g. drum gate spill and paired outlet works releases, that may provide additional benefits to the TDG saturation in the Columbia River. The continuation of monitoring practices and additional investigations of those operational measures on TDG exchange are recommended to further establish efficient and effective joint operations of Grand Coulee and Chief Joseph Dams.

If this joint operation is implemented, said Schneider, what you'll experience is localized elevated TDG levels in the Chief Joseph tailwater, which will require some coordination with WDOE; however, overall, you would see 1%-3% less gas below Chief Joseph, and 12% lower gas levels in Lake Rufus Woods. We have a waiver for lower river spill? Bettin asked. Correct, said Schneider. Could we incorporate the Chief Joseph operation into that permit? Bettin asked. The permit in past years has been for voluntary spill for fish passage, Henriksen replied. Doesn't this year's waiver include Chief Joseph? Wills asked. Yes, it will, Dick Cassidy replied.

What does TMT need to do with this? Silverberg asked. The WQT is offering it as a tool to reduce TDG levels in the lower river, Schneider said; essentially, we believe this joint Grand Coulee/Chief Joseph operation will have TDG benefits in the Lower Columbia, if spill occurs this year. So we would incorporate this in the spill priority list? Bettin asked. Correct, Schneider replied – it's a relatively minor adjustment. Is the larger WQT subgroup report available on the WQT homepage? Bettin asked. I'll make sure it is, Schneider replied.

**B. Special McNary Operation.** Bettin said that Bpa on behalf of the action agencies would like to draft McNary pool by 2.5 feet over the next two days to accommodate the placement of rip-rap around the transmission tower downstream from the project. In order to do that without spill, said Bettin, we would like to be able to go outside 1% peak efficiency at McNary, given the fact that there are no juveniles in the river at this time. Both McNary and John Day need to be empty; we would then need to refill McNary over the weekend. And the operation would start today? Boyce asked. Correct, Bettin replied.

What about the impacts of the operation on adult fallback? Pettit asked. Flows would be higher today and tomorrow, then lower over the weekend, Bettin replied. It would be helpful if

you could outline the specific operational requirements for this operation, said Boyce. We would need to run all 14 units at McNary at full capacity, increasing discharge from McNary from the current 160 Kcfs to 210 Kcfs, allowing us to evacuate 2.5 feet from McNary over the next two days without having to spill, Bettin replied.

After a brief discussion, no TMT objections were raised to this operation, although Boyce did observe that there are some juveniles and adults present in the system. The preference is not to do this operation now, but there are no strong objections to the operation on the part of the salmon managers. Can we continue the operation through midnight on Sunday, to allow us to refill John Day? Bettin asked. That would be fine, Wagner replied.

***15. Next TMT Meeting Date.***

The next face-to-face meeting of the Technical Management Team was set for Wednesday, April 2 at 9 a.m. Meeting summary prepared by Jeff Kuechle.

# Wild sp/su chinook salmon marking above Lower Granite Dam

Year	Trans. SAR	No. of adults	In-river SAR	N.D.	No. of adults	T/I	(95%) conf.
1995	0.30	8	0.34	9%	10	0.89	(0.34-2.30)
1996	0.56	2	0.21	24%	5	2.52	(0.47-13.50)
1997	2.10	4	1.82	27%	17	1.16	(0.38-3.56)
1998	1.14	15	1.48	12%	48	0.77	(0.42-1.39)
1999	2.21	48	2.01	10%	104	1.10	(0.77-1.56)
2000	0.50	4	0.91	21%	73	0.55	(0.20-1.54)
Geometric mean (1995-00)						1.03	(0.68-1.57)

# Wild sp/su chinook salmon marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.38	195	0.23	26	1.68	(1.11-2.55)
1996	0.11	9	0.06	3	1.98	(0.52-7.52)
1997	-----	--	-----	---	-----	-----
1998	0.60	34	0.95	28	0.63	(0.37-1.04)
1999	2.10	192	1.35	26	1.55	(1.02-2.36)
2000	0.71	127	0.61	161	1.17	(0.92-1.48)
Geometric mean (1995-00)					1.30	(0.87-1.95)

# Hatchery sp/su chinook salmon marking above Lower Granite Dam

Year	Trans. SAR	No. of adults	In-river SAR	N.D.	No. of adults	T/I	(95%) conf.
1995	0.60	20	0.35	14%	32	1.71	(0.97-3.03)
1996	0.16	6	0.16	24%	32	0.95	(0.39-2.32)
1997	0.78	233	0.65	24%	185	1.21	(1.00-1.48)
1998	1.30	885	1.15	13%	336	1.13	(1.00-1.29)
1999	2.54	1,203	1.68	17%	736	1.51	(1.37-1.66)
2000	1.93	1,021	1.08	30%	621	1.79	(1.61-1.98)
Geometric mean (1995-00)						1.35	(1.10-1.65)

# Hatchery sp/su chinook salmon marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.54	471	0.32	123	1.68	(1.37-2.06)
1996	0.13	47	0.10	26	1.24	(0.76-2.02)
1997	-----	----	-----	----	-----	-----
1998	0.62	253	0.57	134	1.09	(0.88-1.35)
1999	1.97	895	1.45	242	1.36	(1.17-1.57)
2000	-----	----	-----	----	-----	-----
Geometric mean (1995-00)					1.33	(1.10-1.59)

# Wild steelhead marking above Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.46	1	0.24	1	1.87	(0.11-31.76)
1996	1.46	2	0.67	5	2.05	(0.38-11.03)
1997	0.82	3	0.76	4	1.08	(0.23-5.01)
1998	0.23	1	1.02	9	0.22	(0.03-1.85)
1999	3.24	12	1.95	23	1.66	(0.81-3.42)
2000	2.67	12	1.93	46	1.38	(0.72-2.66)
Geometric mean (1995-00)					1.13	(0.58-2.23)

# Wild steelhead marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	--	--	--	--	--	--
1998	0.48	4	0.37	7	1.30	(0.37-4.57)
1999	1.42	96	0.54	8	2.61	(1.25-5.47)
2000	2.24	610	1.19	281	1.87	(1.62-2.17)
Geometric mean (1998-00)					1.85	(1.24-2.77)

# Hatchery steelhead marking above Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	0.76	19	0.91	14	0.83	(0.41-1.69)
1996	0.23	4	0.37	17	0.62	(0.20-1.88)
1997	0.35	10	0.18	8	1.94	(0.75-5.03)
1998	0.53	7	0.86	26	0.61	(0.26-1.44)
1999	0.89	12	1.28	41	0.70	(0.36-1.34)
2000	2.22	14	0.88	41	2.53	(1.36-4.73)
Geometric mean (1995-00)					1.01	(0.61-1.69)

# Hatchery steelhead marking at Lower Granite Dam

Year	Trans. SAR	Number of adults	In-river SAR	Number of adults	T/I	(95%) conf.
1995	--	--	--	--	--	--
1996	--	--	--	--	--	--
1997	0.65	2	0.20	11	3.28	(0.70-15.32)
1998	0.53	9	0.41	24	1.29	(0.59-2.82)
1999	1.07	477	0.79	82	1.36	(1.07-1.74)
2000	1.08	12	0.66	61	1.65	(0.87-3.11)
Geometric mean (1995-00)					1.43	(1.23-1.66)

D = differential survival of transported fish compared to non-transported fish downstream from Bonneville Dam

“Differential” from what is expected

If transported juveniles have a 100% (1.0) survival to below Bonneville Dam, and non-transported fish have a 50% (0.5) survival through the hydropower system, then with equal survival below Bonneville Dam, we would see twice as many adult returns from transported fish (if we started with the same number of juveniles at the top of the system.)



$$D = \frac{\text{Return rate of transported fish}}{\text{Return rate of non-transported}} \times \frac{\text{survival rate of non-transported juveniles through hydropower system}}{\text{survival rate of non-transported juveniles through hydropower system}}$$

Perfect world example:

Transport return rate = 3.0%

Non-transport return rate = 1.5%

Juvenile hydropower system

survival = 0.50

$$D = 3/1.5 * 0.5 = 1$$

More likely example:

Transport return rate = 2.1%

Non-transport return rate = 1.6%

Juvenile hydropower system

survival = 0.45

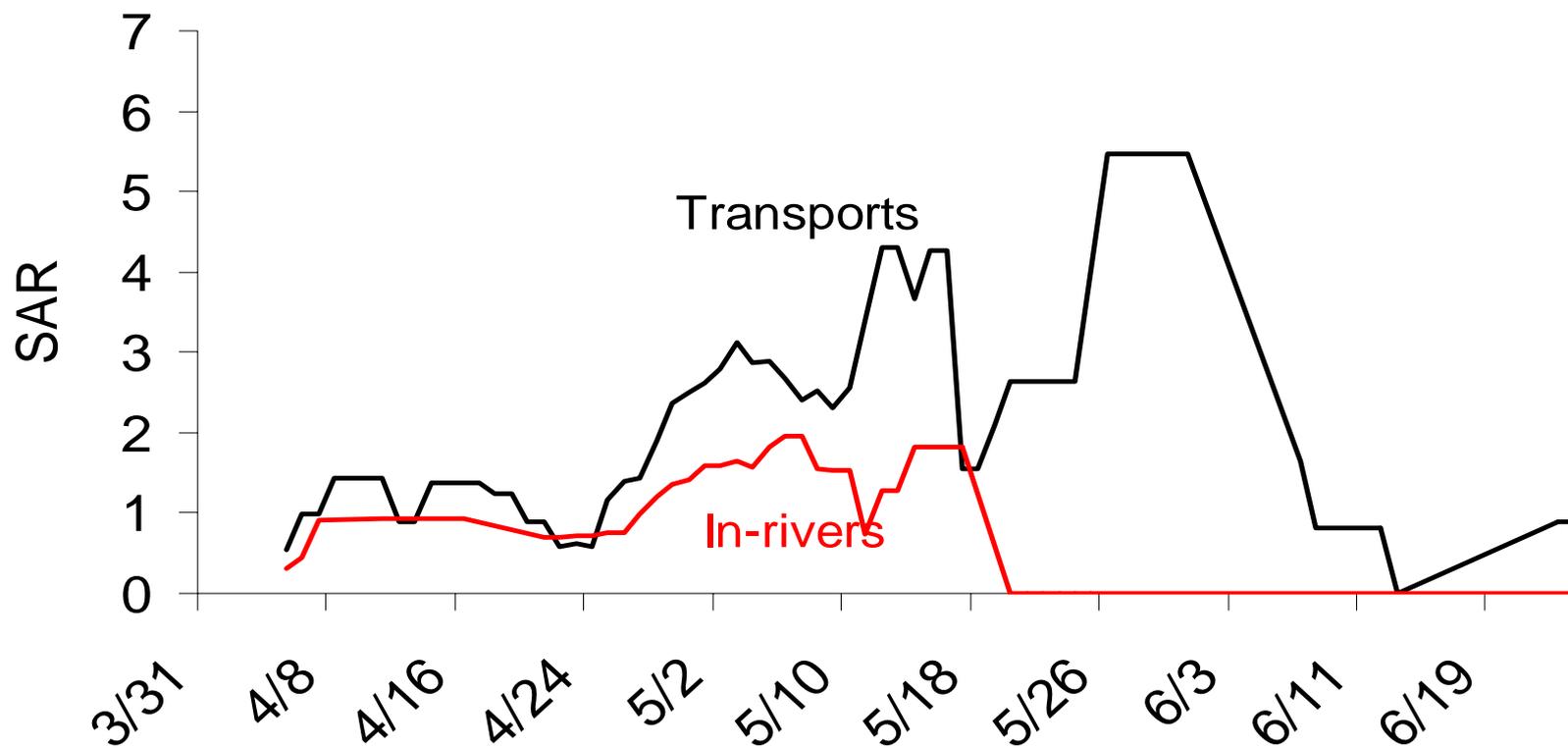
$$D = 2.1/1.6 * 0.45 = 0.59$$



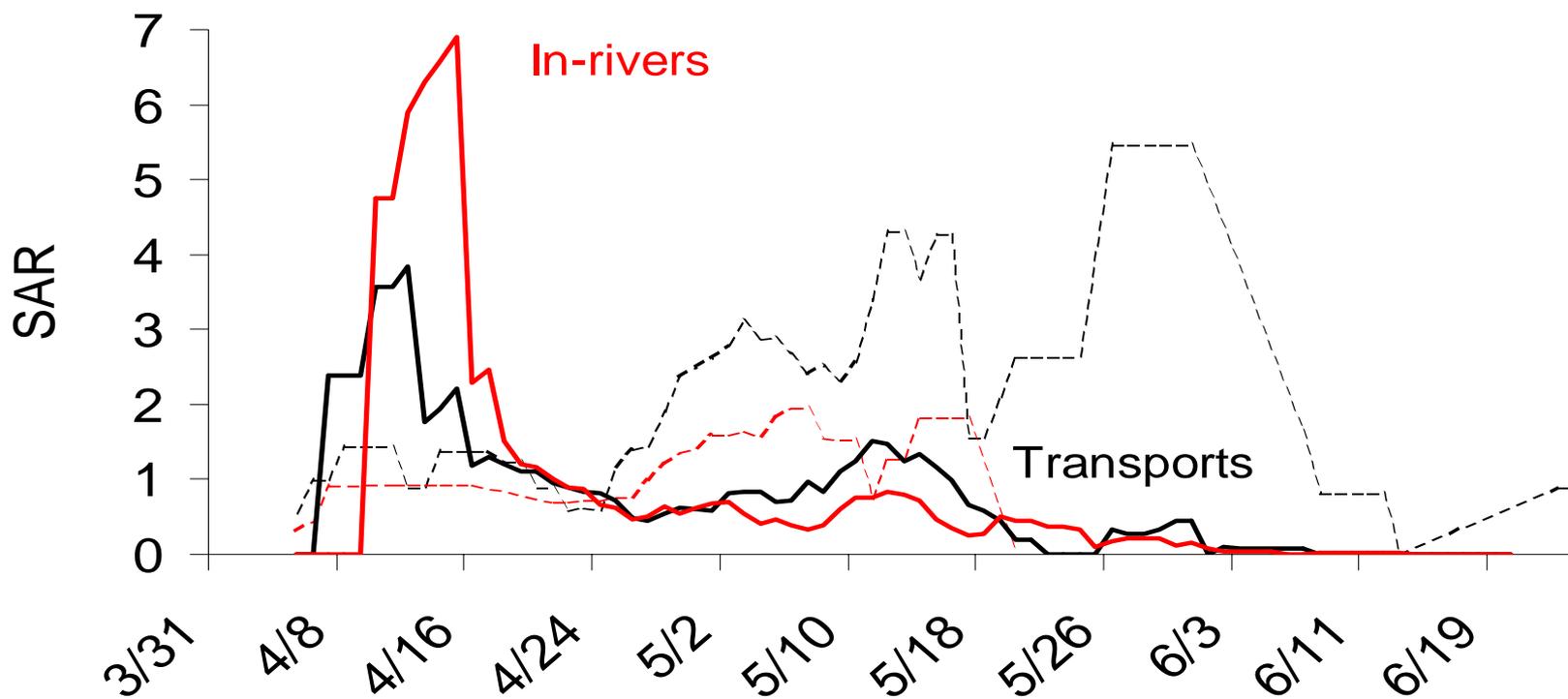
# Chinook Salmon and Steelhead “D” Values

	Geometric mean “D”	(95%) confidence
Tagged above Lower Granite Dam:		
Sp/Su Chinook Salmon		
Hatchery	0.68	(0.52-0.90)
Wild	0.52	(0.36-0.75)
Steelhead		
Hatchery	0.49	(0.31-0.78)
Wild	0.55	(0.29-1.06)
Tagged at Lower Granite Dam:		
Sp/Su Chinook Salmon		
Hatchery	0.66	(0.53-0.82)
Wild	0.66	(0.46-0.93)
Steelhead		
Hatchery	0.69	(0.61-0.78)
Wild	0.90	(0.68-1.18)

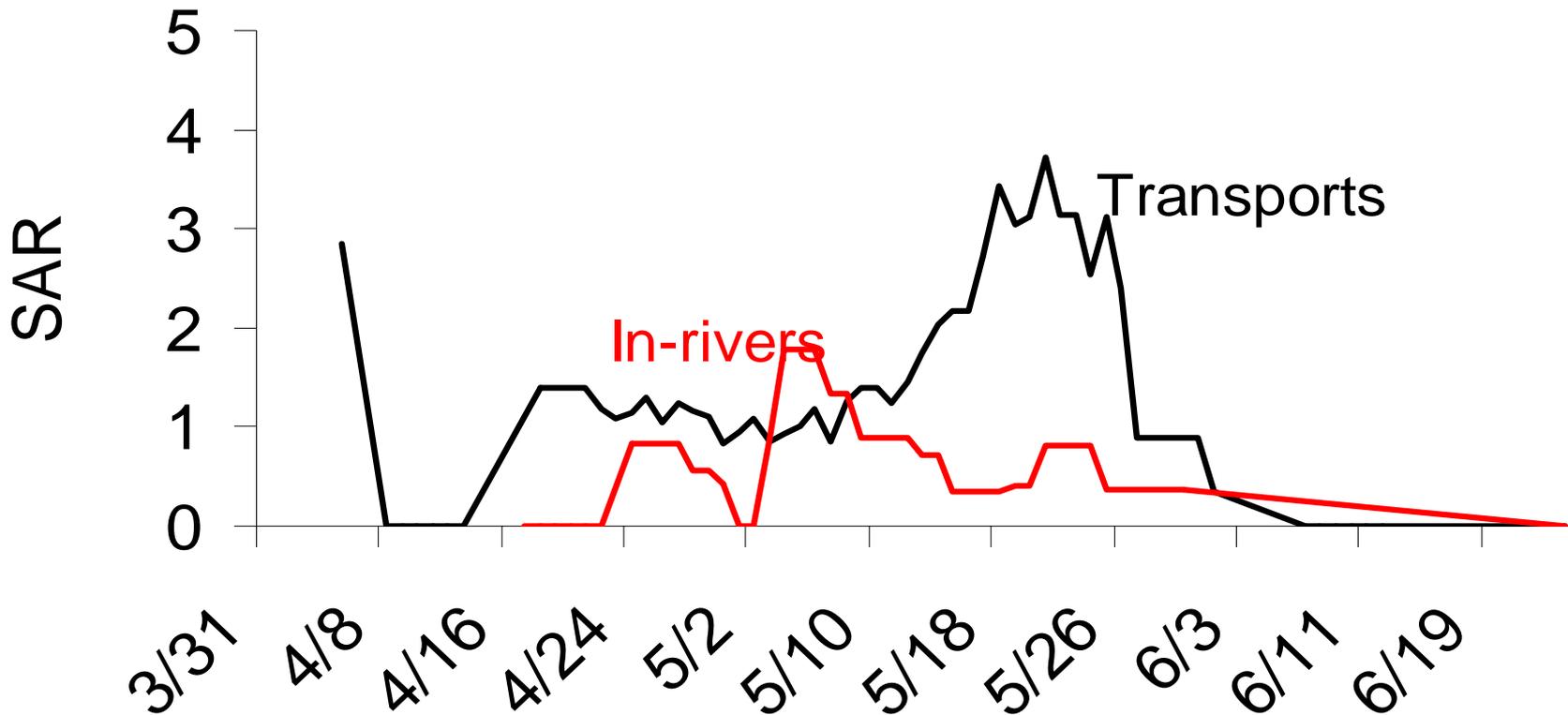
# 1999 Wild Sp/Su Chinook Salmon



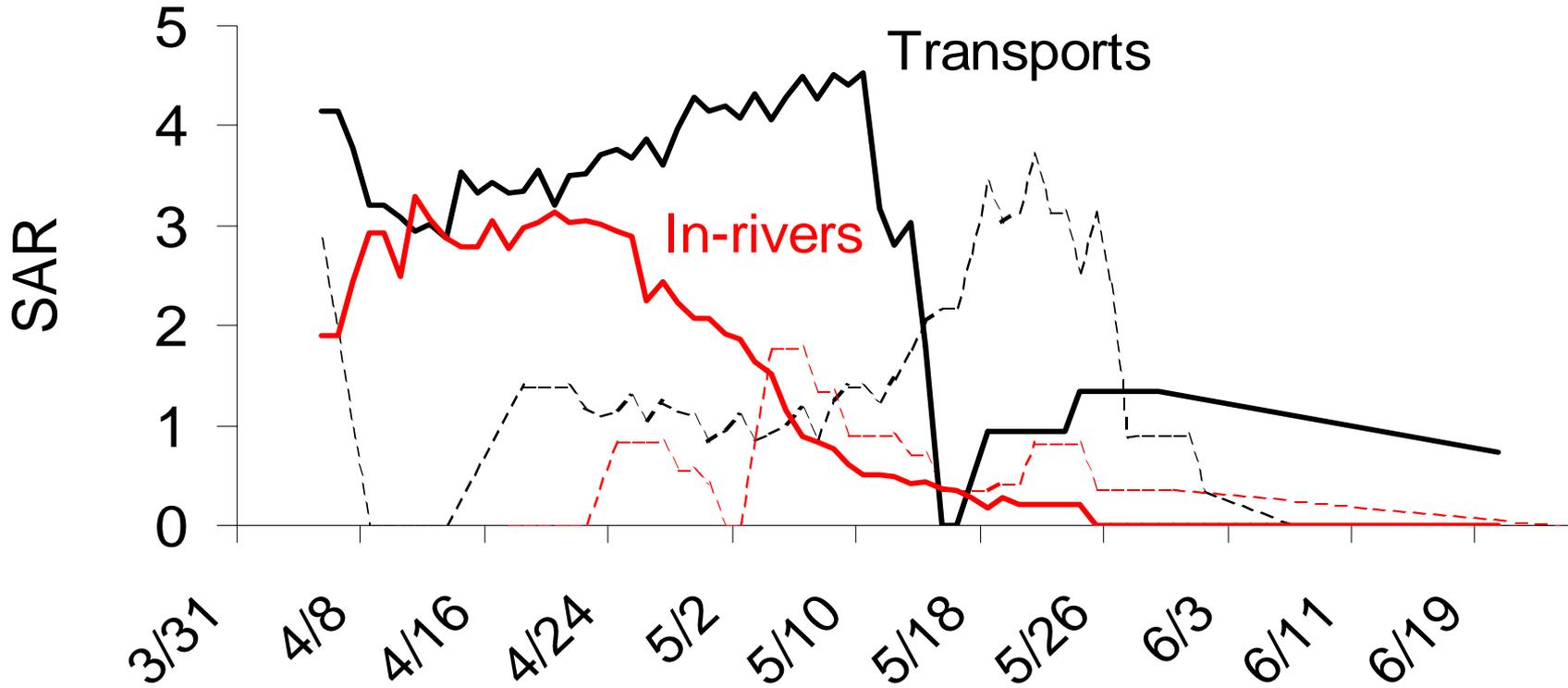
# 2000 Wild Sp/Su Chinook Salmon



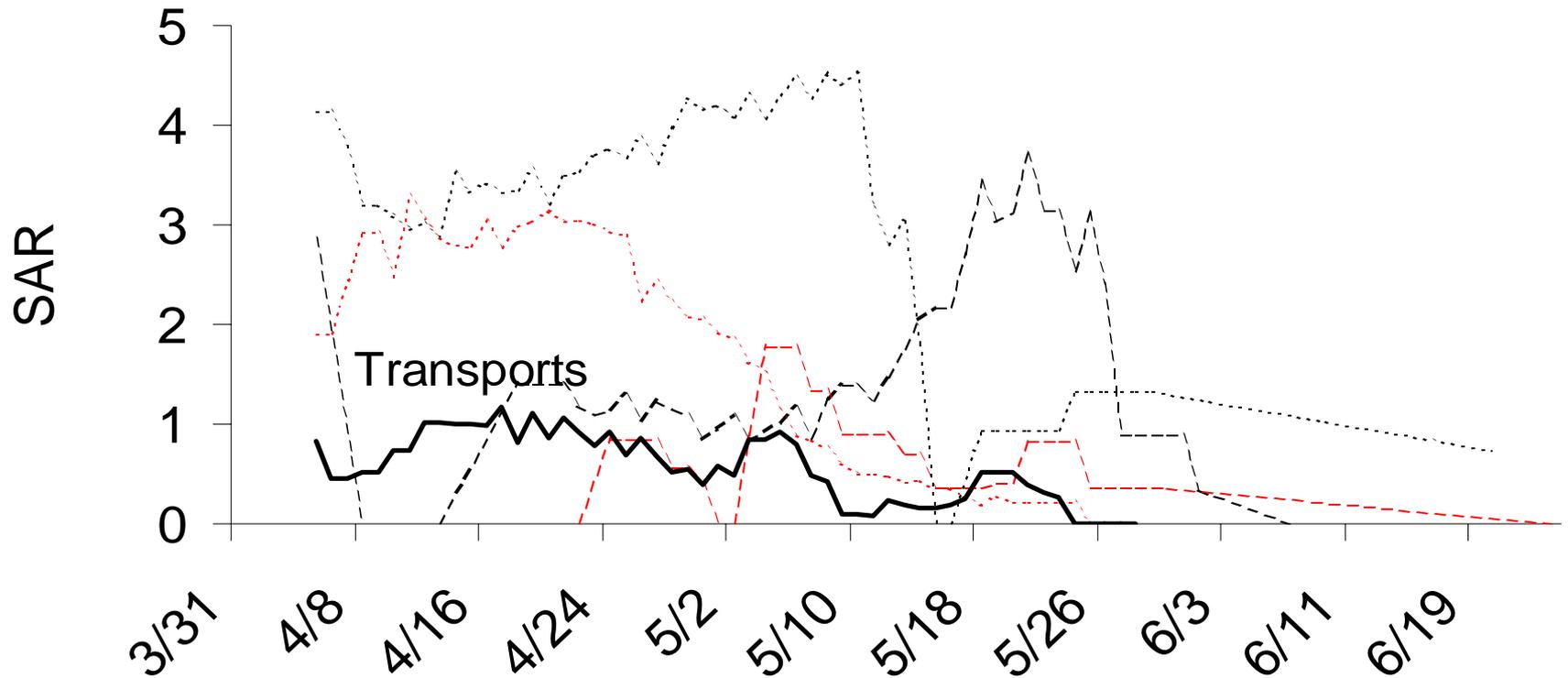
# 1999 Wild Steelhead



# 2000 Wild Steelhead



# 2001 Wild Steelhead



Assumptions:

- \* Streamflows were adjusted to the March Final Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were actual Feb 28th ending elevations
- \* Grand Coulee operates to meet 70 kcfs at Priest Rapids Feb - Apr 30. Coulee attempts to meet McNary flows of 220 kcfs in May to draft limit of El. 1260, and targets El. 1288, 1285, 1280, and 1278 in June, July, Aug 15, and Aug 30. .
- \* Hungry Horse operates to VARQ, meets minimum flows at Columbia Falls, targets full in June, El. 3550 in July, El. 3545 Aug 15, and 3540 ft by 31 Aug.
- \* Brownlee operates to flood control elevations.
- \* Dworshak targets full in June, releases a maximum of 14,000 cfs in July - August for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on minimum flow (4000 cfs) or VARQ flood control March - June. Targets El. 2454 in July with minimum flow of 6000 cfs,

Results:

Priest Rapids Meets Flow Objectives of 70 kcfs Jan - Apr1 and 135 kcfs Apr2 - Jun:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Mar	59	75
Apr1	59	74
Apr2	1	84
May	43	139
Jun	2	102

Lower Granite Meets Flow Objectives of 85 kcfs in Apr - May, 73.3 kcfs in June and 50 kcfs in Jul - Aug:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Apr2	4	59
May	29	84
Jun	30	74
Jul	4	40
Aug1	0	35
Aug2	0	22

McNary Meets Flow Objectives of 220 kcfs in Apr2 - Jun and 200 kcfs in Jul - Aug:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Apr2	0	138
May	28	212
Jun	4	172
Jul	0	138
Aug1	0	128
Aug2	0	105

Bonneville Meets Flow Objectives of 125 kcfs in Feb - Apr:

Month	Occurrences out of 59 Years	Average Flow for 59 Years (kcfs)
Mar	19	123
Apr1	42	137
Apr2	53	157

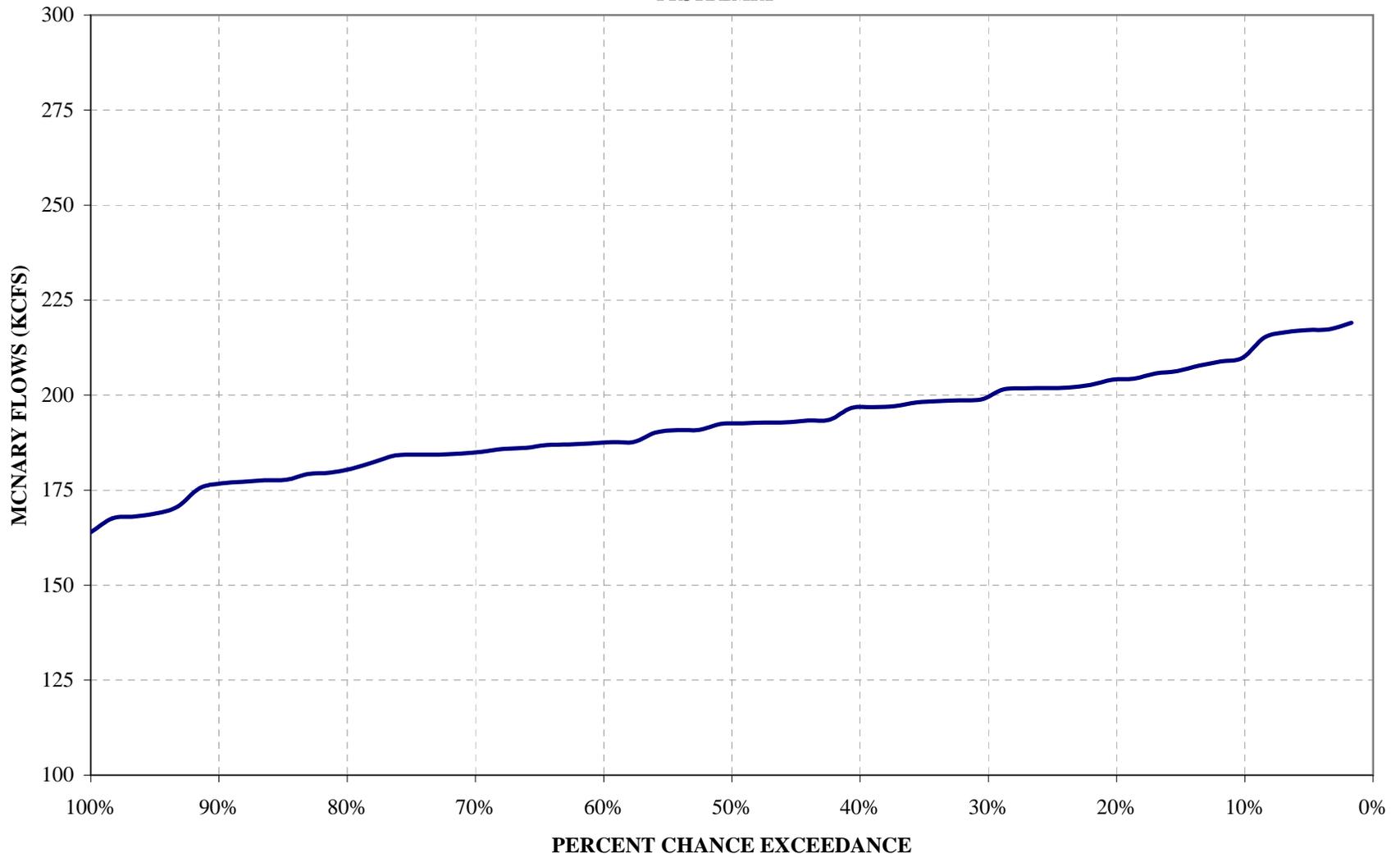
Projects Refill by June

Fill to Flood Control

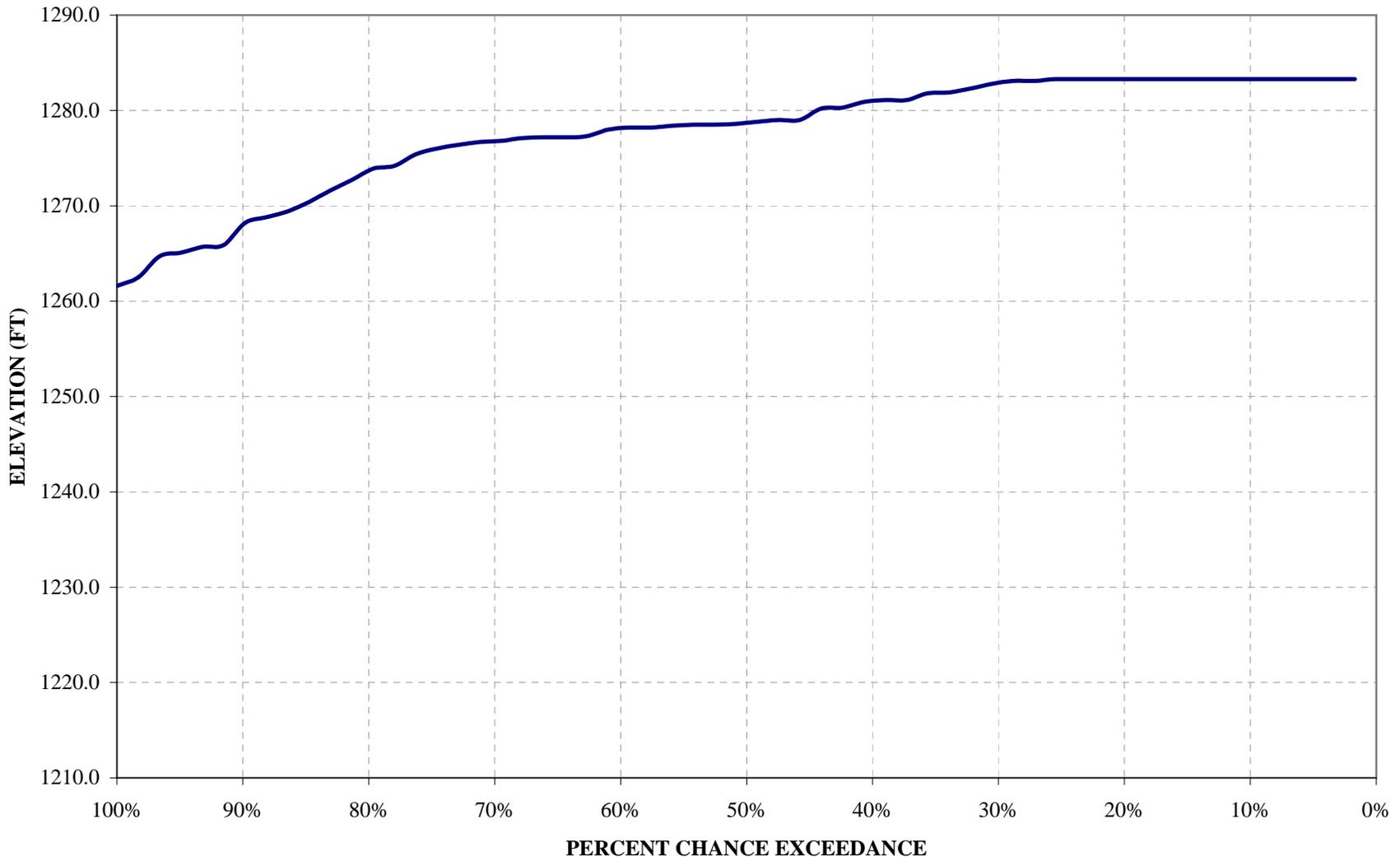
Month	Occurrences out of 59 Years	Average Elevation on 30 Jun for 59 Years	Full	Occurrences out of 59 Years	Average Elevation on 15 April for 59 Years	Flood Control Elevation
Libby	31	2457.0	2459.0	0	2402.8	2452.5
Hungry Horse	2	3555.4	3560.0	0	3507.5	1553.6
Grand Coulee	59	1288.0	1288.0	15	1277.6	1283.3
Dworshak	58	1599.9	1600.0	6	1572.3	1585.5

Note: Grand Coulee operates to meet McNary, 150 kcfs in June, measure refill at El 1288.

**MCNARY OUTFLOW  
MAY-JUNE AVERAGE  
PRJTBLMR1**

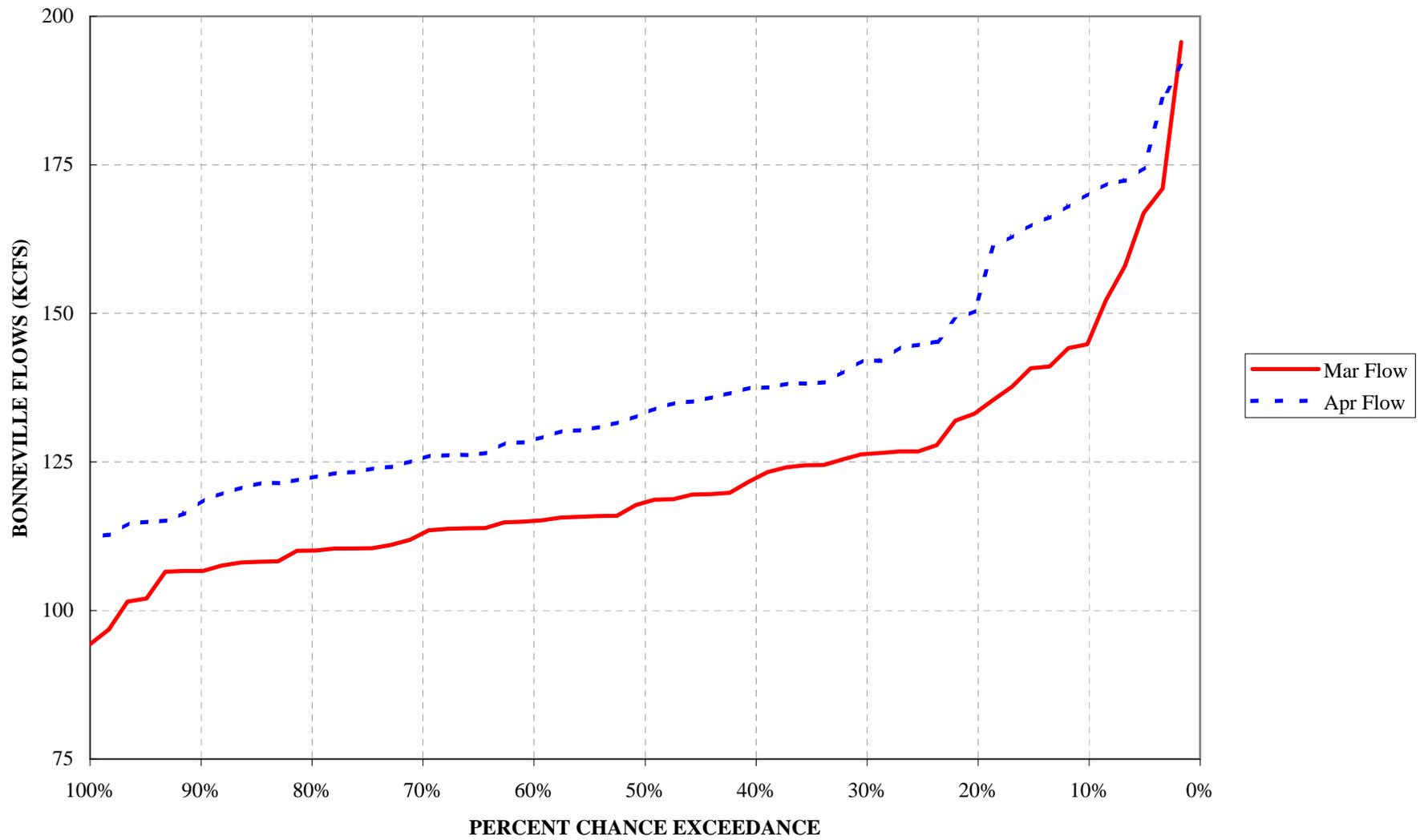


**GRAND COULEE  
APR 15 ELEVATION  
PRJTBLMR1**

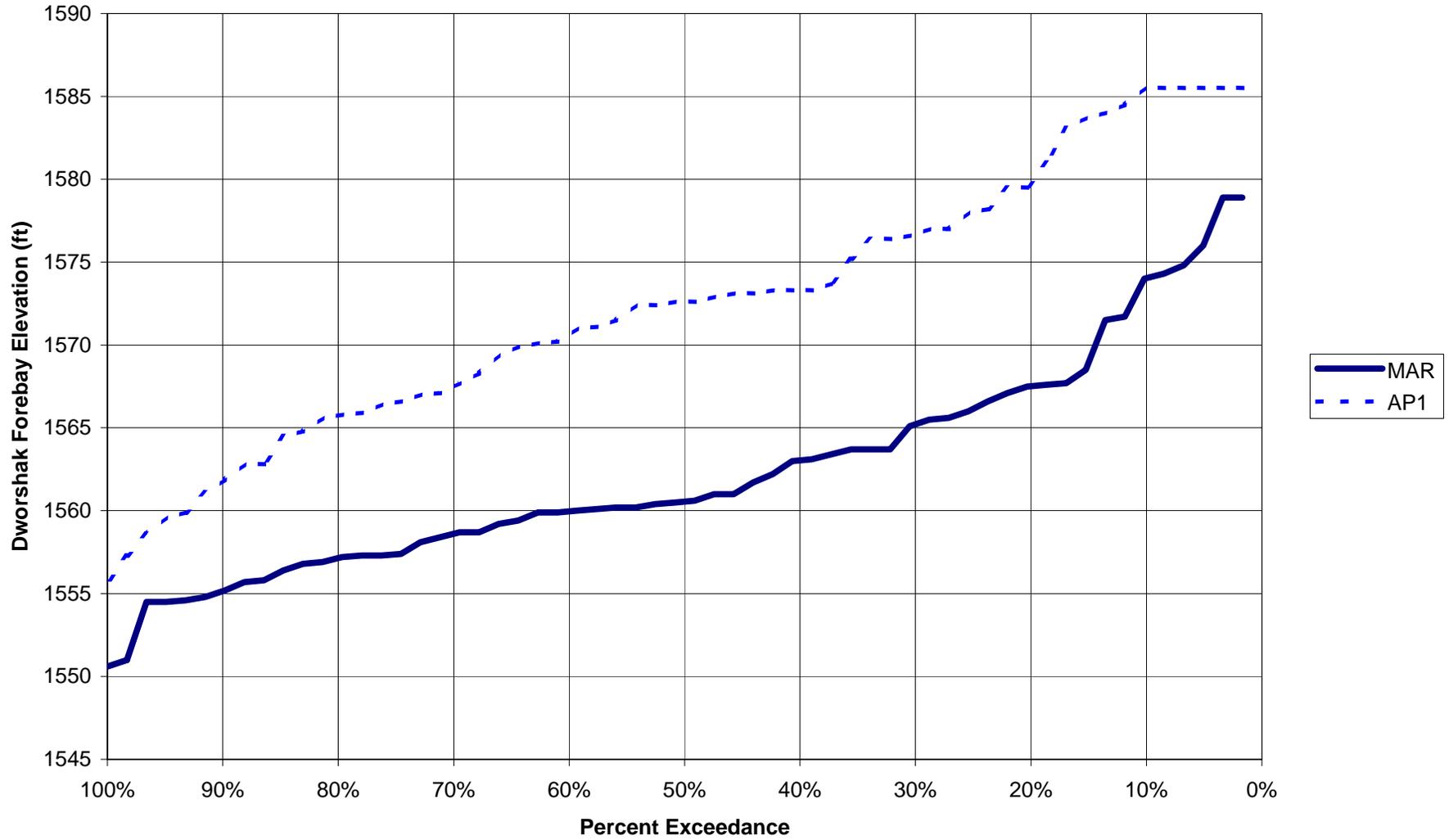


# BONNEVILLE OUTFLOW

PRJTBLMR1



Dworshak Forebay Percent Exceedance  
PRJTBLMR1



Data from file PRJTBMR2  
PRJTBLMR1

**QADJUST MONTH AVERAGE OUTFLOW AND ELEVATION**

	<b>MAR</b>	<b>AP1</b>	<b>APR</b>	<b>MAY</b>	<b>JUN</b>	<b>JUL</b>	<b>AG1</b>	<b>AUG</b>	<b>AVE</b>
<b>Libby Outflow</b>	4,000	4,000	4,000	4,000	5,483	15,523	14,480	18,974	8,289
<b>Libby Elevation</b>	2,402.8	2,402.8	2,405.8	2,429.9	2,457.0	2,454.0	2,449.0	2,439.1	2,432.0
<b>Grand Coulee Outflow</b>	70,248	68,159	74,552	120,395	83,298	90,242	87,594	78,950	86,469
<b>Grand Coulee Elevation</b>	1,281.4	1,277.6	1,278.6	1,268.0	1,288.0	1,285.0	1,280.0	1,278.0	1,279.9
<b>Dworshak Outflow</b>	1,574	1,797	4,261	9,642	5,691	13,849	13,987	5,767	7,278
<b>Dworshak Elevation</b>	1,562.3	1,572.3	1,582.4	1,592.0	1,599.9	1,558.4	1,531.5	1,520.2	1,569.3
<b>Hungry Horse Outflow</b>	2,200	690	690	690	690	4,486	4,663	4,200	2,198
<b>Hungry Horse Elevation</b>	3,505.4	3,507.5	3,513.1	3,536.6	3,555.4	3,550.0	3,545.0	3,540.0	3,533.4
<b>Lower Granite Outflow</b>	31,483	47,100	59,461	84,085	74,369	39,829	35,304	21,862	51,939
<b>Priest Rapids Outflow</b>	74,516	73,962	83,805	139,302	107,736	102,163	94,363	84,028	98,633
<b>McNary Outflow</b>	109,363	124,846	138,197	212,203	171,938	138,123	128,395	104,906	146,634
<b>Bonneville Outflow</b>	122,520	137,490	157,243	221,545	182,088	144,952	134,127	109,753	156,736

**Note: Outflows are regulated outflows in cubic feet per second  
Elevations are Forebay elevations in feet.**



# Columbia River Inter-Tribal Fish Commission



## RIVER | OPERATIONS | PLAN | 2003



PUTTING FISH BACK IN THE RIVERS

**Columbia River Inter-Tribal Fish Commission  
2003 River Operations Plan**

**March 18, 2003**

**Overview**

The Columbia River Inter-Tribal Fish Commission (CRITFC) presents the 2003 River Operations Plan (Plan) for the Federal Columbia River Power System (FCRPS), the Hells Canyon Complex and mid-Columbia FERC-licensed hydro-projects including Rock Island, Rocky Reach, Wanapum and Priest Rapids. The Plan contains recommendations for water management and dam operations, including flows, reservoir elevations, spill, and fish facility operations. It also contains recommendations for water acquisition. Each of the recommended actions will contribute singularly and cumulatively to increase mainstem salmon protection and survival. Current direct mortality and indirect mortality for Snake River yearling chinook is estimated between 25% - 73% and 37% - 68% respectively (Budy et al. 2002). If implemented, the recommended actions in this Plan will likely reduce these significant mortality rates.

In 2003, the Columbia Basin has experienced low precipitation levels and unusually warm weather and correspondingly low snowpack levels. The basin faces the second serious drought situation in three years. Near historical levels of adult salmon escapement in 2002 indicate that many juvenile salmon will be outmigrating this spring and summer. For example, an estimated 40 million juvenile bright fall chinook will emerge from the Hanford Reach this spring (Hoffarth 2003 pers. comm.), which is about 40% above average production. With respect to Okanogan Sockeye, the last transboundary stock, a large adult escapement in 2001 is projected to produce some 2.2 million smolts that will migrate seaward this spring; this compares to about 200,000 smolts that will migrate in seaward in 2004 due to low 2002 adult escapements (Hyatt 2003 pers. comm.) Thus, it is critical that substantial anadromous fish productivity in 2003 be protected through the hydro-system through appropriate river operations.

The USDA-Natural Resources Conservation Service and the National Weather Service project a 75 million acre feet (MaF) January-July runoff for the Columbia at The Dalles or 70% of normal for 2003. CRITFC staff, through independent analyses, project about a 68 MaF runoff forecast. <sup>1</sup> This forecast compares to a 107 MaF runoff average runoff over the historical period of record and a 58.5 MaF runoff in 2001.

In 2001, low runoff and financial and power emergencies declared by BPA eliminated fish flow augmentation and reduced fish spills to a fraction of those required under the NMFS

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<sup>1</sup> CRITFC analysis of trends of historical water supply forecasts produced a series of correction curves (Martin 2002) and indicates that the final forecast for the Columbia at The Dalles for the year is likely to be near 68.3 MaF.

(NOAA Fisheries) 2000 Biological Opinion for the Federal Columbia Power System (FCRPS). Salmon and steelhead losses were significant. For example, the Fish Passage Center noted that only 4% of Snake River juvenile steelhead survived passage from Lower Granite to Bonneville Dam, and some 27% of Snake River juvenile chinook survived to Bonneville. Juvenile run timing was affected with the runs beginning later and with shorter passage durations. Travel times in 2001 were some of the slowest observed in the historic records. Many migrants did not arrive to downstream dams. Power peaking in the Hanford Reach exacerbated the effects of the low flow year.

Unfortunately, BPA is currently immersed in a serious financial crisis that could, as in 2001, cause a declaration of a power or financial emergency that could again significantly reduce fish flows and spill. Unusually warm winter temperatures may reduce a normative peaking mainstem flow for fish migrations due to the unavailability of snowpack at lower elevations. While the federal operators appear to be more conservative regarding liberal flood control management, preemptive drafting of upper basin storage has already occurred.

The foundation of the CRITFC 2003 River Operations Plan (Plan) is a peaking normative, hydrograph which offers juvenile salmon migrations a more natural flow regime to 1) reduce time of entry into saltwater, 2) create an enhanced mainstem and Columbia River near-ocean plume to enhance critical habitat, and 3) minimize predation losses (Williams et al.1996; Bunn and Arthington 2002). Plan operations use limited available storage and flood control rule curve modifications to create a peaking hydrograph in late May to accommodate an earlier than normal juvenile salmon emigration due to warmer than normal mainstem water temperatures.

Plan operations were modeled against probable federal river operations. The Northwest Power Planning Council's GENESYS Hydro-regulation model (Version 2.6.1) was used for these analyses. The model simulates recommended monthly flow and reservoir elevations at various index points in the Basin. The Plan uses altered flood control rule curves (Martin 2003) and additional "pockets of water" from upper basin storage to create a natural flow regime for virtually all major river index points. Using the GENESYS model with the historical water years 1929-1978, the system-wide flood risk for the CRITFC plan is about the same as federal operations.

The CRITFC Plan operations assure beneficial flows for anadromous fish, while seeking to maintain higher reservoir levels for resident fish and tribal cultural resource protection. The spill season in the Plan is extended and enhanced over that required in the NMFS 2000 Biological Opinion for the FCRPS in the spring and summer to many federal dams. The Plan's spring and summer spill recommendations extend spill timing and amounts for Rocky Reach and Rock Island dams, but maintain Priest Rapids and Wanapum spill levels as provided under the 2000 Memorandum of Agreement. The Plan also contains specific recommendations and guidelines for power peaking, adult and kelt passage, water temperature criteria to meet Clean Water Act standards, water management during the tribal treaty fisheries, fish facility operations and mainstem research. Also offered in the Plan is a list of key fish facility mitigation projects, which, if implemented, could result in significant improvements in fish passage survival. The Plan also offers a water management paradigm that avoids the weaknesses of week-to-week

trade offs common to the Technical Management Team, Implementation Team, and Regional Executive Committee forums.

The difference in CRITFC's altered flood control operation and the Corps' standard flood control operation varies from 6.6 MaF (as modeled in GENESYS, Table 2) to 2.2 MaF (as compared with the Corp's in-season calculations), spread amongst Arrow, Libby, Hungry Horse, Grand Coulee, Brownlee, and Dworshak dams. Because of a pre-emptive flood control draft at Libby in December, the reservoir is struggling to meet the Corps' Upper Rule Curve. The CRITFC plan would have left 13 more feet in Libby and carried throughout the water year. The water saved from altered flood control operations should be applied to spring salmon migrants. Further, the shut down of the WNP-2 nuclear plant in early March resulted in the operators using storage in Dworshak and Lake Roosevelt to meet power needs. The loss of this storage may impact spring flows and the ability to meet the April 10 refill requirement called for by the NMFS 2000 Biological Opinion for the FCRPS.

Given another drought situation in 2003 with extraordinary numbers of juvenile salmon migrating seaward through the hydrosystem, it is critical that measures in the 2003 CRITFC River Operations Plan be fully implemented. CRITFC urges the federal Government, Idaho Power Company, and the Mid-Columbia Public Utility Districts to seriously consider implementing the recommendations in this Plan.

## Key Plan Recommendations

### *Decision Making*

- The Technical Management Team (TMT) and Implementation Teams are useful for some regional information sharing but they do not suffice for river operations decision-making and are not government-to-government forums. The CRITFC tribes formally withdrew from TMT and other NMFS forums in 1997, due to the lack of formal government-to-government consultation mandated in various federal agency policies and the 1997 Secretarial Order to the Departments of Interior and Commerce. Further, the TMT is prevented from candid discussions of operational alternatives due to the presence of various power marketing entities.<sup>2</sup> To avoid these serious problems, the federal operators and NMFS should use CBFWA as a technical forum to discuss river operations where all 13 Columbia Basin tribes can have meaningful input. Disputed issues should be raised to an executive committee table. Similarly, spill and flow decisions in the Mid-Columbia should be determined in the Mid-Columbia Coordinating Committees established by individual settlement agreements for Wells and Rock Island Projects and under the Mid-Columbia Proceedings established under existing licenses for Rocky Reach, and Priest-Wanapum Projects.

### *Emergency Declarations*

- The definition of “emergency” and related procedures must be recast for 2003 to exclude any BPA financial problems. The definition of “emergency” must be based on unforeseen circumstances. Any power sales revenues accruing to BPA and attributable to an emergency operation must be set aside for salmon mitigation, where such amounts will be in addition to and not in lieu of previously planned BPA expenditure levels.

### *Energy and Water Conservation*

- Water and land acquisition programs begun in 2001 should be continued.
- BPA should renew the 1995-2001 contract with Idaho Power Company to allow flexibility in flow augmentation through power exchanges.

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<sup>2</sup> TMT meetings are typically attended by several power-marketing representatives from private companies or corporations. These representatives are present to learn of real-time federal operators river operation plans, in order to maximize power-marketing arrangements. As a result, federal operators are hesitant to disclose vital information and making decisions for fishery management to the tribes, state and federal fishery managers in this forum. TMT was not burdened with this situation in the early years of its implementation, but now it is a serious obstacle to regional information sharing, and has greatly diminished and compromised any effectiveness of TMT.

*Runoff Forecast*

- The Plan assumes that 64 % of normal precipitation pattern will continue into spring, while the Northwest River Forecast Center continues to predict “near normal” precipitation.<sup>3</sup> Based upon the historical flow record that shows a declining runoff pattern in below average years, CRITFC anticipates that a continuing pattern of below normal precipitation is likely. A comparison using the University of Washington’s Climate Impact Group’s (CIG) Experimental One-Year forecast (Hamlet and Lettenmaier 2002), using their VIC Hydro Model, points to a similar conclusion, if their forecast flows are adjusted downward to closely match the unregulated October-December flows for the Columbia at The Dalles (Table 1).
- Water supply forecast correction curves suggest a low water year. Runoff in the CRITFC 2003 River Operations Plan is projected to be 68 MaF for the Columbia at The Dalles.

Table 1. UW-Climate Impact Group forecast for the Columbia at The Dalles for WY 2003.

Initial Cond. WY1962	The Dalles		59% UW Unregulated Flow
	UW-CIG (unregulated) (KaF)	(KaF)	
Oct	6550	3304	3865
Nov	6705	3372	3956
Dec	5949	3536	3510
Jan	5174		3053
Feb	4817		2842
Mar	6693		3949
Apr	12033		7099
May	24517		14465
Jun	31731		18721
Jul	20566		12134
TOTAL: (MaF) (Jan. - July)	<b>109.5</b>		<b>62</b>
Regression:	<b>109.5</b>		<b>65</b>

<sup>3</sup> The Northwest River Forecast Center continues to predict close to 100% of average future precipitation, but CRITFC estimates that these projections are very liberal. Flows at all basin index points in the Plan (Attachment 1) were based on runoff at about 64% of normal precipitation and snow-pack.

## *Flow and Reservoir Management*

- Available storage and runoff should be shaped to meet natural peaking, normative hydrographs at Priest Rapids, Lower Granite, The Dalles and other index points (Attachment 1). Detailed weekly operations, using the NWRFC's NWSRFS-STP model, are offered in Attachment 2. The object is to provide flushing flows during the main portions of the juvenile and adult migrations and to leave as much storage as possible for resident fish and tribal cultural resource protection. Given the impact of *El Nino* on the regional snow-packs, it is very likely that the freshet will peak in mid May this year.
- As recommended in the NMFS 1995-1998 Biological Opinion for the FCRPS, in water years when the January-July forecast is less than 95 MaF at The Dalles, 500 KaF of flood control should be shifted from Arrow to Mica (Attachments 1 and 2).
- In general, reservoirs are left at the end of the salmon migration season at or above elevations specified by the NMFS 2000 FCRPS Biological Opinion.
- Dworshak. Refill of Dworshak Reservoir by the end of June is a high priority (Attachments 1 and 2). The majority of flow should be dedicated to summer migrants and temperature control to attempt to meet Clean Water Act standards in the Lower Snake River. Consistent with the Nez Perce Tribe-State of Idaho Plan, Dworshak should fill to msl 1600 by June 30 for juvenile and adult summer migrants and temperature control. A draft to msl 1590 feet in late July may be needed to alleviate temperature problems in the lower Snake. Dworshak should draft to msl 1520 feet by September 30.
- Lower Granite Reservoir should be drawn down to msl 723 feet during June 20 - October 31 to decrease juvenile and adult travel time and to make increase the effectiveness of temperature control from Dworshak.
- Hells Canyon Complex. The 110 KaF described in the 1998 FERC Biological Assessment for the Hells Canyon Complex should augment Snake River spring flows in May. For summer flows in June and July, Brownlee should contribute an additional 237 KaF described in the 1998 Biological Assessment and should pass through all upper Snake storage in June-August in addition to the 237 KaF from Brownlee. Idaho Power Company is requested to follow plan recommendations and should continue negotiations with BPA concerning establishment of a power and water exchange contract (Attachment 4). NMFS should release a biological opinion for the Hells Canyon Complex that includes Plan recommendations, with or without power/water exchange contract.
- Upper Snake storage. An additional 450 KaF should be added to the 427 KaF required in the NMFS 2000 FCRPS Biological Opinion for a total of 877 KaF flow augmentation from the upper Snake from Bureau of Reclamation and Corps of Engineers upper Snake reservoirs. This water should be passed through the Hells Canyon Complex in a timely manner to augment June, July, and August flows.

- Lake Roosevelt. Reservoir flood control drafts should be restricted to msl 1270 or 1275 feet by early June, which allows runoff refill for spring flows, Hanford Reach juvenile out-migration protection and summer flows (Attachments 1 and 2). Lake Roosevelt is drafted to msl 1280 feet by late July, held through August, and fills to msl 1283 feet by late September for resident fish and cultural resources.
- Banks Lake. Storage of 260 KaF (10 foot draft at Banks Lake) should remain in Lake Roosevelt instead of being pumped into Banks Lake to provide additional flow augmentation for salmon in August and September.
- Canadian storage. Storage should be released in early spring in order to leave some storage in Lake Roosevelt for salmon migrants and energy needs (Attachments 1 and 2). Consistent with the NMFS 1995-1998 FCRPS Biological Opinion for a 68 MaF runoff year, 500 KaF of flood control should be reallocated from Arrow to Mica. An extra 500 KaF from Canadian Non-Treaty storage over the 1 MaF called for by the NMFS Biological Opinions should be allocated for downstream flows.
- The CRITFC 2003 Plan recommends that modified VAR-Q operations be implemented at Libby and Hungry Horse without compensating drafts of Lake Roosevelt (Attachments 1 and 2). This action would hold storage in upper basin reservoirs for anadromous fish migrations and reduce impacts to resident fish. These operations are consistent with historical runoff volumes for below-normal water years.
- Libby. Storage should be managed for sturgeon flows (a three-week operation is offered), downstream salmon migrations and resident fish needs by implementing modified VAR-Q operations (Attachment 1) and fills within one-foot of full by late July (Attachment 2). Libby should be drafted to avoid drafting Dworshak, which has substantial temperature control capacity in the lower Snake.
- Hungry Horse. Storage should be managed for salmon flows and resident fish needs by implementing modified VAR-Q operations. CRITFC operations leave the reservoir 2 feet higher across WY 2003 (Attachment 1) and fills by June 30<sup>th</sup> (Attachment 2). Minimum flows of 2.5 kcfs maintained through September would benefit Columbia Falls flows.
- Power peaking/load following. Should be restricted to: 1) avoid stranding of juvenile salmon in the Hanford Reach, 2) allow fish ladders and other fish passage facilities to operate within established criteria and protocols and 3) and to allow proper conduct of tribal treaty fisheries.
- Meeting Clean Water Act standards for dissolved gas and temperature is a high priority. Juvenile salmon should be left in river to take advantage of cool water releases and to avoid high temperatures in screen and transportation systems.

### *Hanford Reach Flows*

- Power peaking should be restricted to avoid stranding of Hanford Reach juvenile chinook, especially during the key fry susceptibility period (March 15 - June 10). Fluctuations during this period should not exceed specified criterion during each 24-hour period in the CRITFC 2003 Hanford Stranding Operations Recommendations. (Attachment 3). Grant PUD should fund and should cooperate with tribal and fishery agency 2003 Reach monitoring and evaluation efforts.

### *Spill*

- Spill has been demonstrated to be the most effective and safest means of juvenile project passage (Fishery Managers 1994; NPPC 1999). Spill also best protects the beneficial use under the Clean Water Act by providing salmon access to lower temperatures found at depth in the reservoirs instead of higher temperatures found in dam bypass and transportation systems. Spill also provides safer downstream passage for steelhead kelts and adults that fallback over dams than powerhouse routes. Starting dates are March 20 and go until June 20 (Snake) or June 30 (Columbia). End dates include August 31 (Snake) and September 15 (Columbia).
- CRITFC recommends provision for summer spill at Lower Granite, Little Goose, Lower Monumental and McNary dams above the requirements of the NMFS 2000 FCRPS Biological Opinion.
- CRITFC recommends provision for daytime spill at John Day, McNary and the Lower Snake River dams. When implemented, daytime spill at most dams has been demonstrated to be as successful or more so than nighttime spill.
- The Corps of Engineers should complete their timely application for a total dissolved gas waiver to the appropriate water quality agencies to allow for both spring spill at the eight federal dams and summer spill at all dams.

### *Dam Facility Operations and Research*

- Fish facilities should be operated according to CRITFC and other salmon managers' recommendations for the Corps of Engineers' 2003 Fish Passage Plan (Attachment 5). Inspection of facilities should be increased to three inspections per day. Salmon Corps participation in monitoring dam passage facilities should be established by CRITFC and Corps of Engineers collaborative efforts.
- Fish facilities should have full components of spare parts and backup systems, consistent with CRITFC and other fishery agencies recommendations to the Corps' 2003 Fish Passage Plan.
- Monitoring systems for water quality should be installed by the federal operators throughout the dams and reservoirs with real-time tracking of data.
- Mainstem research that involves fish handling and tagging and modifications to fish protection measures should be extremely limited, should not compromise fishery operations and should meet consensus tribal and fishery agency approval.

### *Fish Facility Mitigation Projects*

- A list of mitigation projects has been compiled for dam fish passage facilities (Attachment 6). Funding of these projects would individually and collectively increase juvenile and adult passage success and survival.

## 2003 FCRPS Flow Operations

The 2003 River Operations Plan recommends that the federal operators reshape available runoff and reservoir storage to create a natural peaking (i.e., normative) flow regime. The Plan specifically dedicates available runoff and storage to shaping the limited amount of water to best meet the migration and habitat requirements for anadromous fish. Low runoff in 2003 will cause the Plan's peaking hydrograph to be less than under a normal water year; target flows under the NMFS 2000 Biological Opinion seasonal flow targets will not be met.

That salmon flow is positively related to increases in survival and productivity has been established in various forums worldwide including a 1994 independent scientific review under the NPPC, biological opinions and recent analyses by the fishery agencies and tribes (Agencies and Tribes 2003). In their 1995-1998 FCRPS Biological Opinion, NMFS provided minimum flow recommendations for listed salmon and established seasonal, flat, "target flow" regimes, which were considered the minimum flows necessary to prevent jeopardy to listed salmon populations. The NMFS 2000 FCRPS Biological Opinion continues the concept of "target flows" for salmon, where specific seasonal average flows are to be met at Lower Granite, Priest Rapids and McNary Dam. During the creation of the target flow concept, it was realized by NMFS and the federal operators that the seasonal targets would not be met during the lowest series of water years, such as the case in 2003. Similarly, in 2001, none of these targets were met, and in many higher runoff years since the 1995-1998 Biological Opinion, these targets often have been missed.

The 2000 Biological Opinion differs from the 1995-1998 Biological Opinion in that the federal operators have more discretion to avoid implementing measures that will insure that flow targets are met. For example, the 1995-1998 Biological Opinion required the Corps to shift flood control storage further down the system and modify flood control rule curves to allow reservoirs to store more of the spring runoff for fish summer flows. In the 1995-1998 Biological Opinion, the Bureau of Reclamation was to provide an additional 1 million acre-feet (MaF) of water from the upper Snake for salmon flows. Again, this operation has yet to be realized.

The Plan's hydrograph has monthly flow objectives that would have peak flows well below flood stages in Portland and other basin locations <sup>4</sup> (Figures 1, 2, and 3). Alternative flood control curves were modeled within GENESYS (Martin 2003) and those results feed into the attached spreadsheet. The URC values are listed in Table 2. Water Years 1929-31, 1937, 1941, 1944, and 1973 were chosen in the modeling because their volumes average out to CRITFC's projected 68 MaF forecast for WY 2003. The flow values shown in Figures 1, 2, and 3 use the inflows from the NWRFC's new NWSRFS-STP hydro model (daily and weekly time steps) and

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<sup>4</sup> Flood stage is defined by the Corps as 550 kcfs measured at The Dalles Dam. Bank-full stage is defined by the Corps as 450 kcfs measured at The Dalles. The peak flow in CRITFC's 2003 River Operations Plan with altered flood control rule curves is about 360 kcfs at The Dalles, or 90 kcfs below bank-full. In the 2002 Biological Assessment for the Lower Columbia Channel Deepening, the Corps states that flood control was managed to keep peak flows at The Dalles at 550 kcfs in 1970 and prior years. In recent years, the Corps has managed to keep peak flows at The Dalles at about 360 kcfs, without Congressional authorization.

the elevations modeled in GENESYS (monthly time steps) guided the shaping of the seasonal flows.

In the Plan, the receding limb of the hydrograph that provides summer fish flows would be augmented by adding drafts of upper basin storage beyond what is required in the NMFS 2000 Biological Opinion. Drafts include an additional 500 KaF from Non-Treaty Storage, an additional 450 KaF of upper Snake storage, and 237 KaF of Hells Canyon Complex storage. The resultant summer flows would create better migration conditions by reducing salmon travel time and mainstem temperatures.

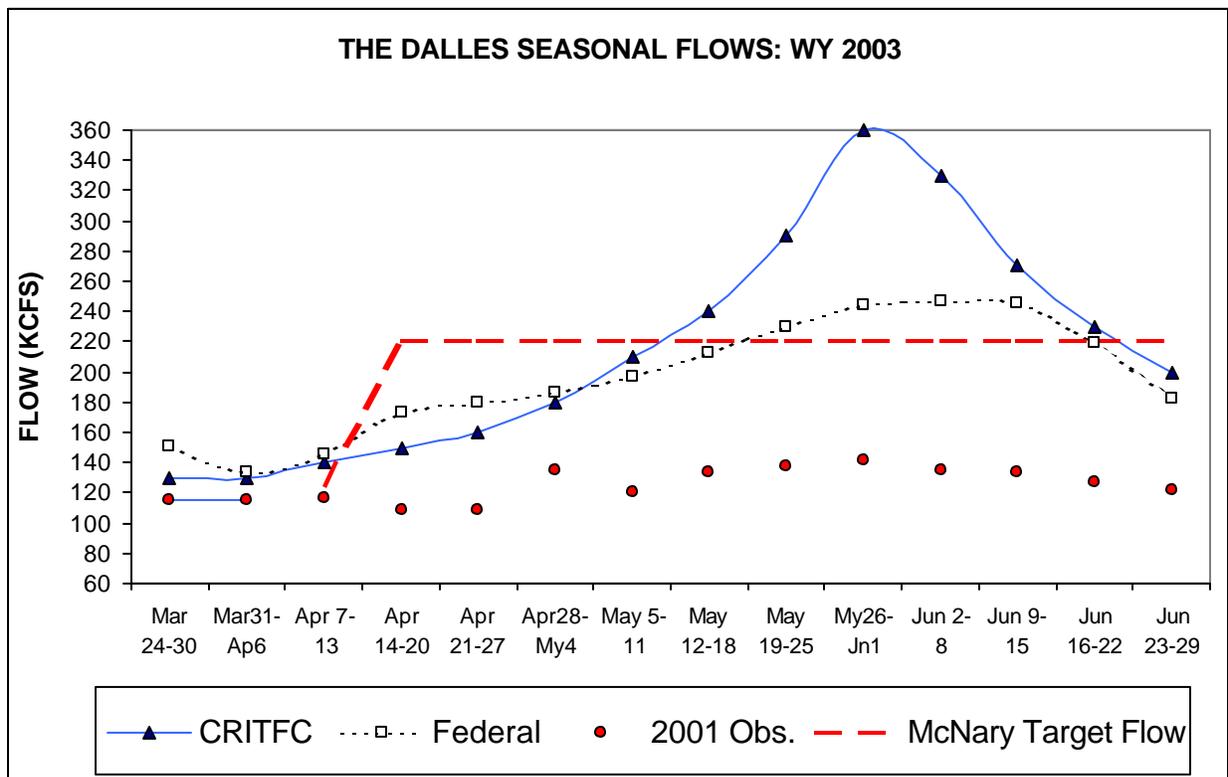


Figure 1. 2003 CRITFC River Operations Plan hydrograph for the Columbia at The Dalles during spring compared to 2000 Biological Opinion flow targets, 2001 observed river flows, and likely 2003 river flows under federal operations.

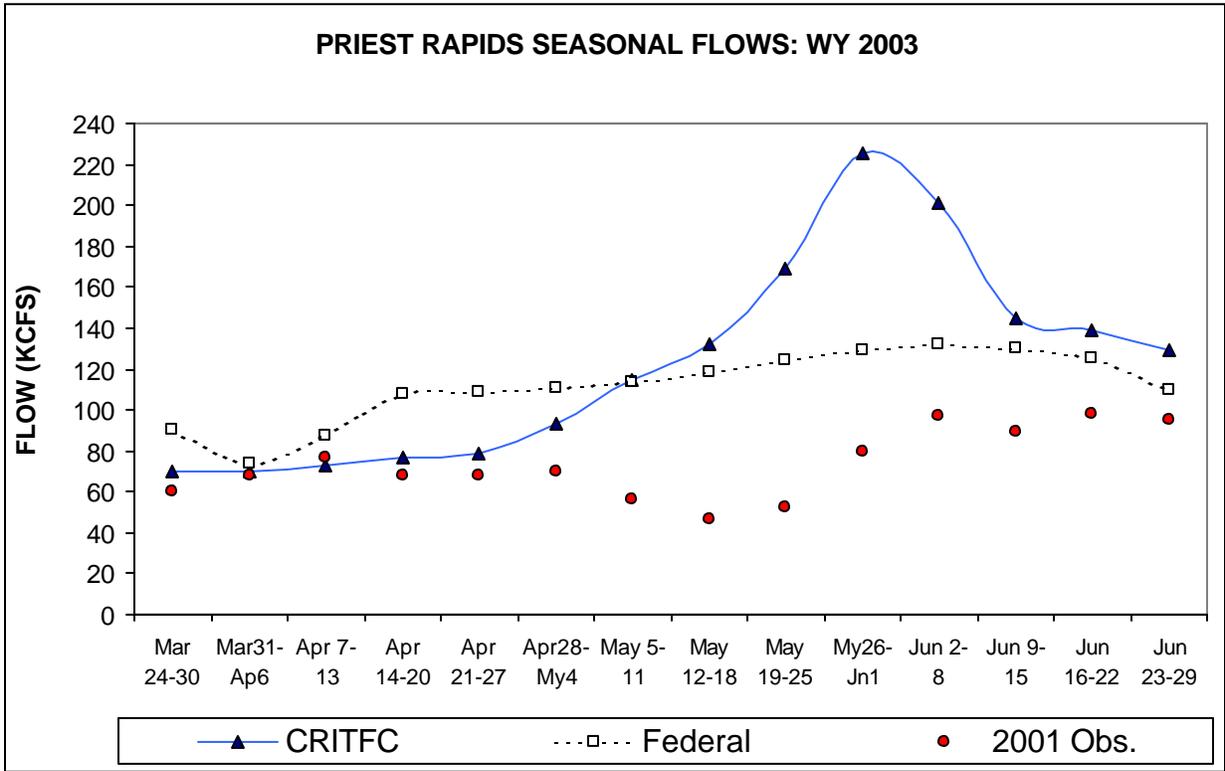


Figure 2. 2003 CRITFC River Operations Plan hydrograph for the Columbia at Priest Rapids compared to 2001 observed river flows and likely 2003 river flows under federal operations.

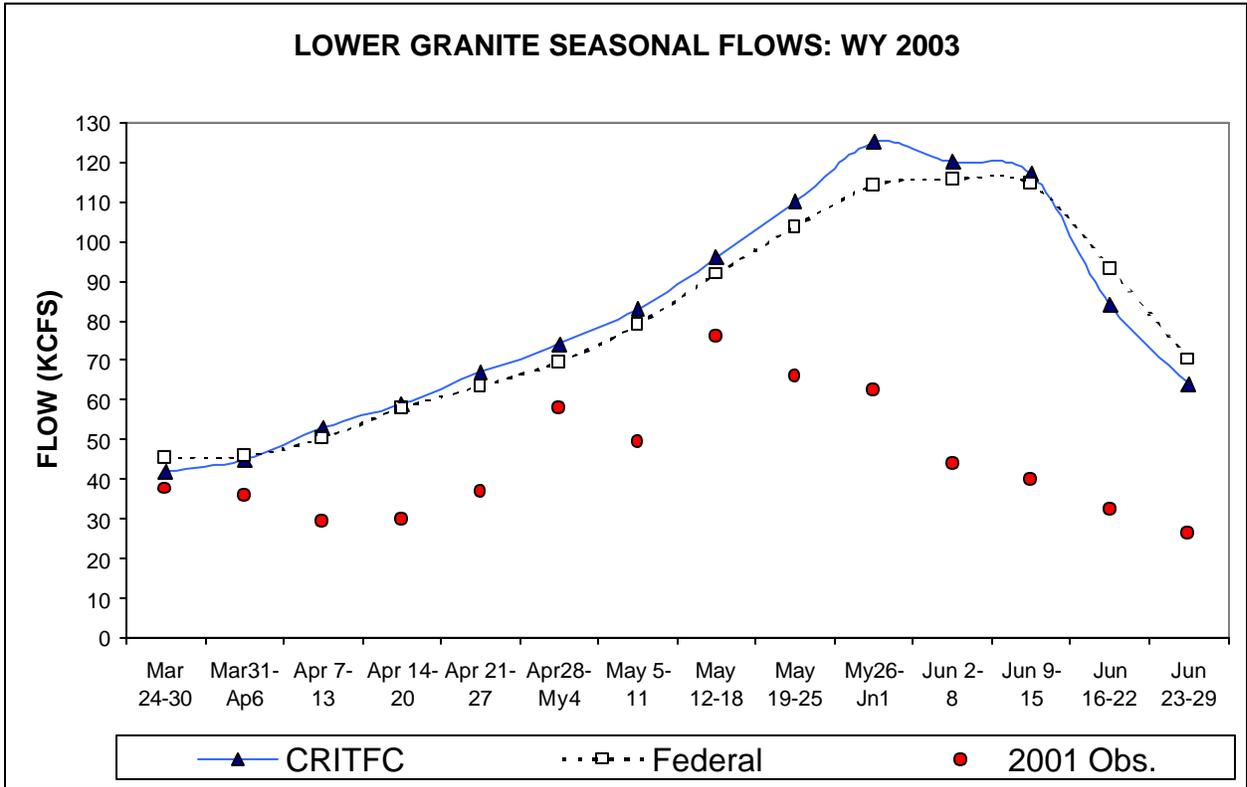


Figure 3. 2003 CRITFC River Operations Plan hydrograph for the Snake at Lower Granite compared to 2001 observed river flows and likely 2003 river flows under federal operations.

SYSTEM FLOOD CONTROL: UPPER RULE CURVE (URC), as modeled in GENESYS GRAND TOTAL:

WATER YEAR 2003 (average of WY 1929-31, 1937, 1941, 1944, and 1973)

KaF: 

<b>6628</b>
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<i>January 31st, KaF:</i>	<b>CRITFC</b>	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Arrow, BC	5553.4	1431.8	5355.1	1430.1	198.3	
Libby	3496.1	2424.6	3496.1	2424.6	0.0	
Hungry Horse	2741.2	3546.0	2741.2	3546.0	0.0	
Grand Coulee	5184.8	1290.0	5185.0	1290.0	-0.2	
Brownlee	975.2	2077.0	975.2	2077.0	0.0	
Dworshak	1420.0	1565.2	1221.7	1551.7	198.3	<b>396</b>
<i>February 28th, KaF:</i>	<b>CRITFC</b>	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Arrow, BC	5747.5	1433.4	5152.6	1428.5	595.0	
Libby	3920.6	2435.0	3920.6	2435.0	0.0	
Hungry Horse	2737.5	3545.9	2737.5	3545.9	0.0	
Grand Coulee	5145.5	1289.5	5050.2	1288.3	95.2	
Brownlee	975.2	2077.0	975.2	2077.0	0.0	
Dworshak	1855.6	1591.3	1373.6	1562.1	481.9	<b>1172</b>
<i>March 31st, KaF:</i>	<b>CRITFC</b>	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Arrow, BC	6257.3	1437.4	4922.1	1426.5	1335.2	
Libby	4295.0	2443.7	4295.0	2443.7	0.0	
Hungry Horse	2779.1	3547.7	2779.1	3547.7	0.0	
Grand Coulee	5184.8	1290.0	4561.3	1282.0	623.6	
Brownlee	975.2	2077.0	975.2	2077.0	0.0	
Dworshak	2015.0	1600.0	1733.0	1584.4	282.0	<b>2241</b>
<i>April 15th, KaF:</i>	<b>CRITFC</b>	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Arrow, BC	6021.7	1435.6	5625.0	1432.4	396.7	
Libby	4546.3	2449.5	4546.3	2449.5	0.0	
Hungry Horse	2806.2	3548.9	2806.2	3548.9	0.0	
Grand Coulee	5184.8	1290.0	4593.6	1282.5	591.2	
Brownlee	975.2	2077.0	975.2	2077.0	0.0	
Dworshak	2005.0	1599.5	1855.0	1591.3	150.0	<b>1138</b>
<i>April 30th, KaF:</i>	<b>CRITFC</b>	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Arrow, BC	5842.6	1434.2	5644.3	1432.5	198.3	
Libby	4693.3	2452.7	4693.3	2452.7	0.0	
Hungry Horse	2851.9	3550.8	2851.9	3550.8	0.0	
Grand Coulee	5184.8	1290.0	4647.2	1283.1	537.7	
Brownlee	975.2	2077.0	975.2	2077.0	0.0	
Dworshak	2012.1	1599.8	1877.6	1592.5	134.5	<b>870</b>
<i>May 31st, KaF:</i>	<b>CRITFC</b>	(elev.)	Federal Plan	(elev.)	Difference (KaF)	Sum Total
Arrow, BC	6417.5	1438.7	6020.9	1435.6	396.7	
Libby	4694.5	2452.7	4694.5	2452.7	0.0	
Hungry Horse	2974.2	3556.0	2974.2	3556.0	0.0	
Grand Coulee	5184.8	1290.0	4792.4	1285.0	392.5	
Brownlee	975.2	2077.0	975.2	2077.0	0.0	
Dworshak	2010.5	1600.0	1989.7	1598.6	20.8	<b>810</b>

Table 2. Flood control Upper Rule Curves, as modeled in the NPPC GENESYS Hydro model.

## 2003 Spill Program for the Columbia Basin

The 2003 River Operations Plan recommends a program to increase spill at key projects in order to significantly increase overall passage success and survival for the 2003 juvenile and adult migrants. Runoff for the Snake River is projected to be even lower than 70% of normal projected for the lower Columbia. Federal Operators are planning their operations around this value, even though the forecast is very likely to decline over winter.

Principal features of this spill program include:

- Provision for summer spill at Snake River and McNary dams. The current NMFS 2000 FCRPS Biological Opinion does not require summer spill, despite the lack of scientific evidence that indicates transporting summer migrants would be advantageous compared to spilling migrants over dams. CRITFC has advocated for a summer spill program and transport study (with summer spill) in the Lower Snake River for at least the last five years. This controversy was expressed in the fall fishery negotiations in *U.S. v. Oregon* in the last several years. CRITFC will continue to oppose any Snake River or McNary transport study that does include a reasonable spill and flow component.
- Provision for daytime spill at John Day, McNary and Lower Snake River dams. When implemented, daytime spill has been demonstrated to be as successful or more so than nighttime spill at most dams. Early migrations of abundant 2003 fall chinook migrants from the Hanford Reach will achieve better protection from daytime spill at McNary and John Day than under no spill conditions.
- Extension of spill season. The Plan also recommends that the spill season be extended in duration over that offered in the NMFS 2000 FCRPS Biological Opinion. Because mainstem river temperatures have been much warmer than in past years, it is very likely that juvenile migrations will start earlier than in the past and kelts will be migrating and need downstream protection. Early spill will better protect spring chinook kelts emigrating seaward. Recent radio-telemetry studies indicate that about half of steelhead spawners return to sea and that spill increases kelt survival (English et al. 2001; English et al. 2003; Evans et al. 2001; Evans 2002).<sup>5</sup> Spill should begin at mainstem dams around March 20, depending on the status of the migrations. Depending on monitoring assessments, spill should be extended to September 15 at lower Columbia Dams to assist millions of late migrating juvenile salmon and to reduce powerhouse injuries to adult steelhead and fall chinook that fall back at dams.
- Real-time spill ramping impacting fish passage goals. During the 2002 spill season, spill levels were ramped up and down depending on the TDG readings from monitoring sites

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<sup>5</sup> Telemetry data from these studies indicate that in 2001 with no spill and screen system turbine passage, only 3.8% of radio-tagged kelts survived from Lower Granite Dam to the Bonneville Dam tailrace. These studies indicate that if spill and sluiceway passage is provided, 86-93% of kelts will use these routes, which insure substantially higher survival rates through the dams.

below dams. Atmospheric conditions, combined with temperature greatly influence the accuracy of TDG monitoring sites. Depending on exceedences of TDG levels that would violate gas waivers from the state water quality agencies, spill levels were reduced to levels well below the TDG waiver levels, and this condition was left for several hours. Thus, spill volumes required in the NMFS 2000 FCRPS Biological Opinion were not provided. It appears to CRITFC that Corps' actions to hold spill at levels below the gas waivers for hours after reducing spill is negatively impacting regional passage goals. For example, total dissolved gas levels at Bonneville's tailwater location are quite variable and these levels can impact spill operations at Bonneville, The Dalles and, to a lesser degree, John Day. It is our understanding that the Corps has set up a protocol to deal with ramping down spill when the monitoring sites are above the standard, however, a protocol for the real-time expedited ramping up of spill when the monitoring sites are under the gas waiver and the spill level is lower than intended in the NMFS 2000 FCRPS Biological Opinion has not been completed. The Corps should install the capacity to resolve this issue at all Corps dams by implementing project operational measures in the 2003 Fish Passage Plan and ensure that all dam operators closely follow the measures.

#### Priorities:

Bonneville (BON). Spill is very effective and efficient at Bonneville. Past survival studies indicate that the for juvenile migrants, spill resulted in a relative survival to the estuary of 98% compared to screen bypass and turbine passage survival of 80% and 82% respectively. Recent installation of spillway deflectors decreased total dissolved gas levels to allow increased spill levels. CRITFC recommends daytime spill in blocks of 75 kcfs and up to the gas waiver limits (about 150 kcfs) to examine fallback issues and nighttime spill of 150 kcfs. At least three days of spill should be allocated at these levels to protect release of the Spring Creek Hatchery fall chinook migration during Mid-March.

McNary (MCN). McNary is the only Lower Columbia dam that is not scheduled to have voluntary spill 24 hours a day in either spring or summer. The Plan's recommended hydrograph will create some involuntary spill at McNary as the powerhouse is hydraulically limited for flows up to about 140 kcfs. McNary passes a substantial number of Columbia Basin salmon from the Mid-Columbia, Snake River and Hanford Reach. The existing screened bypass system has structural and hydraulic problems; PIT-Tag studies indicate that juveniles that experience multiple screen bypass passage have lower smolt-to-adult returns than juveniles that pass thorough spill and turbines (Bouwes et al. 2002; Budy et al. 2002). Of about 200,000 juvenile spring chinook marked and released in 1995 from the bypass system, no adults returned. Transportation results to date have been equivocal. Thus, to spread-the-risk<sup>6</sup> and encourage better tailrace egress conditions to avoid predators and delay, the Plan recommends that the Corps provide daytime spill at a level commensurate with the current nighttime Biological Opinion spill operation. Further, the Plan recommends that the Corps consider removing half of

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<sup>6</sup> Under the CRITFC Plan, "Spread the risk" entails an operation where approximately half of the migrants are passed through the dam via surface bypass and/or spill and the other half are passed through turbine screened systems and transported in trucks or barges.

the turbine intake screens especially during the summer months when river temperatures often exceed the water quality standard.

The Dalles (TDA). Due to concerns with juvenile turbine passage (survivals in the low 80% range; 2000 FCRPS Opinion, Appendix D), it is prudent to increase non-turbine passage routes, which include the sluiceway and spillway. Spill is the only passage route that can immediately increase juvenile passage survival. The 1995-1998 FCRPS biological opinion required spill at 64% of daily average flow. Based upon questionable survival studies, NMFS decreased spill to 40% of daily average flow. This subjects more juveniles to turbine passage. The CRITFC Plan recommends an increase in spill from the 2000 FCRPS Opinion level from 40% to 50% of daily average flow. North loading of the spillway with these flows would avoid placing juvenile salmon toward shallow island predation zones where they were placed with the 64% spill. The 2003 research and fish passage at TDA is best served by maintaining a constant spill level during the migration season.

John Day (JDA). Critical uncertainties remain regarding spill operations at John Day. Research in 2001 (Beeman, Counihan et al. USGS, 2001) indicated that radio-tagged juveniles using the screened bypass outfall had a direct survival of 88-92%, while juveniles passing through spill survived in the 98-100% range. CRITFC proposes the best operation would be 30% of daily average flow during the day with 45 – 50% daily average flow at night. Night spill is very effective at passing fish. However the large volume of spill required to generate the high fish passage efficiency appears to create poor conditions at the screened bypass outfall, which in 2002, may have led to lower survival. (Beeman and Counihan 2002) Because indirect mortality rates and lowered smolt-to-adult survival rates occur for smolts that pass through screened bypass systems and bypass systems select against juvenile lamprey and certain salmon stocks, we recommend maximizing spill at John Day and examining fish passage without turbine intake screens through comparative survival studies as a high priority. In the future, to increase passage we recommend investigations of removable spillway weirs or similar surface spill options at JDA to increase fish passage efficiency. Current estimates for turbine passage in 2002 were extremely low with large confident intervals. Therefore, it is prudent to reduce the exposure of juveniles to the powerhouse and potential turbine passage.

Lower Monumental (LMN). With the repairs to the stilling basin complete, CRITFC strongly recommends the implementation of 24-hour spill for spring migrants and summer migrants. Transportation at Lower Monumental for spring migrants has shown to return fewer adults than Lower Granite, indicating that some serious problem in the screened bypass system or transportation system may be selecting against migrants. Summer migrant transportation has not been examined yet, but results from summer migrant transportation at McNary are not encouraging. We recommend spread the risk for migrants at this project and comparative survival studies that require removal of turbine intake screens.

Little Goose (LGS). Currently, under the 2000 FCRPS Biological Opinion, the Corps does not provide daytime or summer spill. CRITFC strongly recommends the implementation of 24-hour spill for spring migrants and summer migrants. Smolt-to-adult survivals for juveniles that pass through screened bypass systems indicate fewer adults lower rates than for juveniles that pass through non-screened bypass routes. Spring transportation at Little Goose has been equivocal

(Bouwes et al. 2002), thus, CRITFC recommends a spread the risk approach for juvenile migrants with about half passed in spill and the other half transported. Summer migrant transportation has not been examined yet, but results from summer migrant transportation at McNary are not encouraging. We recommend spread the risk for summer migrants at this project and comparative survival studies that require removal of turbine intake screens.

Lower Granite (LWG). For 2003, the Corps has left the removable spillway weir (RSW) installed in an attempt to increase fish passage effectiveness. CRITFC believes that the weir, with some auxiliary spill, should be tested in 2003 against spill at levels that approach total dissolved gas cap limits to determine if there is a difference in project fish passage efficiency (FPE). Auxiliary spill should be set at 22 kcfs to insure that juveniles are provided the best possible tailrace egress conditions, and that they are attracted to the RSW zone of influence in the forebay. RSW/spill tests should only compare two conditions to insure that there are adequate test blocks to insure results have statistical precision and robustness. It is vital to test the performance of the RSW at Lower Granite for summer migrants.

Ice Harbor (IHR). For 2003, CRITFC recommends a comprehensive study to evaluate passage as a whole at Ice Harbor. Several survival studies have been done at IHR in recent years with a large variety in survival estimates for both spring and summer. (Eppard et al. 2002) It appears that high spill volumes in low tail water and low flow conditions do not provide good passage for juveniles. Whether this problem is due to mechanical/hydraulic conditions at the spillway, predation below the spill, or some combination of these factors is unclear. CRITFC recommends conducting a study that compared a nighttime spill level less than the 100-kcfs/TDG cap to the existing spill level. Further refinement and study of the current spill patterns should also be examined to insure the best egress conditions possible.

Refer to Table 3 for the details of project spill operations. All proposed operations conform to existing total dissolved gas constraints.

Rock Island. This project still is under the authority of the Rock Island Settlement Agreement and established spill conservation account, despite incomplete Habitat Conservation Plan development. Chelan PUD should coordinate project spill with fishery managers through the Mid-Columbia Coordinating Committee. Spill should begin and end at the direction of the Committee, and should be provided at a minimum rate of 31 kcfs consistent with the 2000 spill program.

Rocky Reach. This project is still under the authority of the Mid-Columbia FERC proceedings, despite incomplete Habitat Conservation Plan Development. Chelan PUD should coordinate project spill with fishery managers at the direction of the Committee. Spill should begin and end at the direction of the Committee, and should be provided at a minimum rate of 20% of daily average flows.

Wanapum. Spill should be provided as specified by the 2000 Spill Memorandum of Agreement (MOA) between Grant PUD and the Joint Fishery Parties. The Agreement specifies that Grant will spill 43% of daily average flow in the spring and 49% of daily average flow in the summer to pass 95% of the juvenile migrants and meet an 80% FPE and 95% survival standard estimate.

The beginning and end of spring spill is determined by the Mid-Columbia Coordinating Committee and the beginning of summer spill is June 15 or when fish are present, whichever occurs first and ends between August 15 and August 30 based upon in-season monitoring.

Priest Rapids. Spill should be provided as specified by the 2000 Spill Memorandum of Agreement (MOA) between Grant PUD and the Joint Fishery Parties. The Agreement specifies that Grant will spill 61% of daily average flow in the spring and 39% of daily average flow in the summer to pass 95% of the juvenile migrants and meet an 80% FPE and 95% survival standard estimate. The beginning and end of spring spill is determined by the Mid-Columbia Coordinating Committee and the beginning of summer spill is June 15 or when fish are present, whichever occurs first and ends between August 15 and August 30 based upon in-season monitoring. Spill at Priest should be increased by an equal amount of spill foregone at Wanapum if total dissolved gas restrictions limit Wanapum spill from achieving MOA required percentages.

**Table 3. 2003 River Operations Plan Spill Program**

<b>Project</b>	<b>BiOp Spill Spring</b>	<b>CRITFC Plan</b>	<b>BiOp Summer Spill</b>	<b>CRITFC Plan</b>
<b>BON</b>				
Day	75 kcfs	75kcfs vs. 120-150 kcfs	75 kcfs	75 vs. 120-150 kcfs
Night	120-150 kcfs (Cap)	120-150 kcfs (Cap)	120-150 kcfs (Cap)	120-150 kcfs (Cap)
<b>TDA</b>				
Day	40% of flow	50% of flow	40% of flow	50% of flow
Night	40% of flow	50% of flow	40% of flow	50% of flow
<b>JDA</b>				
Day	0	30%	0	30% vs. 60%
Night	60% flow or max 180	45%	60% of flow	60%
<b>MCN</b>				
Day	0	50%	0	50%
Night	50% of flow	50%	0	50%
<b>IHR</b>				
Day	45 kcfs	45 kcfs	0	45 kcfs
Night	100 kcfs	65 kcfs vs. 100 kcfs	0	65 kcfs vs. 100 kcfs
<b>LMN</b>				
Day	40 kcfs (Gas Cap)	40 kcfs	0	30 kcfs
Night	40 kcfs (Gas Cap)	40 kcfs	0	40 kcfs
<b>LGS</b>				
Day	0	45 kcfs	0	30 kcfs
Night	45 kcfs (Gas Cap)	45 kcfs	0	45 kcfs
<b>LGR</b>				
Day	0	22 kcfs vs. 60 kcfs	0	22 kcfs vs. 60 kcfs
Night	60 kcfs (Gas Cap)	60 kcfs (Gas Cap)	0	60 kcfs (Gas Cap)

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## Attachment 3

### 2003 Hanford Protection Operations to Reduce Juvenile Hanford Reach Fall Chinook Stranding and Mortality

Power peaking causing flow fluctuations from federal and FERC licensed dams in the mid-Columbia River can be extreme (Figure 4), with shoreline water levels varying up to 13 feet over a 24 hour period. When this occurs during the early emergence and migration of Hanford fall chinook from redds, hundreds of thousands of fry are stranded in pools or other entrapments left by the receding river. Fry are susceptible to avian or fish predation, thermal shock, stress and desiccation. Most of the significant stranding occurs with shoreline fluctuations of 1-3 feet (Wagner et al. 2000). Fluctuations at flows of 120 kcfs and under are especially problematic because they dewater significant shoreline areas and cause greater risks of stranding (Table 4). Due to 2003 drought conditions, flows are likely to be in this range, thus, CRITFC recommends no more than plus or minus 10 kcfs changes in mainstem flows in the Reach over a 24 hour period measured from noon to noon the prior day.

Biological and hydrological monitoring of the stranding has occurred since 1998 with funding provided by BPA and Grant PUD. The tribes and fishery agencies initially recommended that ever increasing or stable flows be provided in the Reach, consistent with the recommendations of the NPPC's Independent Scientific Advisory Board (Williams et al. 1998). In the CRITFC tribes' *Spirit of the Salmon* restoration plan, fluctuation of no more than 10 % of the previous day's average flow in the Reach was recommended. However, the federal and mid-Columbia FERC power operators claimed that this operation could not be accomplished because of power needs. Instead they offered regimes that targeted flow fluctuations to plus or minus 20-40 kcfs over the previous 24-hour flows. Tribes and fishery agencies were left with no recourse and could but monitor the dead and stranded salmon over the next three years.

In 1999-2001, the federal and mid-Columbia FERC power operators implemented an operational regime aimed at limiting flow fluctuations to reduce stranding. In 1999, the operators attempted to keep flow fluctuations within a plus or minus 20 kcfs range. In other words, the river flow levels from Priest Rapids dam could fluctuate up to 40 kcfs in a 24-hour period. The estimated fry "at risk" of mortality<sup>7</sup> from these levels for 17 miles of the Reach (about one third of the Reach) in 1999 was about 382,000 and about 255,000 in 2000. The confidence intervals around these estimates were wide because more sampling effort is needed. The overall annual fry production for the Reach has been estimated by WDFW as 16-27 million salmon.<sup>8</sup> The operators believed that these losses were acceptable as a cost of doing business for regional power production. To date, no mitigation or compensation for these losses has been offered by the operators.

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<sup>7</sup> "At risk" are fry that have been stranded and are not likely to get passage back to the river in time to avoid predation, thermal shock or other mortality.

<sup>8</sup> The reader should note the difficulties and uncertainties in deriving these estimates in footnote four and text below.

In 2001, the operators wanted greater power peaking flexibility, thus, they proposed a flow fluctuation of 40-80 kcfs in a 24-hour period. Given the extreme low flow conditions, with the second worst runoff conditions in the 70-year record, CRITFC objected to this flow band and proposed no more than a 10 kcfs fluctuation in a 24 hour period. The fishery agencies and operators agreed to proceed with up to a 40-80 kcfs band. The result was more than a four-fold increase for “at risk” fry or an estimate of about 1.6 million fry.

Based upon 1) review of the four years susceptibility data, 2) additional information supplied by the USFWS on dewatered areas below Priest Rapids Dam and, 3) taking into account likely 2003 Hanford Reach flow regimes from 50-200 kcfs, we recommend the specific operations provided below. These are offered to reduce stranding impacts on Hanford Bright fall chinook, ESA-listed steehead and Pacific Lamprey. In order to achieve the recommended flow bands, the federal operators should limit power peaking from Grand Coulee and release additional water on weekends to assure the FERC-licensed operators can keep the flows within the CRITFC recommended 10-20 kcfs maximum flow fluctuations. During the period of high fry stranding susceptibility, if necessary, the federal operators should rely on other generation sources than Grand Coulee to meet power contract obligations to reduce flow fluctuations. In turn, the Mid-Columbia FERC operators, in particular Grant PUD, will have to fill reservoirs on Fridays to assure that appropriate Reach flows would be maintained over weekends when reduced power demand and/or flood control operations limit upriver flows from federal dams.

Monitoring of stranding impacts and overall loss estimates for the middle section of the reach will be implemented by Grant PUD and WDFW using similar methods and effort as in 2002. For 2003, CRITFC, WDFW, and the Yakama Nation will expand sampling efforts to the entire Reach based upon a stratified sampling design that focuses on entrapments. The USGS plans on studying behavioral aspects of stranding in conjunction with these efforts.

The following are CRITFC’s recommendations for 2003 operational constraints for flow releases below Priest Rapids Dam to reduce mortality of emerging and rearing juvenile fall chinook in the Hanford Reach. In 2002, a large escapement of adult chinook will create an estimated 40 million fry into the Reach. Due to much warmer temperatures than normal these fry have already begun to emerge from the redds. To protect this significant productivity, it is critical that the following criteria be implemented by the federal and Mid-Columbia PUD operators.

## 2003 Hanford Juvenile Fall Chinook Flow Recommendations

### Starting Program Operating Constraints

Seining of the six established index sites will be conducted three days per week (Monday, Wednesday, and Friday) beginning one week prior to the estimated start of emergence. Once a daily total of 50 sub-yearling fall chinook salmon fry are captured, a daily flow fluctuation constraint of 40 kcfs would be imposed. This constraint will continue until a daily total of 100 fry are captured from the index sites at which time the following proposed flow constraints will be implemented. After the 100 chinook criteria have been met, index sampling would be decreased to once weekly (Wednesday).

#### **When PRD daily discharge is between 36 and 80 kcfs.**

When average daily discharge at Priest Rapids is between 36 and 80 kcfs, the mid-Columbia projects will limit flow fluctuations to no more than 10 kcfs in a 24-hour period.

- Flow bands between 36 and 80 kcfs dewater the most area with the least amount of fluctuation and have the most potential for catastrophic fish kills.
- River configuration - long shelves, and shallow water entrapments, substrates that heat up or drain quickly.

#### **When PRD daily discharge is between 80 and 110 kcfs.**

When average daily discharge at Priest Rapids is between 80 and 110 kcfs, the mid-Columbia projects<sup>9</sup> will limit flow fluctuations to no more than 10 kcfs in a 24-hour period.

- Flow bands between 80 and 110 kcfs hold optimal rearing habitat. Data suggests these areas hold large entrapments and some stranding sites including backwater sloughs with good rearing habitat.
- These flow bands are located at the upper most reaches of the lower river shelves. Evaluation years 1999 and 2000, showed the highest susceptibility areas between 80 and 120 kcfs.

#### **When PRD daily discharge is between 110 and 140 kcfs.**

When daily average discharge is between 110 and 140 kcfs, the mid-Columbia projects<sup>1</sup> will limit fluctuations to no more than 20 kcfs in a 24-hour period.

- Data suggests that flow bands between 120 and 190 kcfs offer reduced susceptibility but not in the reach directly below Priest Rapids Dam.

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<sup>9</sup> The mid-Columbia projects refer to Grand Coulee, Chief Joseph, Wells, Rocky Reach, Rock Island, Wanapum and Priest Rapids that are operated under mid-Columbia hourly coordination agreements.

- River configuration - steep banks, area of exposed shoreline drop significantly between 110 and 140 kcfs.

### **When PRD daily discharge is between 140-170 kcfs**

When daily average discharge is between 140 and 170 kcfs, the mid-Columbia projects<sup>1</sup> will limit fluctuations to no more than 20 kcfs in a 24 hour period.

- Data suggests that flow bands between 120 and 190 kcfs offer reduced susceptibility in the SHOALS reach, but not in the reach just below Priest Rapids Dam.

### **When PRD daily discharge is 170 kcfs and above**

When daily average discharge is 170 and above, the mid-Columbia projects<sup>1</sup> will limit fluctuations to no more than 20 kcfs in a 24-hour period. A minimum hourly flow of 150 kcfs will be maintained.

- Constraints will protect the backwater areas of the sloughs (Hanford Slough and White Bluffs Slough) from dewatering.

### **Ending Program Operating Constraints**

CRITFC and WDFW recommend that flow constraints be terminated after the accumulation of 1400 temperature units (TU) past calculated end of spawning under the Vernita Bar Settlement Agreement.

- Evaluations from 1999, 2000, and 2001 show that susceptibility drops significantly after 1200 TU's and after 1400 TU it is assumed that susceptibility has reduced to allow for termination of constraints. The last fish found stranded and entrapped in 1999 and 2000 fell relatively close to 1400 TU's. The 2001 evaluation showed fish becoming entrapped and stranded past this deadline but at decreased rates.



**Table 4. Flow bands and number of stranded and entrapped juvenile fall chinook salmon found on the Hanford Reach of the Columbia River in 2002 (From WDFW 2003).**

<b>Flow Band (kcfs)</b>	<b>Total Shoreline Within Study Area (hectares)</b>	<b>Number of Flow Fluctuations During Season</b>	<b>Shoreline Exposed During Season (hectares)</b>	<b>Number of Plots Sampled</b>	<b>Area Sampled (hectares)</b>	<b>Number of Plots with Chinook</b>	<b>Number of Chinook Found at Risk</b>	<b>Number of Chinook Found at Risk per Hectare</b>
50-80	1,234.64	2.98	3,683.97	28	7.03	12	98	13.93
80-120	1,203.43	4.90	5,895.14	36	8.84	6	65	7.36
120-160	701.12	18.54	12,997.51	51	15.42	7	15	0.97
160-200	767.48	20.00	15,347.91	44	10.16	3	8	0.79
200-240	691.96	9.82	6,797.96	27	7.21	0	0	0.00
240-280	569.80	8.83	5,031.03	8	2.18	1	2	0.92
<b>Total</b>	<b>5,168.43</b>	<b>65.07</b>	<b>336,320.91</b>	<b>194</b>	<b>50.84</b>	<b>29</b>	<b>188</b>	<b>3.70</b>

#### **Attachment 4**

##### **BPA-Idaho Power Company Water and Power Exchange**

From the late 1980's until April 2001, BPA and Idaho Power Company (IPC) were engaged in annual exchange contracts for water and power. Typically, IPC would store water in the Hells Canyon Complex (Complex) in early spring and BPA would provide a power exchange to IPC. This storage would be released later in spring for salmon. The power generated from this release was sent back to BPA.

In the late summer, IPC would release storage and generate power, which would be sent to BPA. BPA would replace this power in September, which allowed IPC to store water to meet project elevations and assure that enough water was on hand for Hells Canyon fall chinook spawning.

In 1995, after release of the 1995-1998 FCRPS Biological Opinion, firm water exchange volumes and timing were established in contracts to meet Opinion RPAs. A five-year contract was finalized for power and water exchanges in 1996. In early May, IPC would release 110 KaF, and send power to BPA. BPA would send the power back to IPC the latter half of May and

refill the Complex. In summer, IPC would 1) release 237 KaF from the Complex and 2) shape and pass 427 KaF of Bureau of Reclamation water through the Complex. The power generated from these releases was sent to Bonneville. Bonneville would send exchange power for the 237 KaF to IPC in September and send exchange power for the 427 KaF back to IPC the following winter.

Because power markets are more lucrative in summer months, BPA claimed that IPC gained a substantial financial advantage in the contract arrangement. BPA negotiated with NMFS to have the power exchange contract omitted from the 2000 Biological Opinion and the five-year contract expired on April 1, 2001. During 2001 and 2002 negotiations with the federal operators, the CRITFC tribes, Oregon and Idaho all pressed BPA to renew the exchange contracts with IPC. BPA claimed that they were at a financial disadvantage, thus, were unwilling to renew the contract, despite long negotiations with IPC that involved the Idaho Governor's office.

Without the contract in place, it appears difficult but not impossible for IPC to: 1) assure that the 427 KaF or additional upper Snake water will be shaped and passed through the Complex, 2) assure that the 110 KaF and 237 KaF will be provided in a timely manner for fish. This would assure that salmon obtain the water critical to their migrations, habitat and survival.

IPC recently released a draft license application for relicensing of the Complex, and is still engaged in ESA consultation for the Complex. In CRITFC comments on the draft license application, CRITFC analyses utilizing the GENESYS hydrologic model<sup>10</sup> indicate that, in nearly all water years on record, a discrete 450 kaf<sup>11</sup> could be delivered downstream from Brownlee storage primarily in July for anadromous fish to meet the Opinion's Lower Granite target flows and the recommendations in the tribal recovery plan, *Wy-Kan-Ush-Mi Wa-Kish-Wit* (Nez Perce et al. 1995). These analyses show that in nearly all years, inflows into the Complex leave enough water to provide a minimum of 9.5 kcfs for fall chinook spawning flows in late September through early November, with spawning flows up to 13 kcfs possible in higher flow years. In addition, delivery of Complex water in July to the lower Snake would allow more judicious use of Dworshak Reservoir storage for temperature control. Idaho Power should conduct analyses that examine the potential for supplying 450 KaF, primarily in July, for flow augmentation in all water years while assuring that at least 9.5 kcfs is available for fall chinook spawning and rearing flows below the Complex.

Renewal of the BPA-IPC water exchange contract is important to facilitate vital flows downstream of the Complex for listed Snake River chinook and steelhead and endangered Snake River sockeye. Nonetheless, IPC has an obligation as a competent licensee to provide equitable treatment for salmon by providing the above storage volumes for flow augmentation.

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<sup>10</sup> The GENESYS model was developed by the Northwest Power Planning Council as a basinwide hydrologic model. It incorporates water routing through the Federal Columbia River Power System using a data set of 50 years of historical runoff (WY 1929-1978).

<sup>11</sup> The 450 KaF should be contributed directly from Brownlee Reservoir. Bureau of Reclamation water from the upper Snake could be passed through in addition to the 450 KaF from Brownlee.

## **Attachment 5**

### **Fish Facility Operations Recommendations**

CRITFC has submitted the following comments and recommendations to the Corps' draft 2003 Annual Fish Passage Plan. We reference these comments that identify important changes to federal dam fish passage facilities and suggest research to better protect anadromous fish.

January 30, 2003

Brigadier General David Fastabend  
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Northwest Division, Corps of Engineers  
P.O. Box 2870  
Portland, OR 97208-2870

**RE: Comments on Corps' 2003 Fish Passage Plan for FCRPS Dams**

Dear General Fastabend:

Thank you for providing us with a review copy of the Corps' draft 2003 Fish Passage Plan (FPP). Unfortunately the draft was delayed this year which has caused a delay in review and providing final comments. We have reviewed the document and provide the following comments and recommendations. We request that the Corps provide us with a written, detailed response to our recommendations and comments by April 1 to facilitate discussions between the Corps and regional fishery managers in the Fish Passage Operations and Maintenance Subcommittee (FPOM) before the onset of the 2003 anadromous fish migrations. In the event the Corps cannot implement certain CRITFC recommendations, we ask that the Corps provide their justification for not implementing these recommendations in writing.

#### **General Comments**

The Corps should create a post-season assessment report of 2003 FPP actions with a check- list. Projects and criteria that were successfully implemented should be specified as well as those projects that were not implemented. This review would provide accountability and a focal point for end of year FPOM discussions and a preliminary framing of issues for the 2004 FPP.

Funding provided in the 2003 operations and maintenance budget for specific projects should be presented as an appendix in the 2003 FPP. A list of funded and unfunded projects is vital for the region to gain a sense of which projects have funding and where funding gaps exist that are preventing completion of important operations and maintenance projects.

Evans and Beaty (2001) and Evans (2002) noted that steelhead kelts prefer to use surface bypass routes such as sluiceways. This same research concluded that kelts that passed via spillways or sluiceways seem to have better long-term survival. Wagner and Hilson (1993) noted that a significant number of adult steelhead that fall back through turbine intake screen systems at McNary Dam suffered a high percentage of visible bruises. Thus, CRITFC recommends that all dam sluiceways be in use 24 hrs a day to insure accessibility for kelt passage and that spill be implemented at dams before April 10 if kelts are present, and after August 31 if adult fall chinook and steelhead are present.

In 2001, it became evident to CRITFC that the Corps' dam biologists were short-staffed and had a difficult time maintaining a schedule which requires 3 daily inspections of all fish passage facilities. In 2001, the Corps and CRITFC combined efforts to give Salmon Corps members access to Lower Columbia dams. Salmon Corps members assisted Corps of Engineers biologists in fish facility inspections and other routine tasks. This resulted in better inspection capacity of fish passage facilities. We will continue to work with the Corps through the tribal partnership program to secure Salmon Corps dam monitoring programs for 2003 and outyears. We believe that this program should be mentioned in the FPP.

The checklist for adult/juvenile fishway inspections at each project should be included in the 2003 FPP, possibly in an appendix and/or should be reviewed by FPOM before the fish migration season starts.

Special low flow operations should be outlined in the 2003 FPP to take advantage of any lessons learned from low flows in 2001 to insure that the facilities are operated to create the best possible passage conditions.

In 2003 there will be a spring chinook fishery in April for 1 week. There will also be a fall fishery, which generally occurs from the third week in August through the third week in September. The fall fishery usually occurs Tuesday through Saturdays, or as set by the Columbia River Compact. Pool fluctuations in Zone 6 (Bonneville to McNary Dam) during the tribal treaty fishery should be limited to a 1-2 feet draft from full pool at each project to facilitate tribal fisheries as a key component of tribal members exercising their treaty rights to fish. While the in-season pool elevations are set by Reservoir Control Center, the pool targets should be outlined in the special operations section of the 2003 FPP.

Under the Corps' Anadromous Fish Evaluation Program, there have been several proposals to install additional temperature monitors in reservoir and in dam juvenile and adult passage facilities. The Corps should maintain the Snake River tri-level thermograph system and the McNary Dam temperature monitoring system. The Corps should install additional temperature monitoring equipment in the south fishway at John Day, McNary and Bonneville fishways, at Snake River dam fishways and anywhere else FPOM deems appropriate. This data

is critical to establish mainstem TMDLs and to comply with the Clean Water Act. Temperature data should be made available or posted on the Internet for real-time management decisions for the salmon managers. The fishways should be operated to reduce temperatures and to meet fishery agency and tribal criteria.

### **Specific Dam Comments**

#### Bonneville Dam

- The daytime spill cap should be changed from 75 kcfs to the total dissolved gas level, which will likely be approved under the state water quality agency temporary waivers for fish spill. The adult passage research from 2000 and 2002 and past years showed little to no correlation between increases of adult fall back and increased spill volumes. The 2003 FPDEP research plan calls for daytime spill in excess of 75 kcfs. Further, with a change from Powerhouse I priority to Powerhouse II the number of adults using the Bradford Island Facility will be greatly reduced. The Bradford Island Ladder accounts for roughly 90% of the adult fallbacks. Preliminary modeling indicates about a 10% percent improvement of survival for juveniles with a Powerhouse II operation and increase in daytime spill. This operational scenario should be verified using the NMFS' SIMPASS model.
- Currently the Bonneville spill pattern is under review for adult migration concerns. If approved by FPOM, the new spill pattern should be incorporated into the 2003 FPP.

2.2.1. Spill level changes. Any Corps decision regarding spill level changes should be made after regional discussion and consultation with the tribes, unless the spill changes are necessary to maintain the dissolved gas waiver in response to an emergency situation. A new system for reducing spill to meet TDG limits has been outlined by the Water Quality Team but to date a system for increasing spill levels to get them back to BiOp levels when TDG levels and spill levels are lower than targets has not been completed to date. We need to insure that BiOp spill levels are maintained whenever possible under the TDG limits.

BON- 11 Table 5 unit priorities needs to be discussed. This table does not reflect current thinking on the unit operations. There has been discussion about not operating B1 MGR units at low end of peak due to fish passage concerns. These items should be discussed and addressed so a recommendation can be made by FPOM.

BON- 18 Need to add language about removal of STS and running of MGRs unit priority as well as leaving some screen installed for fallbacks.

BON-20, 2.4.2.2.b. In past comments to FPPs, we stated our concerns with the actions in this section on fish unit drawdown. The FPOM task group guidelines need to be developed and included in the 2003 FPP before an emergency situation develops. The Corps should ensure that the trash rack at Powerhouse II is compatible with the rake to maximize the effectiveness of debris removal when the system is raked.

BON- 26 2.4.2.5.b-3 Has the new methodology for removing adults, ie, kelts from the separator proven to be adequate or will structural changes be required?

BON- 35 d-1 The floating gates should be open at Powerhouse II

BON-37, 3.2.2.4. and 3.3.2.4. The in-season visual inspection for diffuser malfunctions is not an adequate method for determining problems. A better method of in-season inspection is needed and should be developed by the FPOM members before the start of the passage season. What is the status of this issue?

BON- 44 c Second Powerhouse during time of turbine failure we need to insure that the FPP operations make the most sense when compared with adult tracking information. Certain entrances may get used less and would be the first ones closed.

BON-50, 5.5.1.5. We recommend that the Corps provide some guidelines for kelt identification for approval by FPOM. Kelt identification guides in Evans and Beaty (2001) are recommended.

### **The Dalles Dam**

To our knowledge there is no turbine unit priority at The Dalles Dam. However, after 2002 research, it appears that we need to reconsider turbine unit priority and determine what the turbine priority should be to best protect anadromous fish. Turbine priority should be developed in consensus with the fishery managers.

TDA-8-2.4.1.2. a. – Has the crane used to rake Units F1 through MU5 been repaired? If so it should be included in the FPP. If not, a new criteria needs to be added specifying trash raking or some other means of debris monitoring for Units F1 through MU5.

TDA –9 2.4.1.2.e – There is a need to review the sluice gate opening criteria. Research is being proposed to study what locations make the most sense.

TDA-21, 4.5. As stated above, the Corps should operate all turbines within the 1% peak efficiency band during the fish passage season. Specific to The Dalles, the Corps should have an emergency operational plan for turbine units if they are to be operated outside this criteria. FPOM should review and approve this plan before implementation by the Corps.

### **John Day Dam**

The current spill pattern needs to be updated and field-verified due to the bathymetry changes in the 1:80 model at the Waterways Experiment Station (WES). Regional review of the spill patterns is underway.

2.4.1.3.e. 8 The updated language to the FPP seems appropriate, however the number of adults removed from the sluiceway should be reported to FPOM or in the daily reports. This section should specify where the temperature is obtained as a prelude to determine if dewatering of the box should occur. The 2003 FPP should specify routine box dewaterings at appropriate times (at

least once a month) to assure that adult delay and possible injury are reduced to an absolute minimum. FPOM needs to discuss the option of dewatering in the mornings before temperatures exceed the 70 deg F standard.

Holding of substantial numbers of adult steelhead and chinook in the box for long periods of time is not biologically acceptable. For 2003 we strongly recommend that the Corps begin design investigations for structural remedies to this problem. One possibility could be a crowder that could be used to carefully guide adults out of the dewatering section of the bypass, into the 30 cfs flume, and past the monitoring station.

JDA-7..2.2 Spill Management. The FPP should contain additional language to clearly specify appropriate spillway one operations during the adult fish migration period. We recommend continued use of spillbay one to provide additional attraction flow for adults. This is especially important for fall chinook and steelhead. We recommend that spillway one be operated from March 20 until spring juvenile spill begins and September 1 through November 30. All operations should be coordinated through FPOM.

JDA-22,23..b. North Ladder. The FPP should specify the current capability of the pump system. If more than three pumps can be operated, it should be described in the FPP. Final operations should be approved by FPOM.

JDA-22, 3.3.2.1.a.3 and 4. Radio-telemetry research at Corps' and Mid-Columbia dams indicates that it is advantageous to close the floating orifices before closing or raising the main entrance weirs. This should be specified in the FPP.

## **Walla Walla District Projects**

### **General Recommendations**

CRITFC recommends that half of the turbine intake screens be removed from each dam to create a "spread the risk" scenario. Vertical barrier screens (VBS) inspection schedules should be explicit for each dam. Video inspections might be used where screens cannot be pulled easily to deck level to clean. The FPP should specify that screens with the most use and/or end units generally attract more debris. These screens are the most likely ones to accumulate debris on their VBSs, thus, they should be prioritized for inspection and cleaning.

### **McNary Dam**

CRITFC opposes the speed-no-load turbine operation which are suggested in the FPP to help the fish barges leave the dock. These operations will negatively impact turbine-passed fish and violate peak efficiency turbine criteria. The extent and frequency of these operations should be discussed by FPOM and appropriate changes should be made to the FPP.

There is no section discussing temperature requirements for handling of juveniles. CRITFC has maintained that juvenile salmon should not be handled when temperatures reach and/or exceed

68 degrees F. The Final FPP should have criteria established that conforms to the both water quality standards and the biological needs of the salmon.

The Corps should add language to include reference of PIT-Tag detection systems installed in the McNary fish ladders and the Oregon shore fish count station, as well as the juvenile bypass facility.

MCN-7..c5. Referring to the section, "...[P]lastic covers on orifice chutes maintained...orifice flow is visible." In general, orifice flows are visible but during facility inspections, we are unable to discern whether an orifice is plugged with debris. This is because the flow from the orifice is not a clear jet but is distorted as it discharges through the chute and into the bypass channel. Other means should be used to check for orifice blockages, such as gateway hydraulics. Back-flushing orifices should be accomplished at routine times.

MCN-26 and 27: Referring to the spill schedule - NMFS is expecting that the general McNary model at WES will be used to develop a revised spill schedule for spring 2003, which concurrently considers adults and juvenile passage and gas abatement criteria. A WES trip is scheduled to verify the new spill pattern.

### **Ice Harbor**

What operations and maintenance, if any, have been discussed to reduce the oil leak in the turbine units?. These should be included in the FPP. Is it possible to use a less biologically benign oil in the unit until repairs have been made, such as a vegetable oil product?

### Lower Monumental

LMN-6, 2.1. With the completion of the still basin work and the end bay deflector a new spill pattern will need to be added to the plan. This pattern needs to be verified with the general model.

### **Lower Granite Dam**

LWG-17, 3.1.2.3: Text should be revised per comment discussion last year (similar to section 2.3.1.2.c): "do not close orifices in operating turbine units with ESBSs in place for longer than 5 hours. If possible, keep to less than three hours".

LWG-22 through 29: Include revised tables as they are available.

### *Appendix A, Special Operations*

Overall several critical projects are missing from this section (i.e. Lower Granite spill with the removable spillway weir, ect.). This section needs to be completed and/or updated to allow comprehensive review and comments in the next two weeks.

### **Appendix B - Juvenile Fish Transportation Plan**

CRITFC does not support the current full juvenile transport plan and recommends in-river migration with spill for juveniles. The Corps continues to maximize transportation, especially in trucks, that does not hold up to independent scientific scrutiny. The FPP should reference the findings of the ISAB (98-2) *Response to the Questions of the Implementation Team Regarding Transportation*, with respect to juvenile transportation. There is no temperature, stress, injury or mortality criteria in the FPP for juveniles that must pass through screen and transportation facilities at the Lower Snake dams. This is a key deficiency in the FPP. Fish should not be handled, kept in screen bypass, or transportation facilities when temperatures meet or exceed 68 degrees F. However, the FPP simply states that more care must be taken in handling salmon when these temperatures are or and exceeded in transportation facilities, which is in violation of water quality standards in the Clean Water Act. We applaud the decrease of use of trucks and anticipate discussions with the Corps and FPOM to continue to reach resolution on this topic.

B-4, 4.a.(2). NMFS suggested the following change. *“PIT-tagged fish will be sorted by code, to determine which fish are part of the transport study group and which are to be returned to the river. All non PIT-tagged fish will be returned to the river.”* It was our understanding that fish transportation would occur at McNary every other day so all of the bypassed fish would not have to go through sampling loop. Currently, McNary has the capability to identify PIT-Tagged fish as they travel through bypass pipe and do not have to enter the sampling loop to be detected.

### **Appendix C – Bonneville Power Administration’s System Load Shaping Guidelines to Enable Operating Turbines at Best Efficiency**

All turbines should be operated within their 1% efficiency range during the entire juvenile and adult salmon migrations. Deviations from the 1% efficiency should only occur under emergency conditions and not for power peaking/load following and non-emergency power production. These deviations and justifications should be recorded and reported to the fishery managers at the end of each migration season and should be included in the post-season report. A system to record and post operations outside of 1% should be created for review during the passage season.

### **Appendix G - Fish Sampling Protocols**

It is CRITFC’s understanding that a review of the current practices at the adult fish collection and monitoring facility is underway. Appendix G should be completed/updated in the next few weeks to allow FPOM the opportunity to provide a comprehensive review and comments specific to the facility.

The number of picketed leads lowered for adult guidance into adult fish collection facilities needs to be reviewed, especially if there are large numbers of migrating adults in the ladders. Operations should err on the side of caution. One option might be to start with a minimum number of picket leads (i.e. two). If sample numbers cannot be obtained during the sampling period then additional picketed leads should be utilized. FPOM should coordinate this operation and establish a criterion to determine when more picket leads should be lowered. These issues

should be incorporated into the FPP. What is the status of this criteria and how well did it work in 2002. For 2003 we may need to consider powerhouse operations to move fish from Powerhouse II to Powerhouse I.

The current FPP changes to adult handling procedures in elevated river temperatures are an improvement over past practices, but the FPP still specifies adult trapping and handling at 70 degrees F and above. The susceptibility of adults to bacteriophage diseases such as *furunculosis* and *columnaris* increases greatly at 68 degrees F (Bouck et al. 1975 in McCullough 1999). These diseases are readily transferred in water and from animal to animal. Egg viability is also compromised at these temperatures (McCullough 1999). CRITFC prefers that adults not be handled when temperatures in traps or fishways reach 68 degrees F. We recommend that at the least special operation should go into affect at 68 deg. F not wait until 70. Furthermore no sampling above 72 degree F should be allowed at all. And sampling from 70 – 72 should not occur unless special situations require it and has approval by FPOM and the section 10 permit.

In 2001, NMFS limited adult handling in the Priest Rapids Dam trap to 69 degrees F in a ESA Section 10 incidental take permit. There should be a consistent temperature criterion for handling adults throughout the river, not exceeding 69 degrees F and preferably not exceeding 68 degrees F., the current water quality standard.

CRITFC is uncertain if high temperatures and handling stress can be mitigated by holding anesthetized adults in lower temperatures and then releasing them into higher temperatures in the ladders. We are concerned with the possibility of inducing a thermal shock with no way of determining the effects. Further, CRITFC has concerns with the temperature differentials between several tanks to which adults may be subjected. It remains a critical uncertainty as to whether or not the Corps' proposed 3 degree F change is appropriate for adult health. We continue to recommend that a literature review of this practice be completed to see if there is scientific information to support this procedure. Until this review is completed, we cannot support the proposed action.

We need to address the problems of salvage related to lamprey in the adult ladders. With a loss of about 1200 adult lamprey at John Day, new guidelines or some better procedures must be implemented. Lamprey are significant culture resource for the CRITFC's member tribes and they are greatly concerned over the loss of hundreds of adult lamprey at John Day during the November, 2002 dewatering. Criteria to insure that lamprey are not again lost must be developed in coordination with the tribes and other fishery managers and included in the FPP.

### *Conclusion*

The 2001 fish passage season occurred during extremely low flow conditions caused by federal operator power operations and low runoff. Fish passage facility operations during such conditions caused increased direct and delayed mortality. Given the present drought conditions, 2003 has the potential to cause similar or even greater losses since many more juvenile salmon than in 2001 are projected to migrate through the Corps dams and reservoirs. We must insure that any facility operations and maintenance issues that arose due to the low flows are addressed before the 2003 migration season begins.

CRITFC appreciates the opportunity to comment on the Corps' draft 2003 Fish Passage Plan. We have made many recommendations that we anticipate the Corps can incorporate into the final 2003 FPP. We stress that time is of the essence to resolve many of these passage issues before the onset of the 2003 migration season. We look forward to working closely with the Corps staff in developing the final 2003 FPP. Should you have technical questions regarding these comments please contact Tom Lorz, Fisheries Engineer or Bob Heinith, Hydro Program Coordinator at (503) 238-0667.

Sincerely,

Don Sampson  
Executive Director

Cc: Commissioners  
Tribal program managers  
Steven Wright, BPA  
J. William McDonald, Reclamation  
Robert Lohn, NOAA Fisheries  
Lt. Col. Edward Curtis, Corps Walla Walla District  
Col. Richard Hobernicht  
Witt Anderson, Corps NWD  
Lynda Walker, Corps NWD  
FPOM

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## Attachment 6

### 2003 Fish Facility Mitigation Projects

- 1) Bonneville Dam. Automated Chain gates at Bonneville Powerhouse I sluiceway. This would allow for improved operation and better compliance with sluiceway criteria. The sluiceway has been shown to be a passage route for both juveniles and kelts; insuring that the sluiceway stays in criteria assures better access and utilization of this passage route.
- 2) Bonneville Powerhouse Two. Adult fishway trash rake system. Currently the rack and the rakes are not properly meshed, thus trash raking does not work well. The fishway units have to shut down to allow debris to float off. This problem has been ongoing for several years. In the past, during the adult passage season, debris build-up in the diffusers led to a failure of the system, and the ladder was forced to operate with only the emergency auxiliary water-supply system for nearly a month and fishway criteria was not met. Purchase of a proper rake system that meshes well with the rack will help to reduce the debris problem and should halt the operation of having to turn off the fish units at night to remove the debris. This on/off operation can lead to premature failure of the units and can possibly affect night passage of adults.
- 3) John Day Dam- North shore fishway pump. The fishway pump is currently unable to provide entrance criteria for both north shore adult entrances due to a potential constriction in the hydraulic conduit. Funds could be used to determine a remedy for this situation.
- 4) John Day Dam- Full Flow PIT-Tag detection on the juvenile transport flume. Currently, adults that fallback over the dam can spend extended periods of time in the juvenile system since there is no way to move them from the channel. Several hundred adults are removed each time the system is dewatered. This dewatering is stressful to adults and has led to mortality. A full flow PIT-Tag detection system would allow for operation of the juvenile facility so that adults would not hold in the dewatering section of the transport flume. Further, juvenile stress would be reduced since the dewatering structure would not need to be operated.
- 5) McNary Dam juvenile screen system outfall. Concern has been raised about increased avian predation in conjunction with the outfall. Methods for reducing predation should be designed, implemented and evaluated for effectiveness.
- 6) Bonneville Dam. Bradford Island adult ladder repair and modernization. Currently the Bradford Island ladder is the oldest in the Columbia River Basin and renovation and repairs are underway. Increased funding would assure that the work would be expedited. This ladder system passes a significant portion of all of the Basin's returning adults, thus, expedient repairs are critical.

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**02 April 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. WMP Update, Finalization of the Spring/Summer Update, Action Agencies
3. Transport Data, IDFG
4. Spill Starting on Snake River
  - [Results of the Corps Q-Adjust Runs](#). (17kB)  (COE).
  - [Sensitivity of water supply to flow in the Lower Snake River](#). (22kB)  (COE).
5. Review current system conditions.
  - Fish migration status (NMFS, USFWS)
  - Chum (ODFW, WDFG)
  - Vernita Bar
  - [Reservoir operation, power system, water supply](#). (16kB)  (COE, BOR, BPA)
6. Review operations [requests #2003-4](#). (256kB)  (COE).
7. Develop recommended operations.
8. Other.
  - Set agenda for next meeting.

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**COLUMBIA RIVER REGIONAL FORUM**

**TECHNICAL MANAGEMENT TEAM  
MEETING NOTES**

**April 2, 2003**

**CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE  
PORTLAND, OREGON**

**FACILITATOR’S SUMMARY NOTES ON FUTURE ACTIONS**

Facilitator: Donna Silverberg

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

**Vernita Bar Update:**

Chris Carlson, Grant County PUD, reported that operations are currently under the flow bands. April 25 is the expected date for end of emergence based on expected temperatures in the river (warmer temperatures earlier). Chris will continue to update TMT on Vernita Bar.

**ACTION:** Chris will provide a spreadsheet of end of emergence dates from past years and other data for TMT, which will be posted on the TMT web site.

**Water Management Plan Update:**

Scott Boyd reported that the next draft WMP will include the April final forecast. NOAA and the COE will discuss research (what information and how to incorporate it), spill volumes, and transport as they relate to the WMP.

**ACTION:** Paul Wagner will provide a one-page summary of research that is being conducted at each project that might impact operations this Spring/Summer.

Ron Boyce suggested that the spill table be included in the Spring/Summer update for easy reference.

**Spill Start in the Snake River:**

As requested, Cindy Henriksen provided a handout of the Q-Adjust results for the March and mid-April water supply forecasts and a sensitivity analysis chart. Concerns were raised about what factors should be considered in making decisions about initiating spill in the Snake River. There are differences in perspectives on regulated vs. unregulated and volume needed to fill reservoirs.

**SOR 2003-5:**

Dave Wills presented the SOR on behalf of the Salmon Managers. Because there is a very large run expected, especially of wild fish, the request is to begin Snake River spill on April 3 as described in the Biological Opinion and implement MOP operations (MOP +1) at Lower Granite to coincide with the start of spill.

**NOTE:** CRITFC would like to see a MOP operation. The Salmon Managers requested a MOP +1 operation at Lower Granite to be consistent with last year's RSW test. There will be further discussion of this issue as it relates to the RSW "non-test" days at the next TMT meeting.

Paul Wagner presented data on flows, fish numbers and transport vs. in-river survival numbers for previous years. Based on current information, the Salmon Managers felt that the SOR provides a "spread the risk" operation. Action agencies felt that the data is inconclusive to show that in-river passage would have a greater benefit than transport. The COE is concerned with the low in-river flows and water supply uncertainties. All agreed that this is a unique, "on the cusp" situation. There were also questions raised around financial effects. As a result, the issue was elevated to IT.

**Question for IT:** Is 85 kcfs a threshold/absolute on-off for spill? If not, what methodology should be used to determine when to begin spill?

Will the RSW test at Lower Granite be conducted if there is no spill, and for how long?

**UPDATE:** IT discussed the uniqueness of the year and very large out-migration numbers, flows "on the cusp" of the 85 kcfs BiOp. target, and data that may support the importance of in-river migration to boost survival rates early in the season. Given the data and discussions, IT agreed to implement spill according to criteria in the Fish Passage Plan and as specified in the SOR. TMT will revisit the issue on April 9 and consider the discussions from IT, the April final forecast and concerns raised at the last TMT meeting.

The RSW test question was also resolved at the IT meeting – COE and its contractors will conduct a forty day test.

**Current System Conditions:**

*Fish status:* Ron Boyce reported to the group that 15,000 Spring Chinook have been observed below Bonneville. High numbers of chum were observed last week – Oregon expressed appreciation for the Action Agencies' operation of the tailwater at Bonneville for chum. Dave Wills reported 35,000 observed chum at Hamilton Creek. An official end of emergence date will be shared with the group at the next TMT meeting.

*Reservoir/Power system/Water supply:* Libby is at elevation 2404' and continuing to draft. Hungry Horse is at 3509' and Grand Coulee is at 1283.7'. There will be 35 kaf out of Cascade from April 5-27. Dworshak is at 1581' and releasing 9600 kcfs. The Dworshak final shows an increase in inflows, with a potential April 10 elevation of 1535'.

The Dalles April early bird water supply forecast for Jan-Jul is 83.1 MAF (77% average); Grand Coulee Jan-Jul is 52.4 MAF (83%); and Lower Granite Apr-Jul is 16.9 MAF (78%).

*Other:* Flow for hatchery release was altered slightly due to transformer complications at Spring Creek. The COE communicated with USFWS on this, and met the minimum request.

**SOR 2003-4:**

A request was made to operate Dworshak to the highest elevation possible, while not exceeding 110% TDG, and to provide stable flows throughout the Spring. The COE will balance flood

control needs at Grand Coulee with the interests expressed in the SOR. The Action Agency plans to release 15 kcfs starting 4/3. TMT will revisit this issue at the next TMT meeting.

**Next Meeting, April 9:**

Agenda Items:

- Grand Coulee Shaping
- Update from IT
- Lower Granite RSW Operations
- Beginning of Lower River Spill

## **Meeting Minutes**

### ***1. Greeting and Introductions***

The April 2 Technical Management Team meeting was chaired by Cindy Henriksen of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3945.

### ***2. Water Management Plan Update, Finalization of Spring/Summer Update.***

Scott Boyd said the spring/summer update will be finalized as soon as the April final forecast is received; he said he has not made any additional changes to the document since the last TMT meeting. Paul Wagner said he is continuing to discuss his research addendum to the WMP with the Corps and other action agencies; we're also discussing some other issues, such as spill volumes at various projects, which NMFS would like to see included, he said. There is a meeting tomorrow with our co-managers to discuss those spill volumes, Wagner said; there is also a transport issue we need to come to closure on before the 2003 WMP is finalized.

The group devoted a few minutes of discussion to what, exactly, Wagner would like to see added to the 2003 WMP; there was some disagreement over what it is appropriate to include in the annual WMP with respect to research. How to incorporate that information, and where, is the crux of the ongoing discussion, Henriksen noted. We think next year's operational plan is the logical home for the research addendum, Scott Bettin said. A few minor comments on the spring/summer update were offered at today's meeting; it was agreed to discuss this issue further at the next TMT meeting.

### ***3. IDFG Transport Data.***

It was agreed to address this topic at a future TMT meeting.

### ***4. Start of Spill on the Snake River.***

Henriksen reminded the group that, at the last TMT meeting, the Corps had been asked to develop an additional Q-Adjust run, shaping the current water supply forecast volume 59 different ways (based on the 59 runoff shapes in the historic record) to get a sense of what operations could be like in this particular water year. The new Q-Adjust run, dated March 24, was based on the March mid-month water supply forecast, she added. Henriksen noted that, according to the 2000 FCRPS BiOp, spill would be initiated at the Lower Snake projects only if seasonal average flows at Lower Granite are forecast to exceed 85 Kcfs.

She referred the group's attention to a document titled "Q Adjust Results, March Final vs. March Mid-Month" (available via hot-link from the TMT website), then spent a few minutes going through its contents. The bottom line, Henriksen said, is that based on the March final forecast (dated March 18), Q-Adjust tells us that the seasonal average flow at Lower Granite would be 71 Kcfs, approximately 10 Kcfs less than the water supply needed to initiate spill at the Lower Snake projects, based on the sliding scale the Corps uses to calculate the seasonal average flow. In the March 18 Q-Adjust run, the seasonal flow objective was met in none of the 59 water years modeled, Henriksen added. We then ran Q-Adjust using the March mid-month forecast, Henriksen said; this forecast showed an increase in projected runoff volume. In this March 24 run, April-June Lower Granite flows averaged 79 Kcfs, and the seasonal flow objectives were met in 4 out of the 59 years modeled.

Henriksen said the Corps had also run a sensitivity analysis on the Q-Adjust runs for March 18, March 24 and February 28. The group devoted a few minutes of discussion to what, exactly, this shows, as well as the question of whether the BiOp's Lower Snake spill trigger should be based on regulated or unregulated flows at Lower Granite. Bettin noted that the system is operated based on regulated flows; therefore, it makes sense to base the spill trigger decision on regulated flows. Wagner replied that, according to the historic record, an April-July Lower Granite runoff volume of 17 MAF will result in an unregulated seasonal average flow of 85 Kcfs at that project; we're very close to that volume in your current forecast, he said. Henriksen replied that some volume will also be needed to fill Dworshak from its April 30 flood control elevation -- about 400 KAF or 200 Ksf. That's at the heart of the debate over whether to use regulated or unregulated flows, Bettin said.

Wagner noted that the BiOp also provides for in-season adaptive management as new information comes to light; at our last meeting, he said, we heard from John Williams about the relative survival benefits of in-river migration vs. transportation. What I heard was that those relative benefits were a push, Bettin said. For some species, and at some periods during the migration season, Wagner replied -- for wild Snake River spring chinook, early in the season, in-river migration appears to provide a greater benefit than transportation.

The discussion returned to the Corps' sensitivity analysis; Henriksen noted that the River Forecast Center's March 24 STP run, initialized on current reservoir elevations and the most recent 10-day forecast, resulted in a 19.1 MAF April-July runoff volume and a seasonal average flow of 88.8 Kcfs at Lower Granite. However, the April early-bird water supply forecast at Lower Granite is 16.9 MAF, she said; the bottom line is that we are very close to the volume needed to trigger spill at the Lower Snake projects -- about 80 Kcfs as a seasonal average regulated flow at Lower Granite. Again, if we use the monthly time step computer models to

calculate projected regulated flow, the threshold we need to achieve to trigger spill is 81.2 Kcfs at Lower Granite, based on the Corps' sliding scale, she added.

Any sense of how the April final forecast will shake out, given the fact that it is snowing like crazy here in Lewiston at the moment? IDFG's Steve Pettit asked. I expect the April final to be at or above the April early-bird levels, Kyle Martin replied; CRITFC's longer-term forecast is for slightly above-average precipitation east of the Cascades during the month of April.

It all comes down to how literally you interpret the forecast data, said Wagner. The language in the BiOp is extremely literal, said Bettin – a seasonal average flow of 85 Kcfs at Lower Granite is an on-off switch. Here we are, right on the cusp, and the question is, what do we do? Silverberg said. I suggest we take it up during the discussion of the SORs (Agenda Item 6, below), Henriksen replied.

Henriksen also went briefly through the outputs from the April 1 STP model run, which shows expected regulated flow at Lower Granite, Priest Rapids, Bonneville and McNary. Based on this most recent run, the forecast unregulated volume at Lower Granite during the April-July period was 17.2 MAF, yielding an average regulated flow for the April 3-June 20 period of 82.6 Kcfs.

##### ***5. Current System Conditions.***

Grant County PUD's Chris Carlson said he had developed an end-of-emergence estimate for this year's Hanford Reach fall chinook; based on the most recent water temperature data and projections, which include warmer-than-usual water temperatures for this time of year, the projected end of Hanford Reach fall chinook emergence is April 25. Carlson said the Hanford Reach fish protection operation started on February 28 this year; the Priest Rapids flow fluctuations bands are the same as they were in 2002: 20 Kcfs when Priest Rapids flows are in the 36 Kcfs-80 Kcfs range; 30 Kcfs when they are in the 81 Kcfs-100 Kcfs range, 40 Kcfs when they are in the 101 Kcfs-130 Kcfs range, 50 Kcfs when they are in the 131 Kcfs-170 Kcfs range and a 150 Kcfs hourly minimum when Priest Rapids flows exceed 170 Kcfs.

What does end of emergence mean operationally? Henriksen asked. At the end of emergence, Grant County PUD can go down to 36 Kcfs at Priest Rapids, our license minimum, Carlson replied. Will you re-evaluate the projected end-of-emergence date as more temperature unit data come in through the season? Henriksen asked. I'll provide an update at the next TMT meeting, Carlson replied, adding that he will email a summary of this year's Hanford Reach fish protection operation to Henriksen for posting to the TMT website.

The flow bands are absolute, or, say, 20 Kcfs +/-? Ron Boyce asked. We're trying to operate within the absolute 20 Kcfs/30 Kcfs/40 Kcfs/50 Kcfs flow band, Carlson replied. And how does the projected end of emergence date of April 25 compare to previous years? Boyce asked. Last year it was also April 25, Carlson replied; in 2001 it was May 10, in 2000, May 2. However, it has been as late as June 22 in recent years, he added. In response to another question, Carlson said his end of emergence calculation is based on the current and projected temperature regime in the river, as well as the end of fall chinook spawning, which occurred around Thanksgiving this year.

The status of the 2003 juvenile outmigration was covered under Agenda Item 6, below. Boyce added that more than 15,000 adult spring chinook passed Bonneville yesterday, which compares to a 10-year average of about 2,000 adults for this date. Overall, the run has been excellent so far this year.

With respect to chum, Boyce drew the group's attention to the Ives Island index seining information from the Fish Passage Center homepage; chum seining numbers are on the rise, and things are looking good, he said – emergence is right on track for this time of year. Wills said that large numbers of chum are also emerging from the Hamilton Springs/Hardy Creek spawning areas; emergence has likely just peaked from those systems. In response to a request from Bettin, Boyce said he will provide an updated end-of-emergence estimate at the April 16 TMT meeting.

Moving on to current system conditions, Henriksen said Libby is releasing 4 Kcfs today and is drafting slightly. Libby's current elevation of 2404 feet is well below its March 31 flood control elevation. Reclamation's Tony Norris said the current elevation at Hungry Horse is 3509.8 feet; the project has filled a foot in the past five days.

Henriksen reported that the April early-bird water supply forecast at Lower Granite is 16.9 MAF, 78% of average. At Dworshak, project elevation was 1581.2 this morning, 19 feet from full. Inflows to the project are about 15 Kcfs; Dworshak is releasing 9.6 Kcfs, which is full powerhouse capacity. Henriksen noted that the Corps has completed its April final water supply forecast for Dworshak; it shows an increase from 1.8 MAF to 2.4 MAF. When we re-calculate the April 30 flood control elevation at Dworshak, it is expected to be about 1535 feet, she added. Henriksen added that the April early-bird forecast at The Dalles is 83.1 MAF, 77% of average; at Grand Coulee, it is 52.4 MAF, 83% of average.

Norris said Grand Coulee was at elevation 1283.7 as of this morning. He added that 35 KAF of Cascade Reservoir storage, agreed to in last year's NMFS/Idaho deal, will begin heading down the Snake River at a rate of 1,000 cfs per day on April 5. The Cascade release will continue through April 27.

Bettin said the power system continues to operate smoothly. Henriksen added that there had been a power rejection due to a transformer problem at Dworshak on March 19, which meant it was only possible to release 4 Kcfs from Dworshak on the first night of the operation requested in SOR 2003-3; the problem was fixed in time to release the requested volume in support of the hatchery release on March 20.

## ***6. New System Operational Requests.***

On March 26, the action agencies received SOR 2003-4. This SOR, supported by USFWS, NMFS, IDFG, ODFW, the Nez Perce Tribe, the Shoshone-Bannock Tribe, WDFW and CRITFC, requests the following specific operations:

- Operate Dworshak Reservoir to the highest elevation possible. Given the below-average runoff volume, to the maximum extent possible, fill above local flood control elevation to save water for the spring juvenile salmonid outmigration. Utilize available space in other reservoirs to meet system flood control requirements.

Wills spent a few minutes going through the justification of this SOR, the full text of which is available via the TMT's Internet homepage. Please refer to this document for the full details of this SOR.

Henriksen noted that, given the revised water supply forecast at Dworshak, the Corps plans to increase project outflow to 15 Kcfs tomorrow, with the goal of running right up to the 110% Idaho TDG standard. That will give us more flow in April, consistent with the salmon managers' desire to shift as much Dworshak outflow into the early April period as possible, she said. We plan to continue to release 15 Kcfs from Dworshak through at least the end of April, she said; however, it will not be possible to draft the project to elevation 1535 feet by April 30. We may have to increase Dworshak outflow further later in April to avoid filling too much, even if that means exceeding the 110% TDG level, she said; that is at least a possibility. We will continue to revisit this operation as we go through the month, Henriksen added. Obviously the shape of the runoff in the Dworshak Basin will be very important this year, Wills said; any guesses as to whether or not the runoff will be early this year? Right now there's no way to know, Henriksen replied.

How, then, does this impact SOR 2003-4? Silverberg asked. Obviously we're hearing some new flow and water supply forecast numbers for Dworshak at today's meeting, Wills said; I'm not sure how much flexibility we have, operationally, at this point, but our overall goal is a smooth Dworshak operation headed toward June 30 refill at that project, rather than an operation that results in a severe pinch on Dworshak outflow in June while the project is refilling. So while the SOR's requested operation may not be explicitly met, its overall intent will be met? Silverberg asked. Sounds as though it will, Wills replied.

Henriksen added that Grand Coulee operations are being managed to produce a smoothly increasing flow at Priest Rapids through April. As we approach April 10, we'll need to have some conversations about what the salmon managers want to do, with respect to the Grand Coulee/Priest Rapids operation, Norris said -- for example, if you ask us to go to the 135 Kcfs BiOp flow right away on April 10, that's going to impact the volume of water available from Grand Coulee later in the season. We'll talk about that at FPAC and come prepared to discuss it at the next TMT meeting, said Wills.

On April 1, the action agencies received SOR 2003-5. This SOR, supported by USFWS, NMFS, IDFG, ODFW, WDFW the Nez Perce Tribe and CRITFC, requests the following specific operations:

- Implement spill at Lower Granite Dam as described in the 2000 Biological Opinion. Begin spill at Lower Granite Dam at 6 p.m. on April 3, 2003. Spill will then be phased in at the downriver projects at two-day intervals, initiating spill at

- Little Goose on April 5, at Lower Monumental on April 7 and at Ice Harbor Dam on April 9. This two-day implementation interval may be modified pending collection of juvenile passage information at these downriver passage sites.
- Implement MOP operations beginning at Lower Granite pool at MOP+1 on April 3 to coincide with the initiation of spill. MOP operations are then to be implemented sequentially at Little Goose on April 4, at Lower Monumental on April 5 and at Ice Harbor on April 6.

Wills went through the justification for this SOR, the full text of which, again, is hot-linked to the TMT website. Please refer to this document for full details of this SOR.

With respect to the current status of the smolt outmigration, Wills said the cumulative passage index for yearling chinook at Lower Granite is now 12,000 fish, more than double the average index numbers for the past five years. We've got steady, large numbers passing Lower Granite, indicating that we have large numbers of fish moving down through the system at this time, Wills said. In response to a question from Bettin, Pettit said IDFG expects more than twice as many wild spring chinook outmigrants in 2003 compared to 2002. These fish are the progeny of the huge 2001 Snake River chinook spawning year, expected to produce as many as 800,000 wild spring/summer chinook outmigrants.

Trap catches of wild fish have also been very high for this time of year, Boyce noted. The bottom line is that we think this is going to be a huge outmigration, and we're already seeing large numbers of outmigrating juveniles throughout the Snake River basin, he said. At this point in the season at Lower Granite in 2002, we had collected just over 3,000 yearling chinook, added Dave Hurson; this year, to date, we have collected more than 16,000, despite the fact that Lower Granite flows are lower than they were last year. Kyle Martin said for the record that CRITFC would prefer to see the Lower Snake projects operated at MOP, rather than MOP+1, in order to move the Snake River outmigrants down to the estuary as soon as possible.

Henriksen noted that the current flow at Lower Granite is in the 60 Kcfs-65 Kcfs range, and is expected to be about that level for the foreseeable future. Given that fact, and the fact that the BiOp specifies 85 Kcfs as the flow target that provides optimal in-river migratory conditions, she said, it's hard to see the logic of putting fish in the river at this point.

As we heard at the last TMT meeting, said Wagner, there does appear to be more benefit to leaving early-season migrants in the river than there is from transporting those fish. I'll admit that the differential SARs were not dramatic, Wagner said, but the data does show some benefit to in-river migration early in the season. Hurson replied that not everyone in the reason agrees with NOAA Fisheries' analysis of the in-river vs. transport survival data; much of that data shows that early-season transport is more beneficial than in-river migration for wild steelhead, for example. There is a wealth of other transport and adult recruitment data dating back 30 years that shows no demonstrable benefit from transportation, Boyce observed – that's why ODFW advocates spreading the risk. Our interpretation of all of this data is that it is better to leave as many fish as possible in the river while temperatures are cool and migratory conditions are good, he said. And it

should be pointed out that not everyone in the region shares the salmon managers' interpretation of those data, Henriksen said – we would really like to see a clear correlation between in-river flow and survival.

Basically what I'm hearing is that the survival data is a push, said Bettin – there may be a slight survival benefit to spilling and leaving the fish in the river, and there may be a slight benefit to transportation, depending on date, species and river conditions. Wills replied that the 85 Kcfs flow target is a seasonal average; the BiOp did not anticipate that flows at Lower Granite would be 85 Kcfs through the entire spring period. The group also discussed the cost differential between spill and transportation, with Boyce observing that the cost of spill is a policy, rather than a technical, issue, more appropriately addressed by the Implementation Team.

Silverberg suggested a short caucus break to allow the TMT participants to discuss ways to resolve this issue. When the discussion resumed, the group reviewed historic flow data showing average flows in the Lower Snake during the early April period. In 2000, flows at Lower Granite were right where we are now, about 60 Kcfs, on this date; in 2000, flows were in the 80 Kcfs range on this date. In both years, Lower Snake flows quickly increased through the first week of April until they exceeded 80 Kcfs. Henriksen noted that, in 2000, spill did not begin at the Lower Snake projects until April 10, when total flow at Lower Granite was 80 Kcfs. It's the fact that conditions are so different, between the 60 Kcfs we're seeing currently and the 80 Kcfs we saw in 2000, that gives us some concern, Henriksen said. However, the trigger for starting spill, in those previous years, was the status of the juvenile outmigration, said Margaret Filardo; as we've heard, we do have substantial numbers of juvenile migrants moving down through the Snake River system. The group also revisited the transport vs. in-river SAR data for the 2000 wild spring/summer chinook.

Ultimately, it was agreed to elevate this issue for resolution at tomorrow's IT meeting. The issue was framed as follows:

Is a seasonal average flow of 85 Kcfs at Lower Granite a threshold/absolute on-off switch for initiating spill at the Lower Snake projects? If not, what methodology should be used to determine when to begin spill? Also, at what river flow level should transportation be turned on? Also, given current water supply forecast information, should the spring 2003 RSW evaluation at Lower Granite be a 20-day or a 40-day test?

It was agreed to ask the IT to resolve this issue at its April 3 meeting. Bettin said he will draft a paragraph laying out the action agencies' concerns about SOR 2003-5.

With respect to the MOP operations included in SOR 2003-5, the action agencies agreed to implement the requested operation as written. And is the MOP+1 operation at Lower Granite only during the RSW test period, or the full season? Rudd Turner asked. We'll have to get back to you on that, Wagner replied. Also, do you want to operate the RSW on non-test days while spill is occurring at Lower Granite? Bettin asked. We'll talk about that at FPAC and have an answer for you next Wednesday, Boyce replied.

## ***7. Recommended Operations.***

Henriksen said Dworshak outflow will increase to 15 Kcfs tomorrow, up to the 110% TDG cap downstream. Libby will remain at minimum outflow for the foreseeable future; Ice Harbor will start spilling at 6 p.m. on April 9, with the exact spill volume to be determined in the next few days. At its meeting tomorrow, the IT will decide whether spill will begin at the other Lower Snake projects. If they decide in the affirmative, spill will begin tomorrow night at Lower Granite. Hungry Horse is releasing powerhouse minimum flow, Norris added.

#### ***8. Other.***

There is an issue with the floating bulkhead at Little Goose Dam, said Don Faulkner of the Corps; it cannot be removed at the current pool elevation, and is currently tied up to the navigation guide wall. Project personnel would like to fill Little Goose pool for one day, starting tomorrow, in order to get that bulkhead removed, he said. It will likely take two days to empty the pool once it's full, Bettin said, noting that increased outflow from Dworshak beginning tomorrow should mean no net impact to Lower Snake flows.

#### ***9. Next TMT Meeting Date.***

The next meeting of the Technical Management Team was set for 9 a.m. Wednesday, April 9; the purpose of this meeting will be to discuss Grand Coulee/Priest Rapids operations after April 10, as well as the IT's response to the Lower Snake spill operation. The next face-to-face TMT meeting was set for April 16. Meeting summary prepared by Jeff Kuechle.

**QADJ RESULTS (MARCH FINAL VERSUS MID-MONTH)**

Run Assumptions:

Both runs:

- \* Grand Coulee operates to meet 70 kcfs at Priest Rapids Feb - Apr 30. Coulee attempts to meet McNary flows of 220 kcfs in May to draft limit of El. 1260, and targets El. 1288, 1285, 1280, and 1278 in June, July, Aug 15, and Aug 30. .
- \* Hungry Horse operates to VARQ, meets flows at Columbia Falls, targets full in June, El. 3550 in July and 3540 by 31 Aug.
- \* Brownlee operates to flood control elevations.

MAR 18 Run additional assumptions:

- \* Streamflows were adjusted to the **March Final** Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were actual Feb 28th ending elevations
- \* Dworshak meets flood control, targets full in June, releases 14 kcfs cfs in Jul - Aug for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on minimum flow (4000 cfs) or VARQ flood control March - June. Targets El. 2454 in July with minimum flow of 6000 cfs, targets El. 2449, and 2439 on Aug 15 and Aug 30.

MAR 24 Run additional assumptions:

- \* Streamflows were adjusted to the **March Mid-Month** Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were forecasted 31 March ending elevations
- \* Dworshak releases 15 kcfs in April, targets full in June, releases 14 kcfs in Jul - Aug for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on minimum flow (4 kcfs) or VARQ flood control Mar - Apr, **conducts a sturgeon pulse operation** in May - Jun, targets El. 2454 in July with minimum bull trout flow of 7 kcfs, targets El. 2449, and 2439 on Aug 15 and Aug 30.

Results:

**LOWER GRANITE:**

QADJ Targets based on the March Final Lower Granite WSF of 14.6 MAF were 85 kcfs from 3 Apr - 20 Jun and 50 kcfs from 21 June - 31 Aug.

QADJ Targets based on the March Mid-Month L. Granite WSF of 16.6 MAF were 87.3 kcfs from 3 Apr - 20 Jun and 50.3 kcfs from 21 June - 31 Aug.

	Average Flows in kcfs			No. Times Meeting Targets	
	QADJ Target	MAR 18 RUN	MAR 24 RUN	MAR 18 RUN	MAR 24 RUN
APR1	85 / 87.3	47	63	1	3
APR2	85 / 87.3	59	74	4	13
MAY	85 / 87.3	84	87	29	31
JUN	73.3 / 74.9	74	81	30	37
JUL	50 / 50.3	40	42	4	7
AUG1	50 / 50.3	35	37	0	0
AUG2	50 / 50.3	22	25	0	0
<b>APR1-JUN</b>	<b>81.2 / 83.2</b>	<b>71</b>	<b>79</b>	<b>0</b>	<b>4</b>

**SEASONAL SPRING FLOWS**

\* Lower Granite flow targets for the Apr - Jun period averaged 81.2 kcfs with the March Final and averaged 83.2 kcfs with the Mid-Month.

\* These flows were calculated by averaging 81 days (1 Apr - 20 Jun) at 85 kcfs (or 87.3 kcfs) and 10 days (21 - 30 Jun) at 50 kcfs (or 50.3 kcfs).

\* In the MAR 18 RUN, the QADJ Apr-Jun Lower Granite flows averaged **71 kcfs** and the objectives were not met in any of the 60 years modeled.

\* In the MAR 24 RUN, the QADJ Apr-Jun Lower Granite flows averaged **79 kcfs** and the seasonal flow objectives were met in 4 of the 60 years.

**PRIEST RAPIDS:**

	Average Flows in kcfs			No. Times Meeting Targets	
	QADJ Target	MAR 18 RUN	MAR 24 RUN	MAR 18 RUN	MAR 24 RUN
AP1	70	74	80	59	59
APR	135	84	97	1	5
MAY	135	139	158	43	58
JUN	135	102	121	2	55

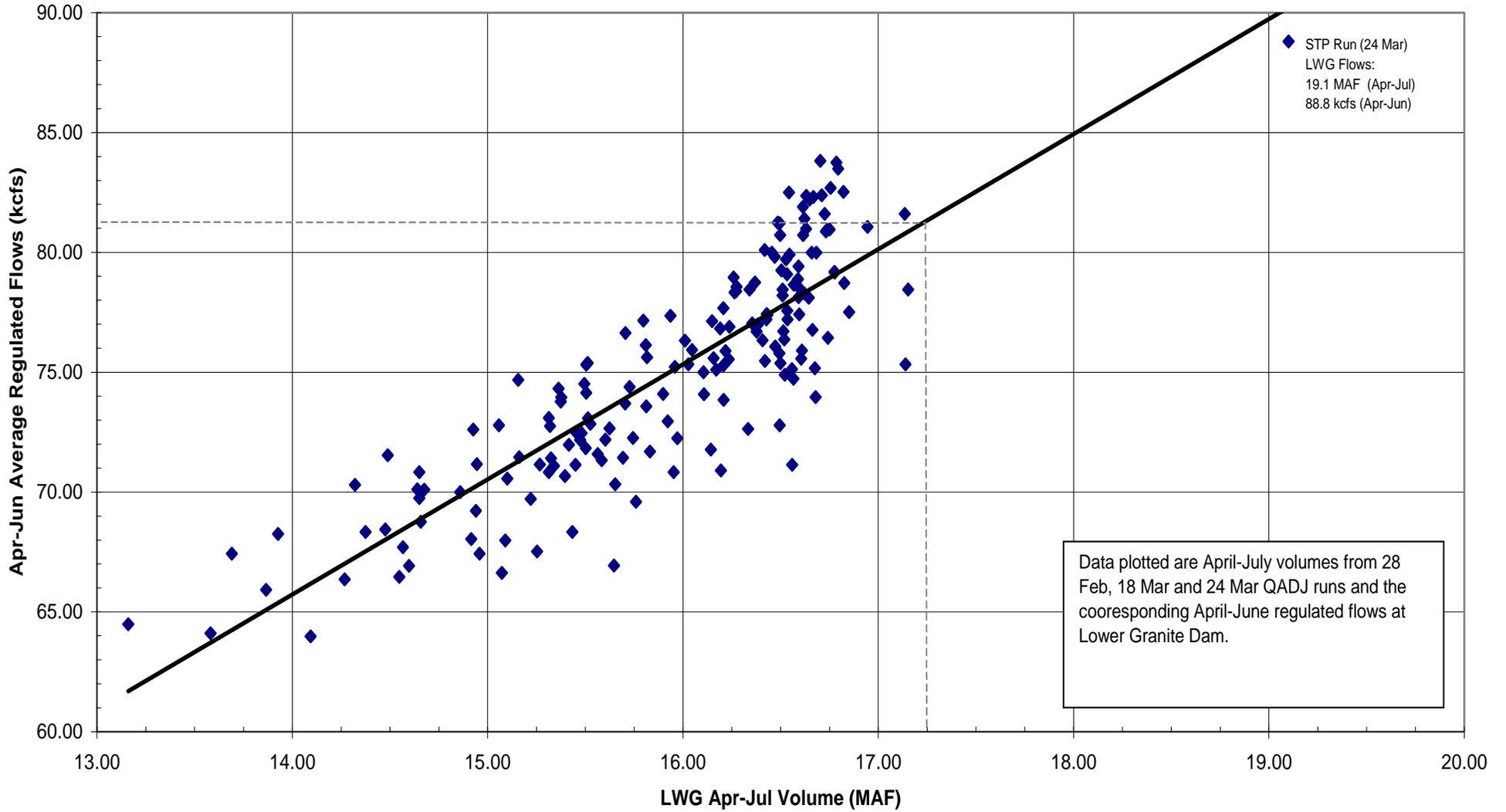
**McNARY:**

	Average Flows in kcfs			No. Times Meeting Targets	
	QADJ Target	MAR 18 RUN	MAR 24 RUN	MAR 18 RUN	MAR 24 RUN
APR2	220	138	163	0	3
MAY	220	212	227	28	46
JUN	220	172	219	4	28
JUL	200	138	154	0	1
AUG1	200	128	137	0	0
AUG2	200	105	113	0	0

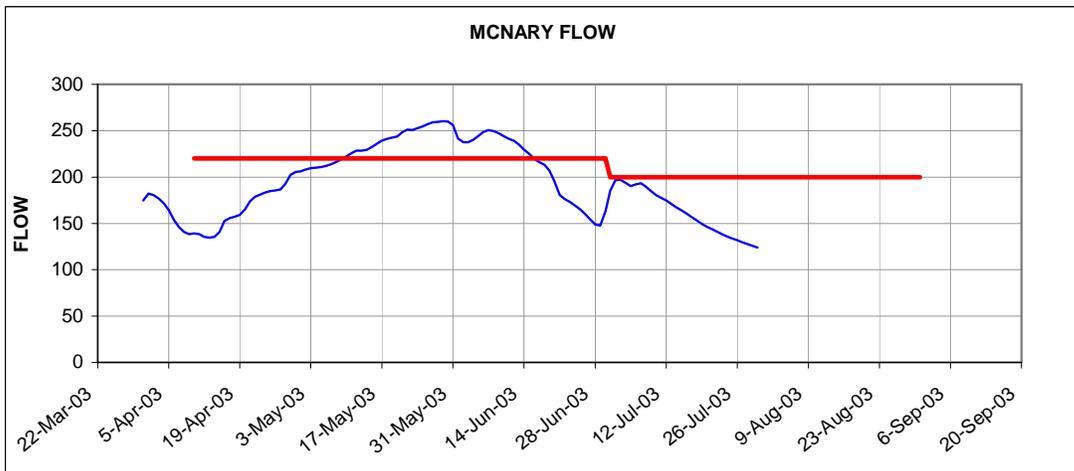
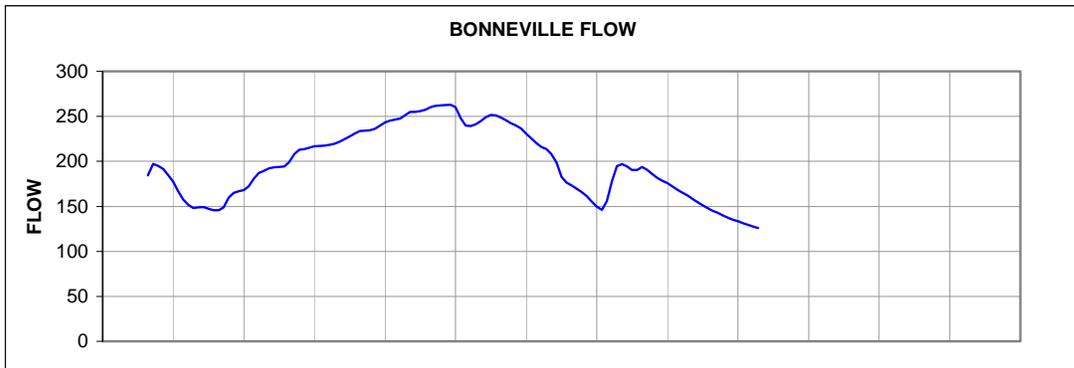
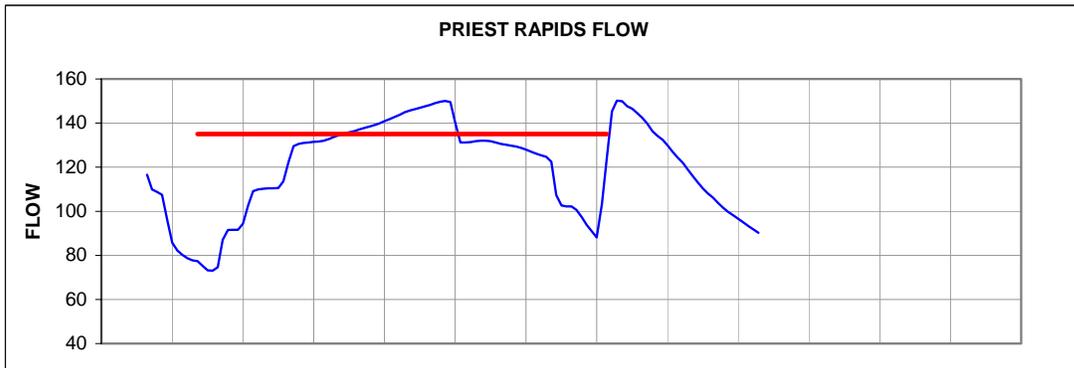
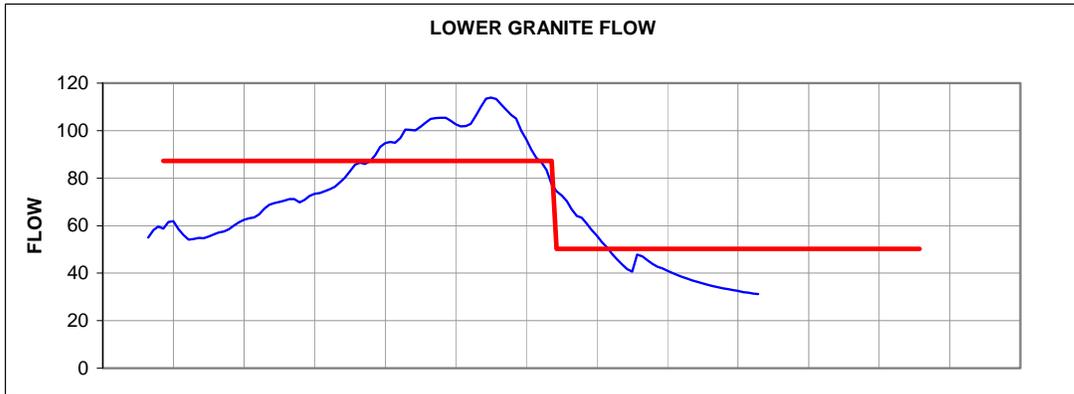
**REFILL:**

	30 June Elevation			No. Times Meeting Targets	
	QADJ Target	MAR 18 RUN	MAR 24 RUN	MAR 18 RUN	MAR 24 RUN
Libby	2459	2457.0	2456.2	31	29
Hungry Horse	3560	3555.4	3560.0	2	59
Grand Coulee	1288	1288.0	1288.0	59	59
Dworshak	1600	1599.9	1600.0	58	59

# Sensitivity Analysis LWG Volume versus Regulated Flow



# FLOWS FROM 1 APR 2003 STP MODEL RUN



# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**02 April 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## ISSUE FROM TMT TO IT

**April 2, 2003**

1. QUESTION: Is 85 kcfs projected seasonal flow at Lower Granite the threshold to initiate spill at the three lower Snake collector projects?
2. If the answer to this question is no, then the TMT requests guidance as to the criteria that should be used to determine the duration and timing of spill at these projects.

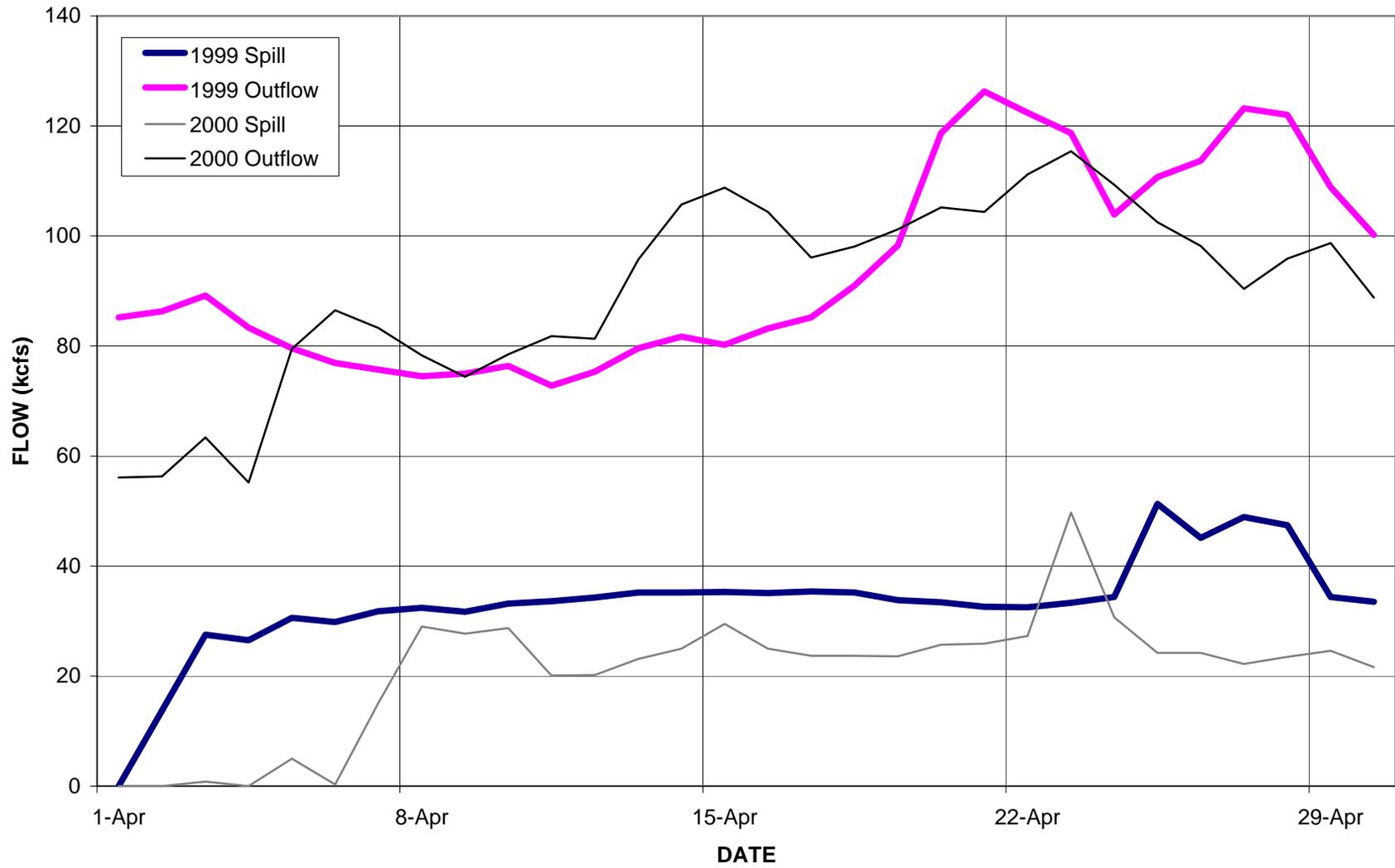
## BACKGROUND and DISCUSSION

1. SOR 2003-5 REVISED ([attached](#)) requests spill at the three Lower Snake River collector projects. The TMT question has been posed in 2003 because of the water conditions. The projected seasonal flow at Lower Granite is very near 85 kcfs. The Corps' April 1, STP model output showed an April through July runoff of 17.2 MAF and the resultant flow from April 3 through June 20 is 82.3 kcfs. In past years the water supply forecast at Lower Granite and the resultant projected seasonal flow was clearly above or below 85 kcfs.
2. At TMT the discussion about 2003 included projected seasonal flow in conjunction with current flow in the lower Snake River at Lower Granite. The Corps' sensitivity analysis shows a correlation of water supply forecast at Lower Granite to the projected seasonal flow ([attached](#)).
3. The NOAA Fisheries Science Center data comparing transport and in-river [SARS](#) in 1999 and 2000 were revisited. This information was put together with the flow at Lower Granite in those years, and compared to the current flow in 2003. ([attached](#)).
4. Given the Science Center data along with current flow near 60 kcfs, and expected flow in the lower Snake River, the concern is that the existing in-river conditions may not be the most hospitable for fish.

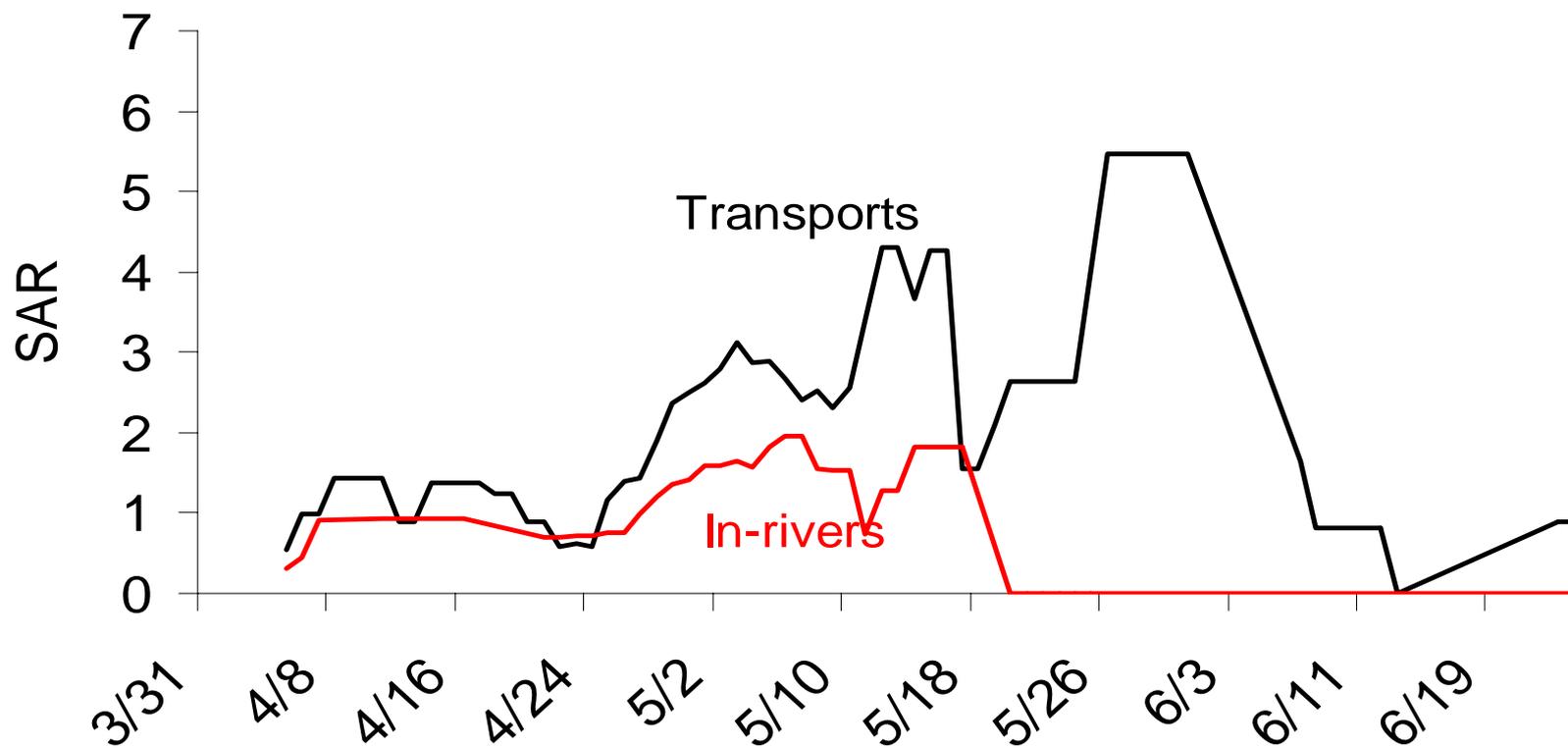
5. For questions and comments call Cindy Henriksen at (503) 808-3945

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

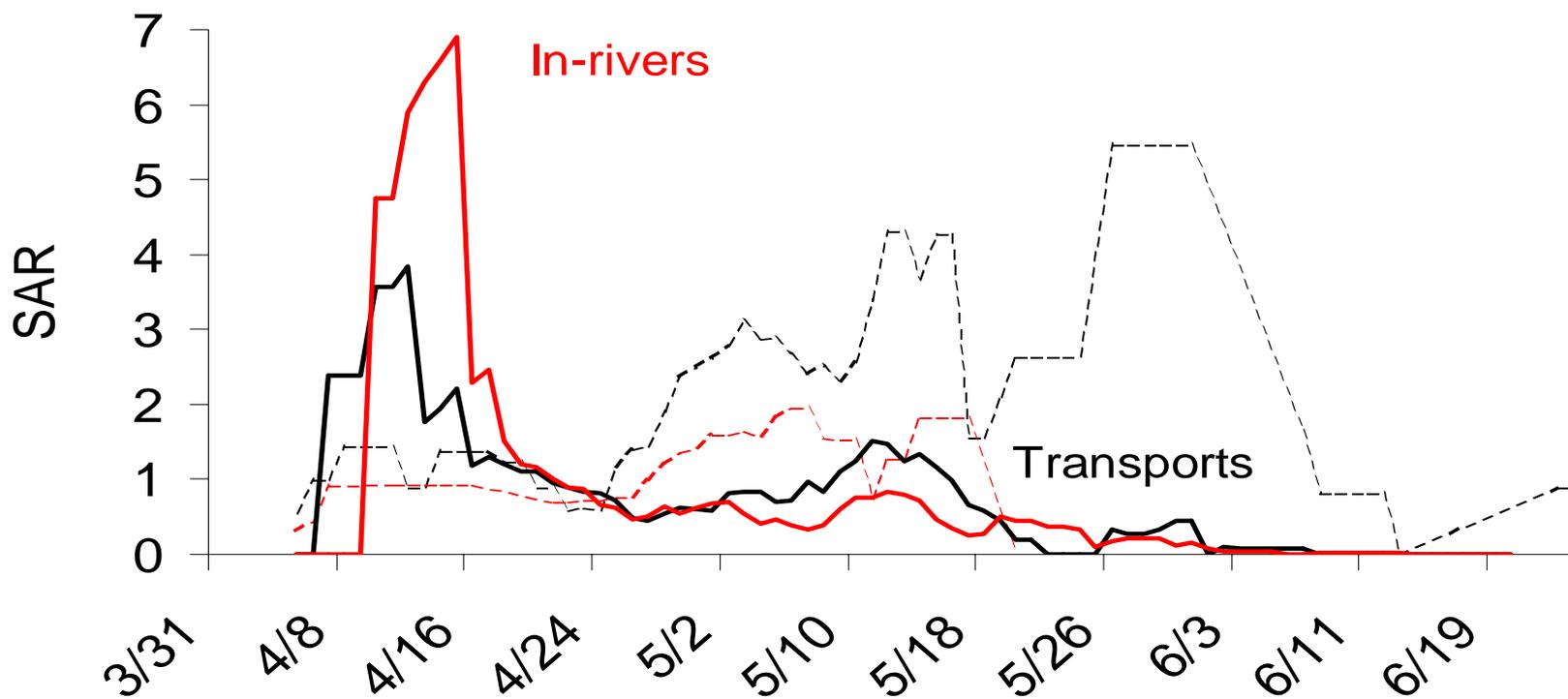
# LOWER GRANITE



# 1999 Wild Sp/Su Chinook Salmon



# 2000 Wild Sp/Su Chinook Salmon



# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

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**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**09 April 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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## AGENDA

1. Welcome and introductions.
2. Towboat Association [Request for Snake River Operations](#).
3. WMP Update, Finalization of the Spring / Summer Update, Action Agencies.
4. Grand Coulee Flow Shaping in April, Salmon Managers, All
5. Update from IT.
6. Lower Granite RSW Operations.
7. Beginning of Lower River Spill.
8. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - chum (ODFW, WDFG)
  - Vernita Bar
  - [reservoir operation](#), power system, water supply (COE, BOR, BPA)
9. Review operations request [SOR 2003-6](#) (137kB) .
10. Develop recommended operations.
11. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**TECHNICAL MANAGEMENT TEAM  
MEETING NOTES  
April 9, 2003  
CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE  
PORTLAND, OREGON**

FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Donna Silverberg

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

**Towboat Association Request for Snake River Operations:**

Cindy Henriksen, COE, reported on discussions with the Towboat Association over the Snake operations that began last week. From the COE's perspective, there needs to be a balance between safe navigation and ESA requirements. Larry Johnson, Chair of the Towboat Association, described some of the navigation problems that have occurred for the tug and tow boats at the Snake River dams. The Association would like to see the pools operated to allow fourteen feet of water for safe navigation, even with the lighter loads the boats have been carrying. He provided a handout that proposed operations for each of the Snake River projects.

A survey taken last year shows Lower Granite, the confluence of the Snake and Columbia Rivers, Lower Monumental and Ice Harbor as problem areas. The COE would like to do further research on these and other areas in collaboration with the Towboat Association and the Coast Guard. TMT was supportive of this collaborative effort and suggested that they work quickly to allow a balance of safety for navigation and fish.

**ACTION:** The COE, Coast Guard, and Towboat Association will work together to gather data for presentation at the next TMT meeting, April 16. The data should include field observations, and a database query of the TBA's over-winter and current information regarding problems at the MOP level. TMT members asked that the focus be narrowed down to the critical problem areas. In the interim, operations will remain as follows:

- Lower Granite – MOP+1
- Little Goose – MOP+1
- Lower Monumental – MOP
- Ice Harbor – MOP+1

CRITFC will comment on this issue at the next TMT meeting, after having internal policy discussions.

**Water Management Plan Update:**

Scott Boyd, COE, will provide a draft WMP Spring/Summer Update at the next TMT meeting.

**Grand Coulee Flow Shaping in April:**

The COE provided Q Adjust information to help inform Salmon Manager decisions particularly for the month of April. The query was “How much will Grand Coulee draft and when will refill occur?” According to the model runs, Grand Coulee did refill most times. The Salmon Managers will look at the information that was provided and comment at the next TMT meeting.

#### **Update from IT:**

Cindy Henriksen reported on the results of the IT meeting at which IT members discussed SOR 2003-5, elevated from TMT. As a result of that discussion, spill began last week. TMT was asked to re-examine the water supply forecast and other conditions today and decide whether or not to continue to spill. NOAA Fisheries will be developing criteria that includes fish/biological needs, river levels, temperature and other factors to be considered in years (such as this) that are so close to Biological Opinion target numbers.

#### **Vernita Bar:**

Chris Carlson, Grant County PUD, reported on March 31-April 6 operations at Priest Rapids. April 3 was the only day that operations outside the band width occurred; the PUD is looking into the reason for this. CRITFC requested that flows be smoothed out as much as possible. Samples taken over that week showed 18 live Chinook and 19 mortalities in a 2964 sq. foot area. April 25 is the projected date for the end of emergence.

**ACTION:** Cindy Henriksen will work with Chris to post this information on the TMT web page.

#### **Lower Granite RSW Operations:**

The COE reported that there will be a forty-six day test beginning April 14 at Lower Granite. The test will be included in the WMP Spring/Summer update. There will be an update on why the RSW test program has changed since last year at the next TMT meeting.

#### **SOR 2003-6/ Beginning of Lower River Spill:**

SOR 2003-6, from the Salmon Managers, requests Lower Columbia spill to start on April 14 to the 120% spill cap to support the passage of juveniles. The spill program will go as follows:

- **McNary:** Spill will begin at 6pm on April 14, up to the gas cap, for 12 hours. Power house will be the constraint.
- **John Day:** There will be a spill test on April 10 of 30% from 7am – 5pm. Spill will begin again on April 14 at 6pm.
- **The Dalles:** Spill will begin at 6pm on April 14 at 40% of flow. A spill test will also begin sometime around April 14 so some fluctuations in flow may occur. There will be follow-up discussions of this at the next TMT meeting.
- **Bonneville:** 75 kcfs of spill will begin at 5am for twelve hours for two days, then two days at the gas cap, to accommodate an adult fallback study.

#### **Snake River Spill:**

STP forecasts show April 3-June 20 at 17.75 MAF and 86.4 kcfs. The Q Adjust model shows 80 kcfs. The forecasts are still “on the cusp” of BiOp. target numbers at Lower Granite. Spill will continue and TMT will continue to monitor and revisit the issue next week. NOAA is looking to frame up criteria for TMT on this issue and should have something by next week.

### **Current Conditions:**

*Fish migration:* Record numbers of adults and yearling Chinook have been observed. The highest number of seined chum was 302 at Ive's Island on April 1; high numbers were also seen at Hamilton Creek. Ron Boyce and Shane Scott will set up a seining field trip sometime before May.

*Water supply forecast:* The April final forecast is out. The Jan-July forecast at Grand Coulee is 52.9 MAF (84% of normal); Lower Granite is 17.1 MAF (79%); The Dalles is 72.4 MAF (78%); and Libby is 4.95 MAF (79%) – which would allow for a sturgeon flow operation. Hungry Horse is discharging at a power house minimum and is at elevation 3511.2'. Grand Coulee is at elevation 1284.3'. The Dworshak April-July water supply forecast shows a 2.32 MAF increase from earlier forecasts. The COE is closely monitoring the snow pack density level. Cindy Henriksen will gather further information on this and share it with TMT.

### **Lake Roosevelt Forum:**

The April 23 TMT meeting will be held in Spokane at the Lake Roosevelt Forum conference, from 10am-2pm, with an hour lunch break in-between. TMT members will have an opportunity to attend a meeting from 9-10am with the Transboundary Gas Group.

### **Next Meeting, April 16:**

Agenda Items:

- Grand Coulee Shaping
- MOP Operations in the Snake – Towboat Association, COE
- Columbia Falls/Priest Rapids SOR
- Current Conditions
- RSW Lower Granite Test Design – Update
- Other

### ***1. Greeting and Introductions***

The April 9, 2003 Technical Management Team meeting was chaired by Cindy Henriksen of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3945.

### ***2. Towboat Association Request for Snake River Operations.***

Henriksen said the Corps had received a letter from the Columbia River Towboat Association (CRTA) regarding operations in the Lower Snake River navigation channel. Henriksen noted that minimum operating pool (MOP) operations began last week at the four Lower Snake projects, as requested by the salmon managers; various industry representatives attended today's meeting to explain the navigation problems this operation is causing them. They would like to work with TMT to find a solution that is both fish-friendly and safe for navigation, Henriksen said.

Larry Johnson of the Towboat Association spent a few minutes going through the letter,

noting that the towboats need 14 feet of water to navigate safely. The specific operational request contained in the letter is for MOP+2 at Ice Harbor, Lower Monumental and Little Goose, and MOP+3 at Lower Granite. This is what we think we need to ensure 14 feet of depth in the navigation channel, he explained. The CRTA letter is available via hotlink from today's agenda on the TMT homepage; please refer to this document for full details and justification.

Johnson noted that the Association's biggest fear is the possibility that a tow loaded with diesel or other fuel could run aground, causing a potentially catastrophic spill. The health and safety of the crews is of course another major concern; we don't want to find out the hard way where those safe pool levels really lie, he said.

How did you determine these requested pool elevations? Ron Boyce asked. Are those just your best estimates of the pool elevations needed to provide 14 feet of depth through these channels? That's correct, Johnson replied – it's based on the in-river experiences of our tow boat captains under various pool operational regimes. He added that it is the Association's hope that the Corps and/or the Coast Guard will conduct a detailed survey of navigation channel bathymetry soon. Carl Knaack said the Corps' Walla Walla District generally conducts this survey in July; the results will be available in August.

Paul Wagner observed that Little Goose and Lower Monumental were operated at MOP+1 last year; the TMT, at least, heard no reports of navigational problems. Has something changed? he asked. The river is changing all of the time, Henriksen replied; the Snake River is fairly volatile. And dredging has not occurred recently? Ron Boyce asked. There is a lawsuit against the Corps dredging program in the Lower Snake, Wagner replied; NMFS is re-consulting on its dredging BiOp at the court's direction. In response to a question, Johnson said the Association has been light-loading its barges for the past year.

Based on the Corps' July survey last year, how many areas were found that were 14 feet or less, and does your data comport with the Association's request? Wagner asked. The request covers more areas than were included in our surveys last year, Knaack replied. The letter includes a number of areas that were not identified in our current dredge plan, he said; however, there are definitely some places both the Corps and the Association have identified as problems, such as the area around Buoy 58A at the Lower Monumental Dam entrance.

It was noted that operation of McNary Pool between elevations 337 and 340 improves conditions in the problem site identified in the first bullet (the entrance of the Snake River up to the Ice Harbor cut), although this operation was not requested in the CRTA letter. Is it fair to say that Ice Harbor and Little Goose pools are the two most critical areas? Boyce asked. Johnson replied in the affirmative. Boyce said that, given the fact that the salmon managers would like to maintain the lowest possible pool elevations for fish passage and research, some additional research to identify the lowest possible safe navigation elevations would be useful. Wagner added that the need to maintain Lower Granite pool at MOP+1 to provide consistent hydrological conditions during the RSW test (the RSW test runs through May 28) makes the request for MOP+3 at Lower Granite unlikely to be implemented.

Wagner went briefly through the reasons the salmon managers want to see MOP+1 at this

time of year: essentially, because there is approximately a 7% improvement in water velocity and travel time through the Lower Snake pools at MOP+1 vs. full pool. The group offered a few clarifying questions and comments regarding annual bathymetric changes to the channel, as well as to the Association's current and historic barge loading practices.

Boyce reiterated his request that the Association provide more detailed information about the bare-bones navigational minimum in terms of the operation of the Lower Snake pools. Henriksen said the Corps, Towboat Association, and Coast Guard will work cooperatively and get out on the river as soon as possible and survey the problem sites to see what pool elevation is necessary to provide safe navigation conditions.

In the interim, it was agreed to operate the Lower Snake pools in a manner similar to the way they were operated last spring, which provided acceptable navigational conditions. Henriksen said she will work with Walla Walla District and the CRTA to put together a comprehensive list of trouble spots and grounding incidents and as much Corps/CRTA/Coast Guard field survey information as possible in time for discussion at next week's TMT meeting.

Henriksen summarized the operation by saying that, beginning today, and for the next week, at least, the pools will be raised to levels similar to those implemented in 2002: MOP+1 at Lower Granite, Little Goose and Ice Harbor, MOP at Lower Monumental. No TMT objections were raised to this operation, although Kyle Martin said he will need to run this operation by CRITFC's policy personnel before agreeing.

### ***3. WMP Update – Finalization of Spring/Summer Update.***

Scott Boyd reported that the April final water supply forecast is now available, so based on the decisions the TMT makes today, it should be possible to finalize the spring/summer update by next week. It was agreed to discuss this topic again at next week's TMT meeting.

### ***4. Grand Coulee Flow Shaping in April.***

Wagner said that, at the salmon managers' request, the Corps had done a Q-Adjust run on this issue; the question that run was intended to answer is, what is the likelihood of meeting the seasonal average flow target of 135 Kcfs at Priest Rapids beginning in mid-April, and maintaining that operation through June. If that Priest Rapids flow target can be met, what would be the impact on Grand Coulee elevation and refill probability? he said. This is part of the Corps' ongoing efforts to balance system operations among all river uses, Henriksen explained; we want to start homing in on expectations across the entire season.

We took the April final Water Supply Forecast and shaped it 59 different ways, according to the 59-year historic water record, she continued; we initialized the run beginning on April 15. We used 135 Kcfs as the target at Priest Rapids flow for the entire operating period to test whether Grand Coulee might refill under that operation, Henriksen explained. The bottom line is that, under this modeling scenario, Grand Coulee would refill 53 times out of the 59 years while meeting the 135 Kcfs seasonal average flow target at Priest Rapids; the average Priest Rapids flow in April, according to Q-Adjust, is 136 Kcfs; in May, 145 Kcfs. Average flow in June is 151

Kcfs, not 100 Kcfs as shown in this version of the handout.

So what needs to happen with this today? Silverberg asked. As we go through the season, assuming TMT meets every other week, we will be setting operations that will run for the next two weeks, Henriksen replied; today's operation would run through April 21, she said. We want everyone to have a common understanding of what the expected operation is. So this indicates that it should be possible to meet the Priest Rapids seasonal average flow of 135 Kcfs this spring and still refill Grand Coulee? Boyce asked. Correct, Henriksen replied. The salmon managers will likely be developing an SOR specifying that operation in time for submission next week, Boyce said.

On a related topic, Martin said Bob Heinith has observed that flows through the Hanford Reach have been fluctuating significantly over the past several weeks, in some cases exceeding the flow bands agreed to under the Hanford Reach Fish Protection operation. Bob would like to request that the project operators do everything they can to minimize flow fluctuations from Grand Coulee and Priest Rapids, said Martin, given the fact that there are significant numbers of juveniles moving through the Hanford Reach at this time. In response to a question, Scott Bettin said there were a total of 38 strandings reported at the Hanford Reach monitoring sites last week.

With respect to the fish protection operation, Chris Carlson reported that, for the period of March 31-April 6, day-average discharge from Priest Rapids was 110 Kcfs on March 31 (40 Kcfs flow band), 99.7 Kcfs on April 1 (40 Kcfs band), 95.9 Kcfs on April 2 (30 Kcfs flow band), 99.5 Kcfs on April 3 (30 Kcfs flow band); 105.6 Kcfs on April 4 (30 Kcfs flow band) and 73 Kcfs on April 5-6 (20 Kcfs flow band). Operations exceeded the flow band on April 3; Grant County PUD is investigating why that occurred.

Are there any limitations on how much flows can increase? Henriksen asked. Those calculations are based on Rock Island discharge, Carlson replied; the only restriction has to do with the boat basin elevation at that project. The group devoted a few minutes of discussion to the nuances of the fish protection operation.

Martin reiterated Heinith's flow fluctuation concerns; Carlson replied that Grant County PUD is certainly trying to minimize those flow fluctuations within the many operational constraints that have been imposed.

With respect to stranding, said Carlson, also during the week of March 31-April 6, Paul Hoffarth looked at 18 sample areas; he found 37 stranded chinook, 19 of which were mortalities. In response to a request, Henriksen said she will work with Carlson to ensure that future Hanford Reach fish protection and stranding reports are available via the TMT homepage prior to the meeting. In response to another question, Carlson said it still appears April 25 will be the end of emergence.

## ***5. IT Update.***

Henriksen reminded the group about the Lower Snake spill and forecast issue elevated to IT last week, regarding SOR 2003-5. At last Thursday's IT meeting, we were using a Q-Adjust

run based on the March mid-month forecast, Henriksen said; that forecast resulted in Lower Granite flow very close to the 85 Kcfs seasonal average flow at Lower Granite. The IT recommended that the action agencies implement spill at the Lower Snake projects as requested in the SOR, Henriksen said based on the mid-month forecast; they also directed the TMT to revisit the forecast information at today's meeting, as well as developing criteria to lay out when spill should stop at the Lower Snake projects in the future, if the forecast deteriorates. The April early-bird forecast is larger than the March mid-month forecast that was used to make the decision to begin spill, so the seasonal average flow is expected to be somewhat larger than it was when we made the decision to start spill, said Henriksen. The bottom line, however, is that spill has now begun at the Lower Snake projects, Henriksen said.

#### ***6. Lower Granite RSW Operations.***

Bettin said there is a new spill schedule available for Lower Granite; it now shows a 46-day RSW test beginning April 14 and running through May 28. The schedule will alternate between the RSW test condition (19 Kcfs total spill) and the BiOp spill condition (12 hours of spill up to the gas cap), in two-day randomized block designs. Rudd Turner added. In response to a request, Turner said he will post the new spill schedule to the TMT website, and it will also be included in the 2003 Water Management Plan. Chris Ross noted that the RSW operation (spill through the RSW plus one dog spill at each of the other spill bays) represents a change from the originally-requested operation; it was agreed that the TMT will discuss the reason for that change at its meeting next week.

#### ***7. Beginning of Lower River Spill.***

On April 8, the action agencies received SOR 2003-6. This SOR, developed and supported by USFWS, NOAA Fisheries, IDFG, ODFW, WDFW and CRITFC, requests the following specific operations:

- Beginning April 14, spill daily at the Lower Columbia River projects according to the 2000 Biological Opinion up to the 120% spill cap.
- At McNary Dam spill should occur between the hours of 6 p.m. and 6 a.m. and instantaneous volumes should be limited only by the gas cap.
- Spill daily at John Day Dam at 60% of instantaneous flow during nighttime hours at flows up to 300 Kcfs, and up to the 120% gas cap at flows greater than 300 Kcfs. Spill should occur from one hour before sunset to one hour after sunrise.
- Spill at The Dalles Dam shall occur for 24 hours daily at a level equal to 40% of instantaneous flow.
- Spill at Bonneville Dam shall be up to the 120% gas cap during nighttime hours, and 75 Kcfs or up to the gas cap during daytime hours for adult passage evaluation.

Wills spent a few minutes going through the justification and background for this SOR, the full text of which is available via hotlink from the TMT homepage. Please refer to this document for full details.

Wills noted that the principal driver for this request is the number of fish passing through

the John Day project and out of the Umatilla system. Henriksen and Bettin requested that the group go through the SOR to discuss the specific timing of the start of spill at each project. Bettin said the action agencies agree to implement spill up to the gas cap at McNary at 6 p.m. on April 14, noting, however, that it is unlikely that it will be possible to spill up to the gas cap at that project unless total river flow increases dramatically in the next five days, since McNary must have a minimum of 50 Kcfs running through the powerhouse. At John Day, Bettin said there is a spill test tomorrow beginning at 7 a.m. (one day only) during which the project will spill up to 30% of river flow for 12 hours. The regular John Day spill operation will be implemented as requested beginning April 14 at 1800 hours. There is a FFDRWG meeting today to discuss the 45% vs. 60% of total river flow question at that project today, Bettin added.

At The Dalles, spill will begin as requested on April 14 at 1800 hours; there will be a spill test beginning some time after April 14, looking at different spill patterns; however, the project operators will still be targeting 40% of day-average flow spill during the three-week test, Bettin said. At Bonneville, there is an adult fallback study going on; the researchers would like us to spill 75 Kcfs beginning at 5 a.m. on April 14, rather than 6 a.m., Bettin said – that will allow them to get in the full test block on that day. In response to a request, Boyd said he will include the most recent spill schedule at each project in the spring/summer update to the 2003 Water Management Plan.

So there is agreement to implement SOR 2003-6? Silverberg asked. That's correct, Bettin replied.

### ***8. Current System Conditions.***

With respect to the Snake River spill program, Henriksen said the most recent STP forecast (based on the April final Water Supply Forecast) shows an April-July runoff volume of 17.5 MAF and a seasonal average flow of 86.4 Kcfs at Lower Granite. However, she said, in the Q-Adjust run for the period April 15 through June 20, the threshold for the commencement of Lower Snake spill based on that monthly time-step model is 81.2 Kcfs at Lower Granite; the number in the most recent Q-Adjust run, based on the April final forecast, is 80.7 Kcfs. In other words, said Bettin, we're just under the threshold for Lower Snake spill, according to the Q-Adjust model.

The group devoted a few minutes of discussion to the differences between the STP and Q-Adjust model inputs and outputs; the bottom line is that we're really, really close to the threshold, Bettin said. We do plan to continue Lower Snake spill, at least for the time being, but we would like to continue to revisit this topic at future TMT meetings. We will also need to schedule some discussion of the spill start/stop criteria in years where the water supply is very close to the threshold, such as this one, Henriksen said; NOAA fisheries is going to provide that.

Moving on to fish passage information, Wagner drew the group's attention to the most recent adult passage reports. At Bonneville, said Boyce, a record number of adult spring chinook have already passed the project – over 40,000 through April 8, compared to a 10-year average of only about 2,000. We're seeing mostly very large 5-year-old fish, he said, noting that he had looked back over 30 years of historic passage records and had never seen this many fish this

early. The fisheries above I-5 have been shut down temporarily, he said; the current forecast of nearly 150,000 adult spring chinook is going to be revisited later this week. More than 7,500 fish passed Bonneville on April 6 alone, he added.

With respect to smolt data, Wagner said yearling chinook passage at Lower Granite has declined from the 14,000+ seen on April 4 to just under 4,000 smolts yesterday; numbers are still well ahead of the historic average indices for this date, however. River temperatures are running about 47 degrees F at Lower Granite, he added. Boyce also touched on Ives/Pierce Island chum emergence, noting that the highest number of chum seined – 302 – occurred on April 1 at Ives Island. Chum emergence timing and abundance are tracking past years, he said; there have also been a lot of juvenile chinook captured recently. Fish numbers are still looking good, as is Bonneville tailwater elevation, Boyce said. At Hamilton Springs and Hardy Creek, said Wills, numbers are still very high at Hamilton Springs and are starting to tail off at Hardy Creek, although the Hardy Creek trap tends to become less efficient at higher flows. Overall, said Boyce, the chum numbers for these systems are very large this year – it’s a good run.

Boyce added that he will be setting up a field trip to observe the Lower Columbia chum seining and trapping operations during the last week in April; he asked anyone interested in participating to contact him.

The group spent a few minutes perusing the year-to-date chinook and steelhead smolt index graphs for the Lower Snake projects. Based on this information, are you still comfortable that the outmigration is on track and spill should continue at the Lower Snake collector projects? Bettin asked. Yes, Wagner replied.

With respect to the water supply forecast, Henriksen reiterated that the River Forecast Center’s April final forecast was released yesterday. It shows the following:

- Grand Coulee (Jan-July): 52.9 MAF, 84% of average
- Lower Granite (April-July): 17.1 MAF, 79% of average
- The Dalles (April-Aug) 72.4 MAF, 78% of average
- Libby (April-Aug): 4.95 MAF, up from 4.1 MAF in the last forecast, 79% of average, which will allow for a Tier 1 2003 sturgeon flow operation of 800 KAF above minimum flow this year. Henriksen said Bob Hallock had requested some modeling runs looking at potential sturgeon operations; it now appears that the 2003 sturgeon “pulse” will consist of 18 days of higher flow (just under powerhouse capacity) from Libby beginning in late May. We will need to do some coordination as to how we operate Libby and Hungry Horse combined to avoid transmission system constraints, said Bettin; in general, more water is a good thing, but we don’t want to overload the lines.

Tony Norris reported that Hungry Horse is currently at elevation 3511.2 feet the project is filling about 2/10 of a foot per day. The project is releasing just over minimum powerhouse discharge because Columbia Falls flow is above the 3.372 minimum due to natural runoff, Norris said. He added that the current elevation at Grand Coulee is 1284.3 feet.

The April final water supply forecast at Dworshak is 2.32 MAF, April-July, 88% of

average, a dramatic increase, up from 1.8 MAF in the last forecast, Henriksen said. The project's April 30 flood control elevation is 1541.9 feet; the current Dworshak project elevation is 1577 currently, with 16 Kcfs outflow. We will continue to release that high flow for the foreseeable future, she said; we're watching the Dworshak snowpack very carefully. Current TDG levels below the project are 109%; we may need to increase outflow quickly and exceed the gas cap if the snowpack comes off quickly, Henriksen said. She noted that all headwater storage projects are expected to be at their flood control elevations by April 30; we're trying to release as much water as we can from Dworshak in order not to fill much above from elevation 1577 in April. She said the Dworshak-Grand Coulee shift will allow Dworshak to be a few feet above that elevation, but again, we're close to the snowpack density level that indicates that the snowpack is ready to come off, so we're watching that information very closely.

The Columbia Generating Station is up and running, but is going to come back down for refueling in May, Bettin said.

#### ***9. New System Operational Requests.***

This topic was covered under Agenda Item 7, above.

#### ***10 Recommended Operations.***

Recommended operations were covered during a previous agenda item.

#### ***11. Next TMT Meeting Date.***

With respect to the Lake Roosevelt Forum, Shane Scott said the TMT is scheduled to meet at 10 a.m. Wednesday, April 23 at the Doubletree Hotel City Center in Spokane. The next meeting of the Technical Management Team was set for Wednesday, April 16 (a conference call). Meeting summary prepared by Jeff Kuechle.

**COLUMBIA**   
**TOWBOAT** **RIVER**  
**ASSOCIATION**  
1500 NE Irving St., Suite 540, Portland, OR 97232  
Telephone: 503-234-8551, Facsimile: 503-234-8555

The Columbia River Towboat Association consists of 10 member companies barging nearly 13 billion tons of cargo between Astoria, Oregon and Lewiston, Idaho annually. The tugs and barges involved in this service are unique and specifically sized and configured to economically and safely operate within the physical confines of the federally authorized 14-foot navigation channel connecting 26 ports along the Columbia and Snake River System.

The Snake River has not been dredged in over three years. As a result many reaches of the river have shoaled in creating an increasingly dangerous situation that impedes navigation. In the absence of maintenance to the navigation channel, Snake River pool levels have been managed at a level above MOP. This has allowed the barge companies to continue to operate. Operating at MOP reduces the depth of the navigation channel and in the absence of dredging will halt safe navigation.

- One of the most challenging and difficult portions of the Snake River to navigate begins at the entrance of the Snake River up through the Ice Harbor cut. Here you have numerous shoal areas that are exposed during MOP. This area has seen many groundings. The area between buoy “8” all the way to the lower lock entrance of Ice Harbor dam is bank to bank rock.

**Ice Harbor MOP @ 437ft. Recommendation is MOP + 2 feet.**

- The area between Snake River Miles 27 and 29, just below the Sheffler grain elevator is experiencing an increased amount of shoaling. The shoal areas are marked by red nun “28”.
- Just immediately above Sheffler, between the Walker grain elevator and the airstrip at Burr there is a shoal area marked by buoys “34” and “38”. This shoal area has expanded significantly over the past few years reducing the width of the navigable channel.
- Lower Monumental lower dam entrance beginning approximately at buoy “58A” all the way into the guide wall entrance. This area has seen several groundings in recent years at MOP+1.

**Lower Monumental MOP @537ft. Recommendation is MOP + 2 feet.**

- Beginning on lower McGuire Range up bound to the lower guide wall entrance of Little Goose has shoaled extensively.

### **Little Goose MOP @ 633ft. Recommendation is MOP +2 feet.**

- At the approach to the upper entrance of the locks beginning at buoy “2”, the shoal area has extended out from the beach.
- Schultz Bar has been an ongoing problem with extensive shoaling, this area located between buoys “29A” and “35” is navigated at “slow Bell” because of “bottom suction”.
- During MOP+1, the Almoda Grain elevator has difficulty loading and fleeting the barge due to a rock ledge just out from the loading facility. The areas immediately above and below the two elevator facilities located here has also seen increased shoaling making it difficult to turn the tows for spotting at the elevators.
- The entrance to the lower locks at Lower Granite all along what is known as Davis Bar has shoaled in extensively, this also is an area where the tug and tow has to “ slow bell” because of bottom suction.

### **Lower Granite MOP 733ft. Recommendation is MOP +3 feet**

- The area between river mile 137 and 138 known as Steptoe Lower Range on the south side of the river has shoaled in extensively reducing the navigable channel.
- The area covering the confluence of the Snake and Clearwater Rivers has been a problem area at mop+2. The whole area up to the Cargill Grain elevator has extensively shoaled in to the point where the tug and tows have difficulty making their approaches up bound threw the RR lift bridge in the Clearwater. A radical “S” turn is required on approach to the bridge to avoid foul ground.

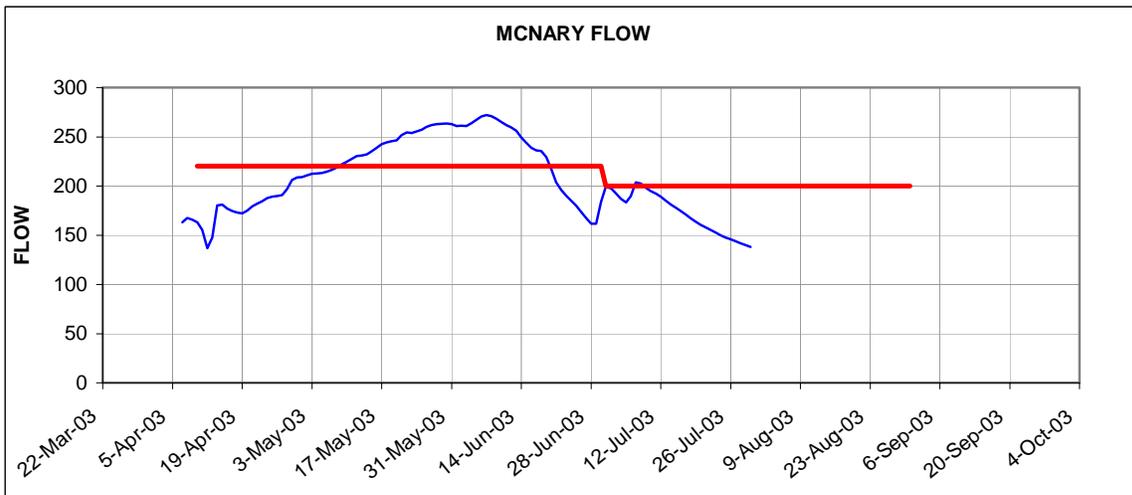
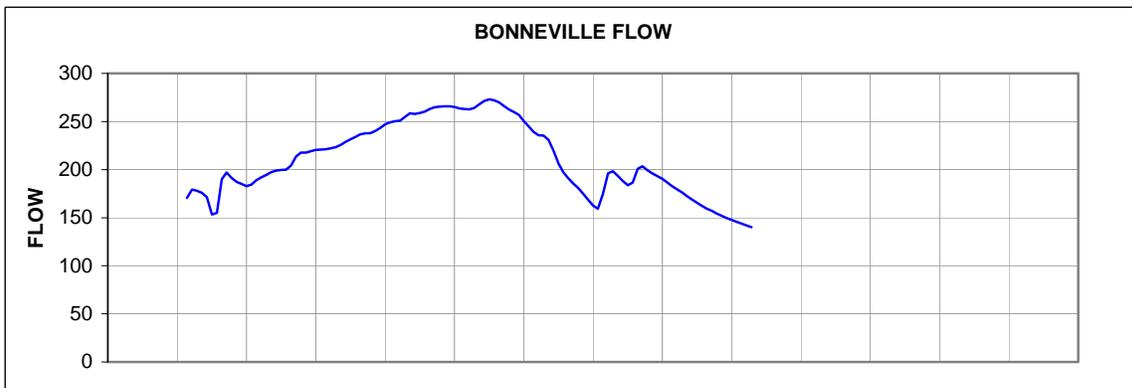
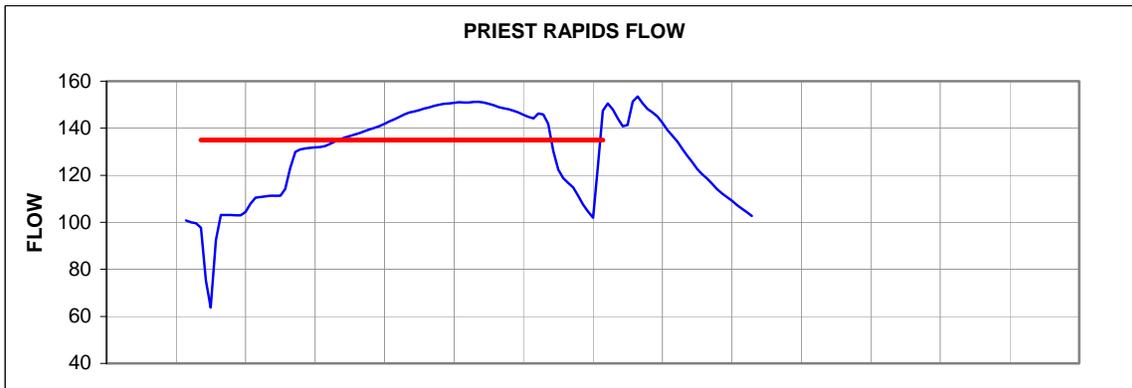
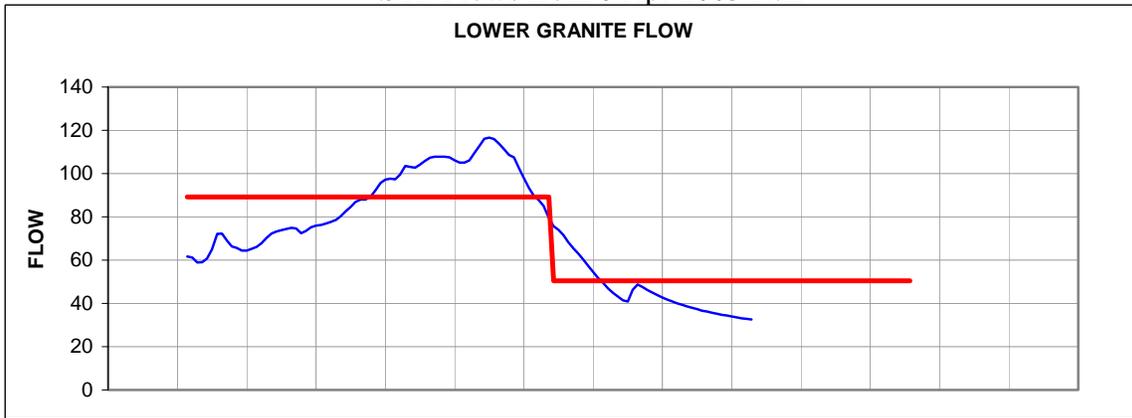
**Note: There are other contributing factors further exasperated by reductions in water depth.**

- **Lockages-** It is important to understand that with the MOP levels it makes it very difficult for the tug and tows to cross over the sills while entering and exiting the locks. This difficulty increases when the tug and tows are down bound with loads exiting the locks due to the effects of water displacement. It is important that the tugs pushing their loads gain enough speed to increase the water past their rudders to gain steerage. Without this speed through the water the tugs have no steering control. As the tug and tow exits the locks, water is trying to force its way back into the locks to displace the weight of the tow leaving. At MOP, with very little water over the sill, it becomes increasingly difficult to control the tow and takes an increased amount of time to gain the speed needed. Full power is applied to overcome these forces and like a rear wheel drive car quickly accelerating from a dead stop the rear of the car squat’s down. In the case of a vessel, the amount of squat will exceed one foot of draft.

- **Bank Suction/ Cushion-** A common river navigation phenomena affecting the handling characteristics of tugs and tows when operating in narrow channels is known as “bank suction”. Bank suction involves the tendency of a vessel to veer toward the bank as it displaces the water along the shore. The opposite affect, known as bank cushion is often encountered at slower speeds when the bow wave bounces off of the shore and back against the vessel. The effects of these phenomena are compounded the nearer the vessel is to the shoreline and varies with speed.
- **Bottom Suction-** This phenomenon is often encountered when there is very little underkeel clearance. As the vessel moves through the water it displaces the water ahead of it. In shallow water, this condition occurs when the water is displaced at a faster rate than the water that rushes in to replace it.
- **Trim-** When we speak of draft we assume that the vessel is trim. Trim is the difference in drafts between forward and aft. It is not uncommon to trim the barge down by the stern by a foot or more to make it handle better. This means that the depth of the stern is deeper than the bow.
- **List-** List is the angle of inclination of the vessel. Loading mechanisms for various bulk cargo are not precision guided. The result is that barges are often listing or leaning to one side by a foot or more. This means that the draft on one side of the vessel is greater than the other.
- **Sea Conditions-** Wave action causes vessels to bounce up and down and from side to side. Vessels become particularly lively the lighter they are loaded, but even loaded barges can bounce up and down a couple of feet.

All of these conditions contribute to the handling characteristics of tugs and barges. As a result, a reasonable margin of safety is required to insure the consistency and reliability of the system. Compensating for pool level reductions is much more complex than simply light loading a few barges. The safety and reliability of the entire system and by extension the integrity of the entire supply chain is already severely compromised as a result of not maintaining the navigation channel and approaches through annual dredging. The only thing that has enabled the CRTA member companies to continue to operate is through the management of adequate pool levels to enable us to navigate over, around and through otherwise unnavigable reaches of the river.

# STP Flows from 8 Apr 2003 Run



# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**16 April 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. Towboat Association and NWW Report on [Lower Snake Field Observations](#)
3. WMP Update, Finalization of the [Spring / Summer Update](#), Action Agencies
4. Grand Coulee Flow Shaping in April, Salmon Managers, All (QADJ results: [Case 1](#), [Case 2](#))
5. Fish Spill Status and Tracking, Laura Hamilton [[High 12hr Averages](#)] [[Exceedence Tracking](#)]
6. Lower Granite RSW operations.
7. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - chum (ODFW, WDFG)
  - Vernita Bar
  - [reservoir operation](#), power system, water supply (COE, BOR, BPA)
8. Review operations requests.
9. Develop recommended operations.
10. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**TECHNICAL MANAGEMENT TEAM  
MEETING NOTES  
April 16, 2003  
CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE  
PORTLAND, OREGON**

FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Donna Silverberg

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

**Vernita Bar:**

Chris Carlson, Grant County PUD, reported on Vernita Bar operations for the previous week. The end of emergence is expected to be April 26 or 27 due to temperature changes in the river. Fish monitoring is being done with WDFW; fish were found at seven sites. CRITFC officials reported seeing many dead fish on April 11. Oregon asked Grant County PUD to try to minimize flow fluctuations since there are record numbers of spawners. There will be a meeting to discuss Vernita Bar/Hanford Reach, hosted by the Grant County fish biologists, on May 1 at SeaTac. Anyone interested in learning more about this meeting should contact Joe Lukas. TMT members are welcome and encouraged to attend. Grant County PUD was encouraged to do the best it can to minimize flow fluctuations from Priest Rapids Dam.

**Towboat Association Report:**

The Coast Guard, Walla Walla COE and Columbia River Towboat Association (CRTA) visited seven locations in the river that the CRTA said were problematic for navigation. No problems were seen this year, but there may be navigation problems next year under a MOP +1 operation at Lower Granite. The CRTA soundings confirmed that in the absence of dredging, the river is shifting, silting in and reducing both in width and depth. The CRTBA recommendations are listed below:

- Conduct a complete survey of the bottom of the Snake River before next year.
- Operate at MOP +1 (same operations as last year) while completing the survey for next year.
- Dredge the river.
- Spill at Lower Granite until the barge leaves the lock.

The Walla Walla COE reported that there is a bottom survey scheduled for August. Chris Ross reported that NOAA will re-enter consultation with the COE on the possibility of dredging in Fall/Winter '03. CRITFC would be opposed to any operation outside of MOP/ MOP+1. For '03 Oregon would like to stay as close to BiOp. operating requirements as possible, and would like to see additional data as it is available.

The CRTA also reported that there was a navigation problem due to the spill pattern at John Day earlier in the morning.

**ACTION:** The COE will check into the possibility of going to a flat pattern at John Day. Cindy Henriksen will work with the Portland District COE and the CRTA to find possible solutions to the reported problem. Any changes to BiOp. spill will be coordinated with the Salmon Managers. In the interim, a towboat captain will call ahead if there is an issue and work with the operators to safely navigate the towboats. Information will be shared with the TMT via email.

**Water Management Plan Update:**

Scott Boyd, COE, reported that additional information from NOAA and BPA on research has been added to the Spring/Summer update. An update was made that flood control is based on the April (not March) final forecast. There will be a further update on the Update at the May 7 TMT meeting.

**Grand Coulee Flow Shaping in April:**

An SOR is expected in the next week for Grand Coulee flow shaping from the Salmon Managers. Dave Wills, USFWS, reported that likely the SOR will be for an April 21 beginning date to ramp up Priest Rapids flows so that there is a minimum of 135 kcfs by April 24, while maintaining Grand Coulee refill objectives. At this point, the Salmon Managers expect that both objectives can be reached. TMT agreed with the concept of the request, which will be put into writing and circulated via email. Unless there is a significant change to the request expressed today, there will not be a need for a TMT conference call on this issue as there were no objections expressed by members.

**Fish Spill Status and Tracking:**

Laura Hamilton, COE, provided a handout of a 12-hour average total dissolved gas with a 24-hour spill. Three exceedances of state water quality standards were tracked, at Lower Monumental and Ice Harbor, due to “uncertainties when using best professional judgment”. A suggestion was made to track times when there is not spill to the gas cap. The COE is working on spill guidance criteria and invites anyone interested to observe how the tracking process works.

**Lower Granite RSW Operations:**

Rudd Turner, COE, reported that the RSW test began on Monday, April 14 at 6am. There is a difference between the total spill estimate in the proposal versus real time spill due to a rounding function of the monitoring system. The last day of the randomized block design test is May 29.

**Current System Conditions:**

*Fish migration status:* Adult spring Chinook have been observed at high and increasing numbers. Large numbers of juveniles have also been observed at Lower Granite in the last few days. The tracking of chum for 2003 has shown the highest numbers in recent years. Tailwaters have been good for both chum and fall Chinook. The end of emergence date for chum is yet undetermined. The tailwater at Bonneville has gotten close to 15.5’ elevation levels at 75 kcfs spill. Fish protection is the number one priority; the spill test is number 2. The Salmon Managers will continue to monitor the situation.

*System Conditions:* Hungry Horse is filling at ¾' per day and is at elevation 3514.8'. Grand Coulee is at elevation 1582.9'. Dworshak is operating for flood control at 16 kcfs outflows. Libby is at 4 kcfs outflows; potential sturgeon operations at Libby are being discussed.

**Lake Roosevelt Forum:**

Shane Scott, WDFW, confirmed that there will be an 8:30-10 am “meet and greet” meeting for TMT and the Transboundary Gas Group, followed by a regular TMT meeting from 10 am-2 pm (including an hour lunch break).

**Agenda:**

- Priest Rapids SOR
- Lower Columbia Seasonal Strategy
- Lake Roosevelt Issues
- Current System Conditions
- Upper River Tribal Issues (Tony Norris will coordinate this)
- Towboat Association Update

**\*The call-in number for the April 23 meeting in Spokane will be (509) 358-7488. The next TMT meeting in Portland will be held on May 7 from 9am-noon.**

***1. Greeting and Introductions***

The April 16, 2003 Technical Management Team meeting was chaired by Cindy Henriksen of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3945.

***2. Towboat Association and NWW Report on Lower Snake Field Observations.***

Henriksen said that, as agreed at the last TMT meeting, representatives from the Corps' Walla Walla District, the Coast Guard and the Columbia River Towboat Association (CRTA) had done a site visit to some of the problem navigation areas in the Lower Snake River. This site visit resulted in a Corps Memorandum for Record outlining what was found; Ann Glassley of the Corps Walla Walla District went briefly through the memorandum, noting that no areas of navigational concern were found at the sites visited in Ice Harbor, Lower Monumental or Little Goose pools. One area of concern was found in Lower Granite pool, where some readings of less than 14 feet depth were found at the edges of the navigation channel. Other areas of known concern, where navigation channel depth readings are less than 14 feet, include the downstream approach to the Lower Monumental lock and the confluence of the Snake and Clearwater Rivers.

CRTA President Larry Johnson noted that the Towboat Association had subsequently developed a new request for pool elevation increases, dated April 15. This document makes the following recommendations:

- A comprehensive bottom survey of the Snake River navigation channel is necessary to determine the extent of shoaling through the system.
- For 2003, MOP+1 is essential to safely navigate the Snake River.
- It is unlikely that operation of the reservoirs at MOP+1 will be sufficient in the near future to ensure a 14-foot channel and adequate water over the sills at the navlocks.
- Stopping the spill at Lower Granite may be necessary to allow tows to safely depart the navlock.
- Three navigation aids (buoys) are needed at Steptoe Lower Range to mark the shoal area.
- Dredging of the Snake River must be completed to avoid the risk of an environmental catastrophe, protect the safety of the operators and crews navigating the system and to ensure the reliability and integrity of the supply chain.

The group devoted a lengthy discussion to this document, offering a series of clarifying questions and concerns. Both the Memorandum for Record on this issue and the April 15 CRTA operational request are available via hotlink from that agenda for today's meeting on the TMT homepage; please refer to these documents for further details.

Johnson noted that the pool elevation requested in the CRTA document are the same levels implemented in 2002. He went to the white board to illustrate what happens when down-bound tows try to "outrace" the current in order to maintain steerage way; this often results in the towboat and barges heading down the navigation channel at an angle, causing the bow and stern of the tow, which may be up to 640 feet long, to exceed the 250-foot-wide navigation channel. Another CRTA representative noted that the recent survey was done in the navigation channel only; just outside the channel, there are many areas where the depth is less than the 14 feet the CRTA is requesting for a minimum safe operating depth.

Reclamation's Tony Norris suggested that it might be possible to run the fill valves as the tow leaves the lock in order to minimize the effect of opening the lock gate; a Corps representative replied that, while that type of operation is not allowed under current Corps protocol, it may be something that could be investigated.

Carl Knaack of the Corps Walla Walla District noted in response to Point 1 of the CRTA recommendations that the Corps is planning to conduct a comprehensive bottom survey of the Snake River navigation channel this August. In response to a question from Boyce, Henriksen said Lower Granite, Little Goose, and Ice Harbor are currently being operated at MOP+1, Lower Monumental is operating at MOP.

Does operation of the Lower Granite RSW mitigate the spill problem cited by the CRTA at that project? Jim Litchfield asked. Yes, Chris Ross replied – when the RSW is operating, Lower Granite spills only 19 Kcfs. How long does it take for a barge to exit the navlock and clear the project? Bettin asked. It takes 10-15 minutes, Johnson replied. So if we stop spill at Lower Granite for 15 minutes as the barges exit, that would solve

the problem? Bettin asked. Yes, but it would also impact the RSW experimental design at Lower Granite, Steve Pettit replied.

The group discussed the ramifications of the CRTA's operational requests, including their impact on the RSW test and the logistics of simultaneously operating the lock and adjusting spill at Lower Granite during the evening hours, when only one operator is on duty. It was agreed that more information is needed from the project operators before this issue can be resolved. Pettit noted, however, that the test schedule is laid out in the spring/summer update to the 2003 Water Management Plan; if there is any flexibility in the towboat departure schedule, they could avoid problems by traversing Lower Granite Dam only on days when the RSW is being operated. Johnson said he will investigate that possibility. Another participant noted that, even on days when uncontrolled spill is occurring at the Lower Snake projects, a flat spill pattern across the face of the dam provides the best conditions for navigation.

Kyle Martin noted that the CRITFC tribes are strongly opposed to operating the Lower Snake projects outside of MOP. The BiOp specifies MOP operation, and particularly if the operating agencies propose moving to MOP+2 or +3, the tribes would call for NMFS to re-initiate consultation. Ross added that in the wake of the dredging court case, NMFS intends to re-initiate consultation on the dredging issue this winter. That would be a huge help, Johnson said.

Boyce said that, if the CRTA could provide specific log data showing where, when and at what pool elevation navigational problems occur, that would help the TMT optimize Lower Snake pool operations for both navigation and for fish. Johnson replied that the Towboat Association is unwilling to provide such log information unless required to do so by the Coast Guard, noting that the point of today's presentation is to share the CRTA membership's operational experience with this problem.

Boyce said that, in his view, the CRTA has not provided the data requested at the last TMT meeting to truly pinpoint the problem with MOP operation. That information won't really be available until the Corps survey is completed this August, Johnson replied. Travis Coley of the Coast Guard representative that there would legal consequences if the towboat companies were to voluntarily provide log information about groundings; that would be like going to a state policeman and telling him you routinely speed, he said, adding that companies could face financial penalties and could even lose their navigational licenses for some infractions.

Boyce noted that Oregon wants to stay as close to the requirements laid out in the Biological Opinion as possible; he reiterated his view that he still has not heard much hard data to support an excursion from the BiOp's MOP operation requirement. Henriksen revisited the findings of the Memorandum for Record, noting that it had confirmed some of the CRTA's claims. What we're trying to do is just get through this season, she said, in the hopes that there may be some movement on the dredging issue prior to the next migration season.

Moving on to the spill operation at John Day, Johnson said that, at 2:15 this morning, the Shaver tug *Cascades* requested an alternative spill pattern at John Day

because he judged the spill pattern to be too dangerous to navigate. The project operator replied that he was unable to alter the spill pattern except for Tidewater oil barges. We're here again, as we have been in past years, asking for the same thing we always do, Johnson said. It's my understanding that once total river flow reaches a certain level -- 300 Kcfs -- that change in spill pattern will be made, Henriksen replied. However, all barges, not just oil barges, have the same handling and maneuverability issues, Johnson said.

What is the specific request? Boyce asked. When certain spill and flow conditions have occurred in the past, safety can be an issue at John Day, Johnson replied; what we're asking for is when total river flow is 300 Kcfs or more, the Corps provide a flat spill pattern across the project; at flows of less than 300 Kcfs, we're requesting zero spill while the tows exit the locks. This is just during the lockage? Boyce asked. Yes, was the reply. Another CRTA participant noted that the exception used for Tidewater barges when flow is below 300 Kcfs -- zero spill while the barge exited the project -- worked very well for both navigation and fish attraction.

So at flows of less than 300 Kcfs, when you can't do a flat spill pattern, you're requesting zero spill for the 15-20 minutes the tows are passing the project? Boyce asked. That's correct, and a flat spill pattern when there is enough total river flow to allow it, was the reply. Boyce said his preference would be to go to a flat spill pattern at total river flows below 300 Kcfs. Pettit replied that it may not be feasible, logistically, to change the John Day spill pattern to a flat pattern in a timely enough fashion. The Corps' concern is that, at flows of less the 300 Kcfs, a flat pattern could redistribute the fish and contribute to egress problems, Rudd Turner added. And approximately how often do lockages occur at night this time of year? Boyce asked. Approximately five or six per night, Johnson replied.

After a few minutes of further discussion, Henriksen said the Corps will investigate the questions raised at today's meeting regarding how long it takes to change the spill settings at John Day, at what spill volume it becomes feasible to go to a flat spill pattern etc. She will then review those answers with the CRTA in the hopes of developing some potential solutions. And any changes to the BiOp spill program need to be coordinated with the salmon managers, Boyce added.

What do we do in the meantime, given the fact that total river flow is currently well below 300 Kcfs? -- I don't think we can wait another week to make a decision on this issue, Bettin said. Perhaps we can change the instruction to the lock operator such that he can change the spill operation if the tow boat captain feels the current pattern is hazardous to his tow, a CRTA representative suggested. As long as that does not result in a reduction in spill, Boyce replied. Henriksen reiterated that the Corps needs more time to answer some of the questions raised at today's meeting.

Ultimately, it was agreed that the captains of tow boats approaching John Day will radio ahead to indicate that a safety concern exists. Henriksen said she will attempt to answer the questions raised at today's meeting as soon as possible, and will communicate with the CRTA and the TMT membership by later today, if possible, to develop a consensus solution to the issue of what kind of spill will be provided at John

Day during lockages when river flows are less than 300 Kcfs. It was agreed that there may need to be a conference call on this issue prior to the next TMT meeting on April 23. And in the interim, we will continue to operate the Lower Snake pools at MOP+1, except at Lower Monumental which will continue to operate at MOP, Henriksen said.

### ***3. Water Management Plan (WMP) Update.***

Scott Boyd reported that the spring/summer update to the 2003 WMP is still in draft form; there are still a few additional items that need to be filled in. Boyd went briefly through the sections that have been added to the most recent draft of the update, including the research section requested by NMFS. He asked anyone with further comments on the draft to provide them to him as soon as possible. Boyd suggested that the TMT attempt to finalize the spring/summer update at its May 7 meeting; it was so agreed.

### ***4. Grand Coulee Flow Shaping in April.***

David Wills said the salmon managers have been discussing their preferred Grand Coulee operation this spring, and are in the process of developing an SOR formalizing their recommendations. Where we're headed is that, starting April 21, we would like the action agencies to begin ramping up Grand Coulee discharge to achieve the 135 Kcfs flow objective at Priest Rapids, Wills said; we would like Priest Rapids discharge to be at 135 Kcfs by April 24. We would then like the operating agencies to maintain that flow objective through the end of June, to the extent feasible, while also targeting Grand Coulee refill by June 30.

So the request will be to maintain the 135 Kcfs at Priest Rapids for as long as possible until we need to reduce Grand Coulee outflow in order to refill the project by June 30? Jim Litchfield asked. That's correct, Wills replied, although we will also be presenting information that shows that it should be possible to meet the 135 Kcfs flow target at Priest Rapids through June and still achieve refill at Grand Coulee. And what if it isn't possible to do both? Tony Norris asked -- which goal should take precedence? We're still talking about that, Boyce replied.

You're talking about a 135 Kcfs weekly average flow at Priest Rapids, not 135 Kcfs instantaneous flow? Bettin asked. That's correct, Ross replied, adding that, because the ramp-up is requested to begin on April 21, a Monday, week-average flows at Priest Rapids will be less than the 135 Kcfs target during the first week of this operation. And the following week the average flow should be 135 Kcfs or higher? Litchfield asked. That's correct, said Boyce. I think we're assuming about 110 Kcfs as a day-average at Priest Rapids on April 21, stepping up to 135 Kcfs as a day-average by April 24, Ross added. And there is no need for a TMT conference call on this issue unless there is a dramatic change in the flow situation? Silverberg asked. That's correct, was the reply.

### ***5. Fish Spill Status and Tracking.***

Laura Hamilton updated the TMT on average 12-hour and 24-hour TDG, spill and flow at various Lower Snake and Columbia River projects. She noted that there were

slight TDG exceedences at Ice Harbor on April 12 and at Lower Monumental and Ice Harbor on April 13. Hamilton said the Corps has begun tracking TDG exceedences by type, including, for example, exceedences that occur due to uncertainties when using best available judgement to apply the spill guidance procedure.

Ross said that, in looking at this information, NOAA Fisheries would suggest that Lower Monumental spill could probably be increased to 45 Kcfs. Hamilton replied that the Corps has some concerns about the fish screen design at Lower Monumental and the possibility of increased fish mortality at that project at higher spill volumes when river flows are low; currently, the spill parameters at that project are up to spill up to the gas cap, but spill is not to exceed 50% of total river flow. The group discussed the feasibility of highlighting periods in which the BiOp spill levels are not being met; Hamilton noted that it is virtually impossible to hit the BiOp spill levels exactly. Boyce said the salmon managers will attempt to track these low-spill periods themselves.

#### ***6. Lower Granite RSW Operations.***

Rudd Turner said the RSW test started at 6 a.m. Monday, April 14, with the RSW test condition. The Lower Granite total average spill volume has been running about 20.6 Kcfs during the RSW-on period, slightly higher than the 19.3 Kcfs estimated prior to the test. Ross noted that, according to the hourlyies, Lower Granite went to 19.3 Kcfs total spill during the last hour of this test block this morning, so perhaps whatever was causing that discrepancy has now been adjusted.

The test has now entered its second block, in which Lower Granite will not spill during the day, but will spill up to the gas cap for 12 hours at night for the next two days. The two-day RSW on/BiOp spill on test block operation will continue through May 28. Turner added that, under the current test design, the RSW is not operating during the BiOp spill test blocks. In response to a question from Silverberg, Turner said he will develop an email memo describing why the RSW test spill pattern has changed this year; Litchfield noted that, at a recent IT meeting, the USGS reported that the spill pattern used last year was creating egress problems for juvenile migrants.

#### ***7. Current System Conditions.***

Chris Carlson said that, given falling river temperatures, the current estimate of the end of Hanford Reach emergence is now April 27, rather than April 25. For the week of April 7-13, the average flow at Priest Rapids was 100.8 Kcfs; the flow band ranged between 40 Kcfs on April 8 to 20 Kcfs, where it is currently. The 30 Kcfs flow band was exceeded on April 7 and April 10. Field crews sampled 22 stranding areas during the week; they found 17 chinook zero mortalities.

Kyle Martin of CRITFC said his organization has been concerned about the precipitous drop in hourly flows at Priest Rapids on Friday; they were out on the reach on Friday and saw a lot of dead fish – perhaps as many as 100,000. Paul Hoffarth confirmed that stranded fish were found in over 50% of the sample sites WDFW field crews looked at on Saturday and Sunday. What was the reason for the significant deviation from the flow bands on the 8<sup>th</sup> and the 10<sup>th</sup>? Ron Boyce asked. It was the large volume of water

coming down the river after the weekend operation, primarily, Carlson replied – it isn't easy to maintain the flow bands when the flow coming downstream increases significantly in a short period.

Boyce said that, in his opinion, Grant County PUD needs to be doing a better job of staying within the flow bands; there were a record number of spawners last year, and the samples taken last week probably are indicative of significant losses. Is there anything Grant can be doing to improve their performance? Boyce asked. Carlson replied that this is not just a Grant County issue; there are other operators whose operations impact what Grant County is able to do. Carlson replied that the fish protection operation is not a requirement of Grant County PUD's license; they are voluntarily trying to meet the flow bands. There is a meeting on May 1 at Sea-Tac to discuss Vernita Bar/Hanford Reach operations; those interested in attending should contact Joe Lucas, Carlson added.

Any sense of what the numbers you saw last weekend mean in total fish losses? Boyce asked. We haven't been able to extrapolate that because of the limited number of random samples, Hoffarth replied; I would hesitate to impose any kind of expansion on the numbers we saw, but they were significant. Exactly – if you expand the numbers that were seen over the entire reach, the impact was probably very large, in terms of the number of juvenile fish killed, Boyce said. In response to a question from Scott Bettin, Hoffarth said WDFW is estimating that there are 30 million to 35 million juvenile chinook moving down through the Hanford Reach this year, approximately double the 10-year average.

My concern is that there are a lot of days between now and May 1, said Boyce – I would urge Grant County to do everything they can to avoid large sudden flow fluctuations that will strand these fish. Hoffarth added that, at the current low flows through the Hanford Reach, even small fluctuations in Priest Rapids flow can result in significant stranding. Carlson noted that Grant County had maintained somewhat higher weekend flows last weekend, attempting to target 80 Kcfs as the minimum weekend flow. Hoffarth noted that some additional flow from Grand Coulee would help this situation. Carlson said Grant County will continue to do whatever it can to minimize flow fluctuations from Priest Rapids and to stay within the agreed-upon flow bands.

Moving on to the status of the fish migration, beginning with adult passage, Boyce noted that nearly 79,000 spring chinook have passed Bonneville to date, compared to a 10-year average of just over 30,000 for this date. He added that nearly 8,000 spring chinook passed Bonneville on April 15 alone. I can remember some years when the total spring chinook run for the year was only 80,000 fish, Ross observed. Boyce added that the spring chinook run to the mouth of the Columbia was upgraded from 158,000 to 174,000 earlier this week.

With respect to juvenile passage, Ross provided information on chinook and steelhead smolt index numbers at Lower Granite, McNary, John Day and Bonneville. He said that, in general, juvenile passage indices have increased significantly at the Lower Snake and Lower Columbia projects in recent days. In other words, said Boyce, there are significant numbers of juveniles on the move throughout the system.

Boyce also provided information developed jointly by Oregon and Washington showing lower river chum and fall chinook captures in the Ives/Pierce Island areas in 2003, noting that this is one of the most successful spawning escapement years on record. Things are going fairly well in the chum arena, and we're pleased with how that's going to date, Boyce said. Do you have an estimated end of emergence? Bettin asked. Not yet, I'll keep you posted, Boyce replied. The reason I ask is that we're having some difficulty maintaining the 15-foot tailwater elevation at Bonneville during some hours when we're spilling 75 Kcfs, Bettin said. We'll watch that, said Boyce, but hopefully we'll start to see flows in the river coming up over the next few weeks.

Moving on to current reservoir operations, Norris reported that the current flow at Columbia Falls is exceeding 10 Kcfs; Hungry Horse has begun filling more rapidly – about three-quarters of a foot per day. The current elevation at the project is just under 3515 feet. Henriksen said Dworshak continues to release 16 Kcfs, and is operating for flood control – the current elevation at the project is 1577 feet and drafting slightly. Dworshak may be as low as 1565 feet by the end of April, she added, but will not meet its April 30 flood control target. She added that Libby continues to release 4 Kcfs; so far, no firm decision has been made about when a Libby sturgeon “pulsing” operation may be provided in 2003. In response to a question, Norris added that the current elevation at Grand Coulee is 1282.9 feet.

Henriksen added that the Corps did another Q-Adjust run last week, looking at Grand Coulee elevations if the 135 Kcfs week-average flow target was met at Priest Rapids through June, as well as a second run showing the effects of a ramping-up of Priest Rapids flow. According to this run, we're still looking at about 81 Kcfs as a seasonal average flow at Lower Granite, so little has changed there, Henriksen said. So we're close, but not quite up to, the threshold for spill at the Lower Snake collector dams? BPA's John Wellschlagler asked. Correct, Henriksen replied. Henriksen added that the most recent STP run, based on the most recent 10-day precipitation forecast, shows significantly less volume than last week's run -- 16.6 MAF at Lower Granite, for example, down from 17.1 MAF in last week's forecast.

#### ***8. New System Operational Requests.***

No new SORs were presented at today's meeting.

#### ***9. Recommended Operations.***

Recommended operations were covered during a previous agenda item.

#### ***10. Next TMT Meeting Date.***

The next Technical Management Team meeting was set for Wednesday, April 23 during next week's Lake Roosevelt Forum conference in Spokane. The next regular TMT meeting was set for May 7 (no meeting April 30 unless needed). Meeting summary prepared by Jeff Kuechle.

Summary of 14 APR 2003 QADJ Model Runs

14-Apr-03

CASE 1: 135 kcfs at PRIEST RAPIDS AP2-JUN

Assumptions:

- \* Streamflows were adjusted to the April Final Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were the 15 April forecasted elevations from STP.
- \* Grand Coulee operates to meet 135 kcfs at Priest Rapids 15 Apr - 30 Jun. Coulee targets El. 1285, 1280, and 1278 in July, Aug 15, and Aug 30.
- \* Hungry Horse operates to VARQ, meets minimum flows at Columbia Falls, targets full in June, El. 3550 in July, El. 3545 Aug 15, and 3540 ft by 31 Aug.
- \* Brownlee operates to flood control elevations.
- \* Dworshak releases 15 kcfs in April, targets full in June, releases 13 kcfs in Jul - Aug for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on min flow (4 kcfs) or VARQ flood control Mar - Apr, conducts a sturgeon pulse operation in May and Jun, targets El. 2454 in July with minimum bull trout flow of 7 kcfs, targets El. 2449, and 2439 on Aug 15 and Aug 30.

Results:

Priest Rapids Meets Flow Objectives of 135 kcfs Apr2 - Jun:

Month	BiOp Target	No. Times	Average Flow
		Meeting Target out of 59 yrs	for 59 Years (kcfs)
Apr2	135	59	136
May	135	59	144
Jun	135	59	152

Lower Granite Meets Flow Objectives of 89.1 kcfs in Apr - May, 76.2 kcfs in June and 50.5 kcfs in Jul - Aug:

Month	BiOp Target	No. Times	Average Flow
		Meeting Target out of 59 yrs	for 59 Years (kcfs)
Apr2	89.1	11	74
May	89.1	32	90
Jun	76.2	36	82
Jul	50.5	6	41
Aug1	50.5	0	36
Aug2	50.5	0	28
<b>APR1-JUN *</b>	<b>84.9</b>	<b>5</b>	<b>81</b>

*\* For APR1 in all years: observed data for 1 - 13 April and short-term model results for 14 - 15 Apr were used. (This was done to compare results from last run for Apr 1 - Jun 30.)*

**Lower Granite meets threshold target for APR1-JUN (81.2 kcfs) in 35 of the 59 years.**

McNary Meets Flow Objectives of 220 kcfs in Apr2 - Jun and 200 kcfs in Jul - Aug:

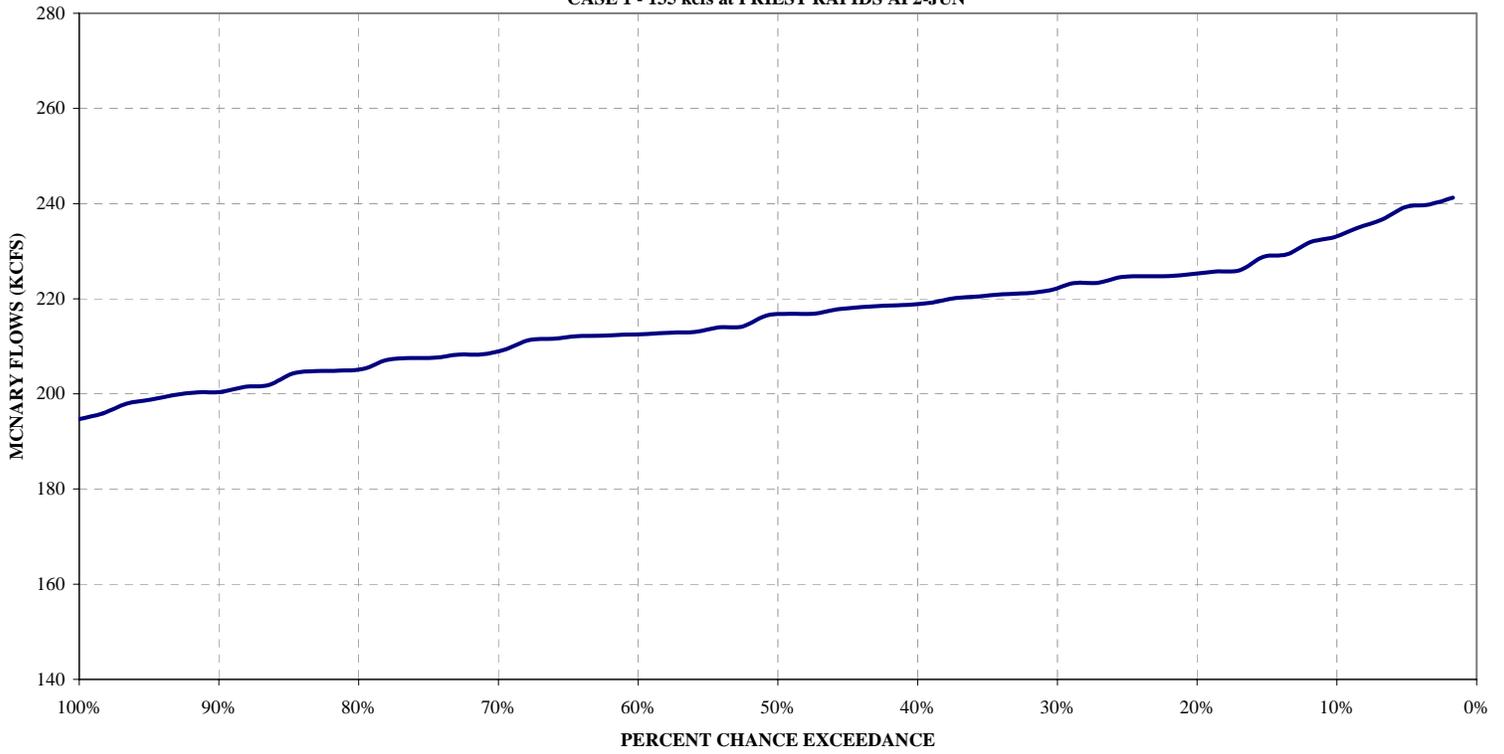
Month	BiOp Target	No. Times	Average Flow
		Meeting Target out of 59 yrs	for 59 Years (kcfs)
Apr2	220	5	204
May	220	19	216
Jun	220	25	216
Jul	200	0	143
Aug1	200	0	140
Aug2	200	0	123

Projects Refill by June 30:

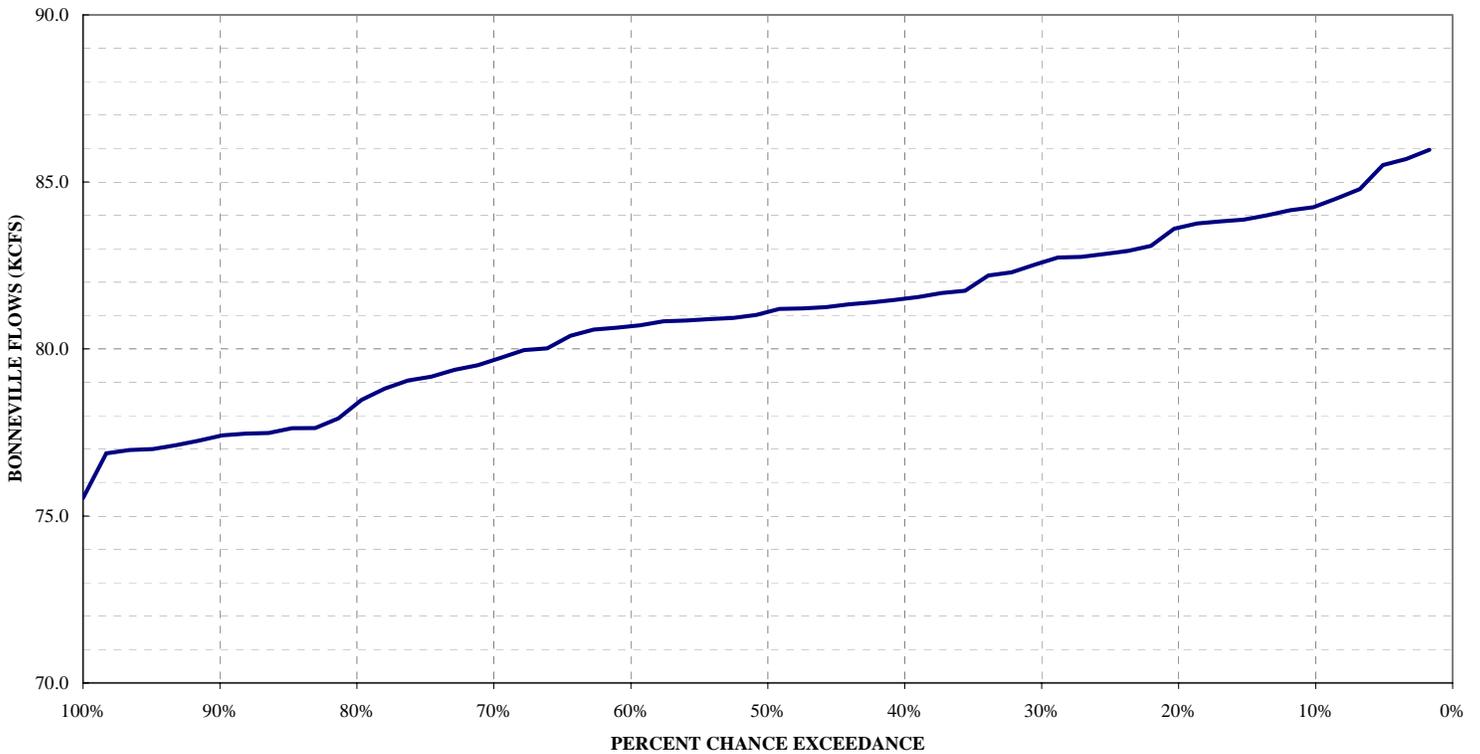
Month	No. Times	Average Elevation	Full
	Meeting Target out of 59 yrs	on 30 Jun for 59 Years	
Libby	10	2451.1	2459.0
Hungry Horse	59	3560.0	3560.0
Grand Coulee	52	1289.1	1290.0
Dworshak	59	1600.0	1600.0

Note: Grand Coulee operates to meet Priest Rapids flow of 135 kcfs Apr2 - Jun.

**MCNARY OUTFLOW**  
**MAY-JUNE AVERAGE**  
**CASE 1 - 135 kcfs at PRIEST RAPIDS AP2-JUN**



**LOWER GRANITE**  
**APR-JUN OUTFLOW**



## Summary of 14 APR 2003 QADJ Model Runs

14-Apr-03

CASE 2: 100 kcfs at PRIEST RAPIDS in AP2, 220 kcfs at McNARY in MAY, Refill COULEE in JUN

**Assumptions:**

- \* Streamflows were adjusted to the April Final Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were the 15 April forecasted elevations from STP.
- \* Grand Coulee operates to meet 100 kcfs 15 - 30 Apr at Priest Rapids, 220 kcfs at McNary in May, and targets El. 1288, 1285, 1280, and 1278 in June, July, Aug 15, and Aug 30.
- \* Hungry Horse operates to VARQ, meets minimum flows at Columbia Falls, targets full in June, El. 3550 in July, El. 3545 Aug 15, and 3540 ft by 31 Aug.
- \* Brownlee operates to flood control elevations.
- \* Dworshak releases 15 kcfs in April, targets full in June, releases 13 kcfs in Jul - Aug for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on min flow (4 kcfs) or VARQ flood control Mar - Apr, conducts a sturgeon pulse operation in May and Jun, targets El. 2454 in July with minimum bull trout flow of 7 kcfs, targets El. 2449, and 2439 on Aug 15 and Aug 30.

**Results:**

Priest Rapids Meets Flow Objectives of 100 kcfs Apr2 and 135 kcfs May - Jun:

Month	Target	No. Times Meeting Target out of 59 yrs	Average Flow for 59 Years (kcfs)
Apr2	100	59	110
May	135	58	156
Jun	135	56	155

Lower Granite Meets Flow Objectives of 89.1 kcfs in Apr - May, 76.2 kcfs in June and 50.5 kcfs in Jul - Aug:

Month	BiOp Target	No. Times Meeting Target out of 59 yrs	Average Flow for 59 Years (kcfs)
Apr2	89.1	11	74
May	89.1	32	90
Jun	76.2	36	82
Jul	50.5	6	41
Aug1	50.5	0	36
Aug2	50.5	0	28
<b>APR1-JUN *</b>	<b>84.9</b>	<b>5</b>	<b>81</b>

*\* For APR1 in all years: observed data for 1 - 13 April and short-term model results for 14 - 15 Apr were used. (This was done to compare results from last run for Apr 1 - Jun 30.)*

**Lower Granite meets threshold target for APR1-JUN (81.2 kcfs) in 35 of the 59 years.**

McNary Meets Flow Objectives of 220 kcfs in Apr2 - Jun and 200 kcfs in Jul - Aug:

Month	BiOp Target	No. Times Meeting Target out of 59 yrs	Average Flow for 59 Years (kcfs)
Apr2	220	4	178
May	220	48	228
Jun	220	28	220
Jul	200	0	141
Aug1	200	0	140
Aug2	200	0	122

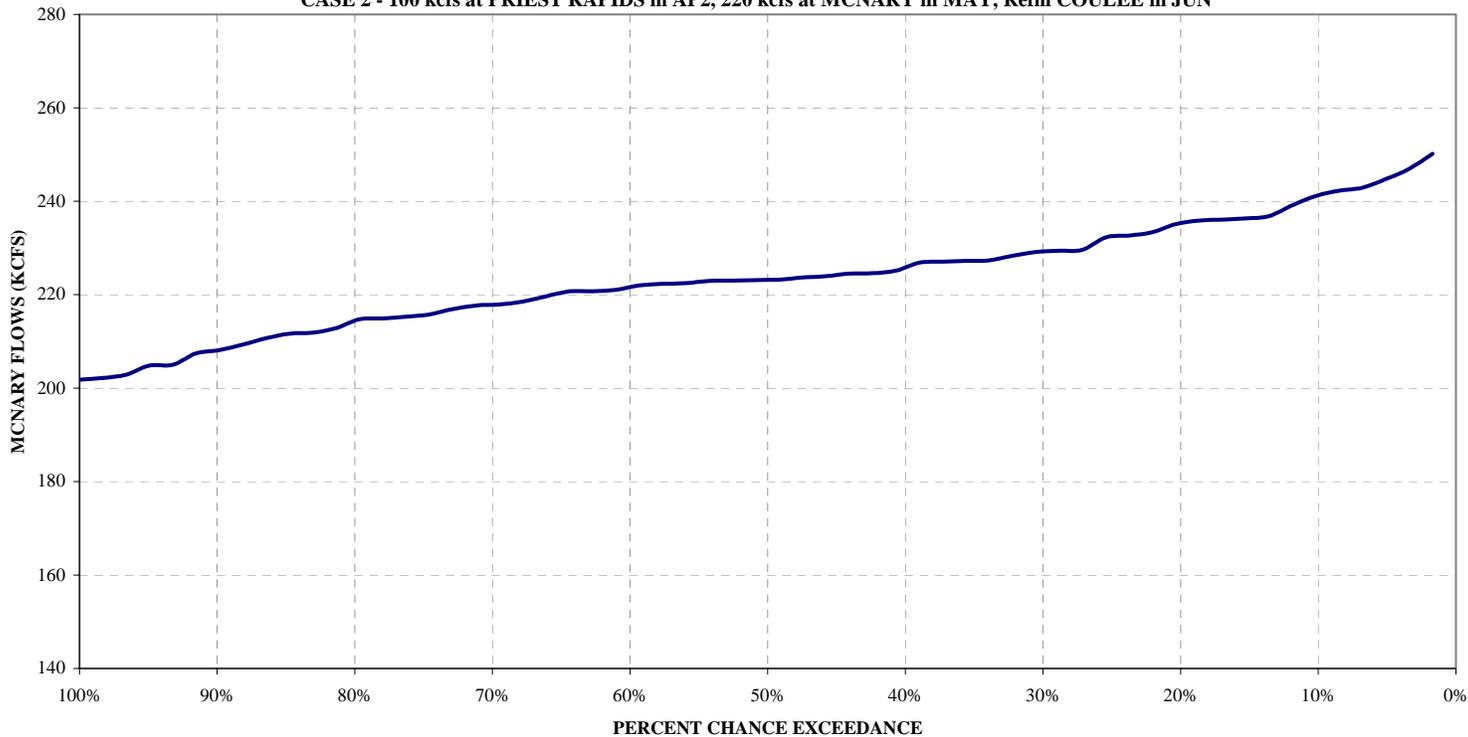
Projects Refill by June 30:

Month	No. Times Meeting Target out of 59 yrs	Average Elevation on 30 Jun for 59 Years	Full
Libby	10	2451.1	2459.0
Hungry Horse	59	3560.0	3560.0
Grand Coulee	59	1288.0	1288.0
Dworshak	59	1600.0	1600.0

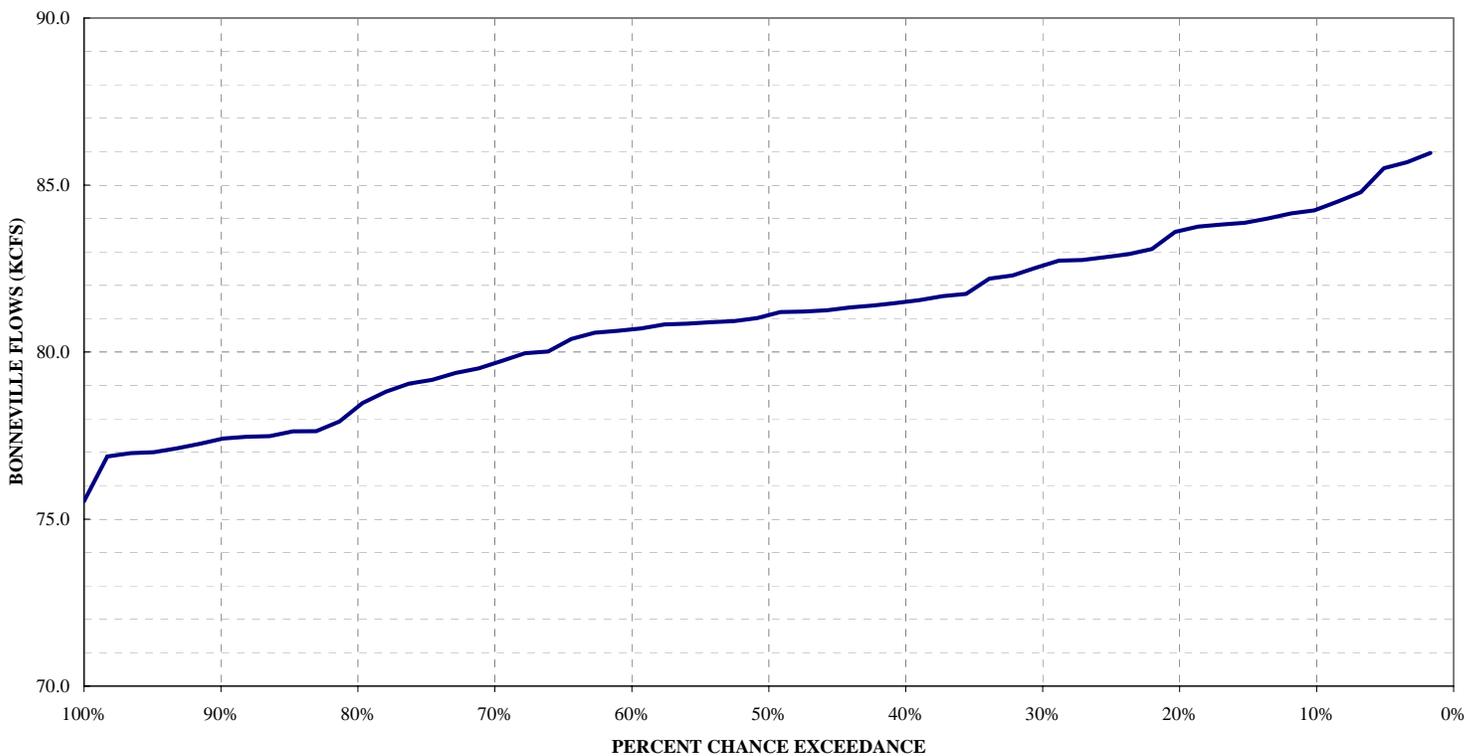
Note: Grand Coulee operates to meet 100 kcfs at Priest Rapids in Apr2, 220 kcfs at McNary in May and refills to Elev 1288 in Jun.

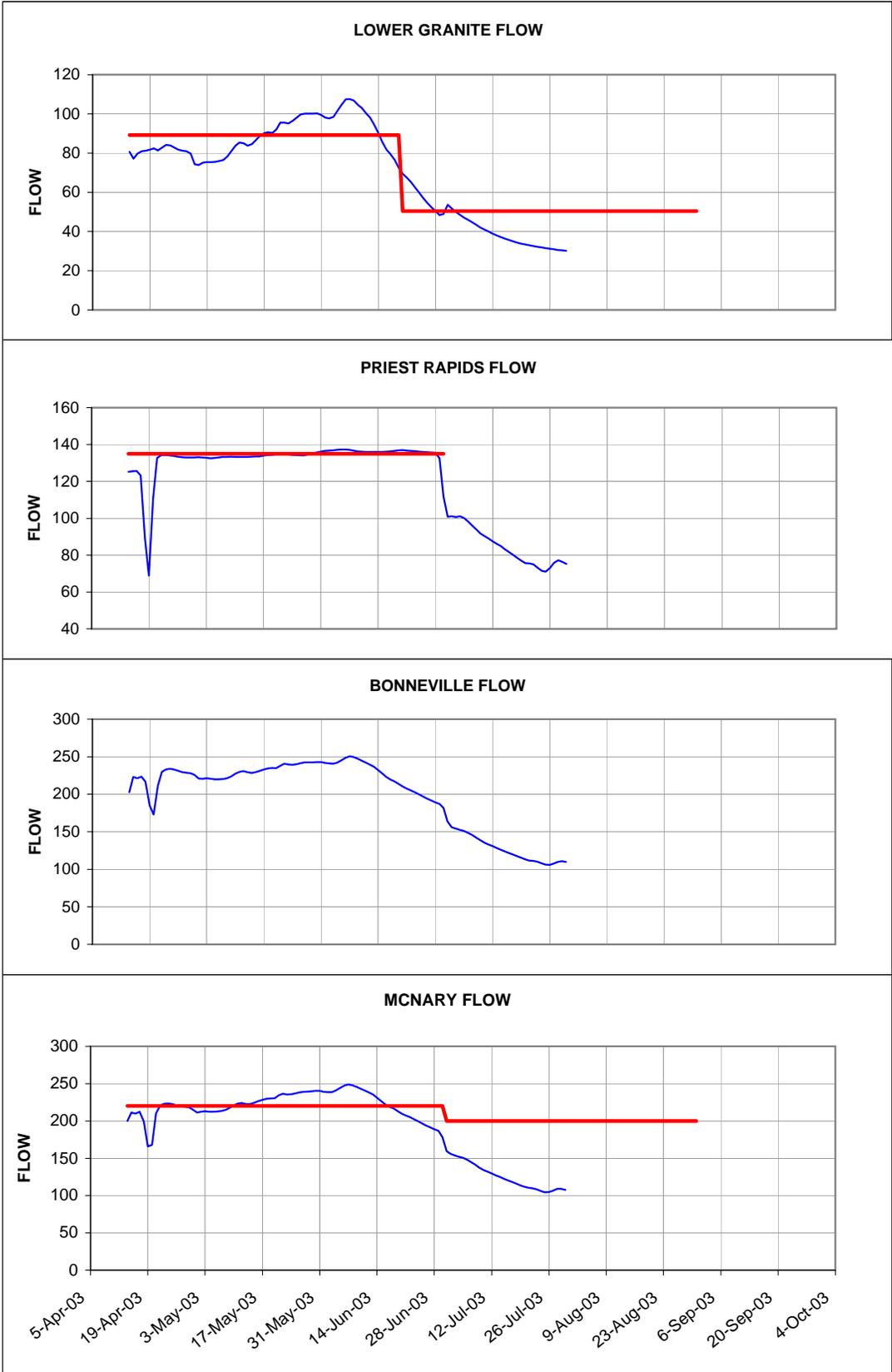
**MCNARY OUTFLOW  
MAY-JUNE AVERAGE**

**CASE 2 - 100 kcfs at PRIEST RAPIDS in AP2, 220 kcfs at MCNARY in MAY, Refill COULEE in JUN**



**LOWER GRANITE  
APR-JUN OUTFLOW**





## MEMORANDUM FOR RECORD

SUBJECT: Site Visit on Snake River

1. Walla Walla District, U.S. Army Corps of Engineers has received a letter of concern from the Columbia River Towboat Association (CRTA) with regard to operation of Snake River pools at minimum operating level. Because dredging has not occurred since FY1998, CRTA has submitted the location of several areas on the Snake River that they feel are potentially unsafe for passage with towboats if the pools are operated at minimum operating pool (MOP) to accommodating smolt passage.
2. At the TMT meeting on 9 April 2003, CRTA voiced their concerns. At that time it was decided to do site visits on the Snake River at the locations where Walla Walla District, U.S. Army Corps of Engineers had no previous survey data. The Coast Guard volunteered to provide a boat, depth finder and GPS. The results of the site visits will be discussed at the TMT meeting 16 April 2003.
3. Site visit details are as follow:

**Spot Depth Checks on Snake River**

Participants in site visits on 11 April 2003, were:

Ely North, BM2, U.S. Coast Guard  
Mike Tosma, SM, U.S. Coast Guard  
Fred Harding, Shaver Transportation  
Ted Niezgodna, Soil/Civil, Walla Walla District, U.S. Army Corps of Engineers  
Ann Glassley, Operations, Walla Walla District, U.S. Army Corps of Engineers

**Summary of Findings**

- Note:
1. Coast Guard provided boat, GPS and Depth Finder.
  2. GPS coverage was intermittent in some locations.
  3. Depth readings are in feet from surface of water to river bottom surface.

**Ice Harbor Pool – MOP 437'**

- The area between Snake River Miles 27 and 29, just below the Sheffler grain elevator.
  - Actual pool elevation at 8:30 am - 439.83'
  - Depth readings along shoal ranged from 18'-28'
  - Depth readings at MOP would range from 15.5'-25.6'

CENWW-OD-TM

SUBJECT: Site Visit on Snake River

- Because the shoaling is moving outward toward the navigation channel, this area should be added to future surveys.
- Just immediately above Sheffler, between the Walker grain elevator and the airstrip at Burr, shoal area marked by buoys “34” and “38”. Snake River Mile 31-32.
  - Actual pool elevation at 8:00 am - 439.83’
  - Depth readings along shoal ranged from 18’-34’
  - Depth readings at MOP would range from 15.5’-31.6’
  - Because the shoaling is moving outward toward the navigation channel, this area should be added to future surveys.

**Lower Monumental Pool – MOP 537’**

- Beginning on lower McGuire Range up bound to the lower guide wall entrance of Little Goose Lock & Dam. Snake River Mile 68-70.
  - Actual pool elevation at 10:30 am – 538.21’
  - Depth readings along shoal ranged from 26’-40’
  - Depth readings at MOP would range from 24.8’-38.8’

**Little Goose Pool – MOP 633’**

- Approach to the upper entrance of the locks beginning at buoy “2”.
  - Actual pool elevation at 11:30 am – 634.40’
  - Depth readings along shoal ranged from 17’-20’
  - Depth readings at MOP would range from 15.6’-34.2’
  - Because the shoaling is moving outward toward the navigation channel, this area should be added to future surveys.
- Schultz Bar between buoys “29A” and “35”. Snake River Mile 101-102
  - Actual pool elevation at 3:00 pm 634.54’
  - Depth readings along shoal ranged from 17’-30’
  - Depth readings at MOP would range from 15.6’-28.6’
  - Latest survey of this location in September 2002 indicated no problems in the navigation channel
- Almota Grain elevator – The areas immediately above and below the two elevators. Snake River Mile 103.5-104
  - Actual pool elevation at 3:30 – 634.54’
  - Depth readings along shoal ranged from 18’-40’
  - Depth readings at MOP would range from 16.5’-38.5’
- Entrance to the lower lock at Lower Granite along what is known as Davis Bar.
  - Actual pool elevation at 4:00 pm – 634.66’

CENWW-OD-TM

SUBJECT: Site Visit on Snake River

- Depth readings ranged from 16'-28'
- Depth readings at MOP would range from 14.3'-26.3'
- Latest survey of this location in September 2002 indicated the need to dredge. This area was in the FY2003 dredging contract that was cancelled.

**Lower Granite Pool – MOP 733'**

- The area known as Steptoe Lower Range on the south side of the river. Snake River Mile 129-130.
  - Actual pool elevation at 6:00 pm – 734.54'
  - Depth readings along shoal ranged from 14'-30'
  - Depth readings at MOP range from 12.5'-28.5'
  - It appears that most, if not all of the depth readings taken on the site visit are outside the navigation channel.
  - Because the shoaling is moving outward toward the navigation channel, this area should be added to future surveys.
  - CRTA requested buoys placed at the 30' depth

**Additional Areas of Concern Not Covered in the Spot Check**

- Lower Monumental downstream approach beginning approximately at buoy "58A" all the way to the guide wall.
  - Latest survey of this location in September 2002 indicated the need to dredge. This area was in the FY2003 dredging contract that was cancelled.
  - From the surveys, depths at MOP in this area range from 12.6'- 16' within the navigation channel boundaries.
- The area covering the confluence of the Snake and Clearwater Rivers.
  - Latest survey of this location in September 2002 indicated the need to dredge. This area was in the FY2003 dredging contract that was cancelled.
  - From the surveys, depths at MOP at the Port of Lewiston run as low as 10.6' at the upper end of the turning basin.
- Mouth of the Snake River and through out Ice Harbor Cut (McNary Pool). Snake River Mile 0-9.7
  - Latest surveys of this location in September 2002 indicate areas in Ice Harbor Cut that will require dredging.

CENWW-OD-TM

SUBJECT: Site Visit on Snake River

- At Snake River Mile 5+ the shallowest water depth at MOP in the channel is 13.5'. This area is to be added to the next dredging contract.
- At the downstream approach to Ice Harbor lock where the shallowest water depths at MOP is 11.5'. This area is to be added to the next dredging contract.

ANN GLASSLEY

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## EMERGENCY TMT CONFERENCE CALL

**17 April 2003      1500 - 1600 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

### AGENDA

1. [SOR #2003-8](#) (88kB) 
2. The call was requested by Dave Wills, chair of FPAC

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

**TECHNICAL MANAGEMENT TEAM  
CONFERENCE CALL NOTES**

**April 17, 2003**

**CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE  
PORTLAND, OREGON**

***1. Greeting and Introductions***

The April 17 Technical Management Team conference call to discuss SOR 2003-8 was chaired by Cindy Henriksen of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Henriksen at 503/808-3945.

***2. SOR 2003-8.***

On April 17, the action agencies received System Operational Request 2003-8. This SOR, supported by USFWS, IDFG, ODFW, WDFW and CRITFC, requests the following specific operations:

Limit flow fluctuations at Priest Rapids as described below:

- When Priest Rapids daily discharge is between 36 and 80 Kcfs, limit flow fluctuations to no more than 10 Kcfs in a 24-hour period.
- When Priest Rapids daily discharge is between 80 and 110 Kcfs, limit flow fluctuations to no more than 10 Kcfs in a 24-hour period.
- When Priest Rapids discharge is between 110 Kcfs and 140 Kcfs, limit fluctuations to no more than 20 Kcfs in a 24-hour period.
- When Priest Rapids daily discharge is between 140 Kcfs and 170 Kcfs, limit fluctuations to no more than 20 Kcfs in a 24-hour period.
- When Priest Rapids daily discharge is above 170 Kcfs, limit fluctuations to no more than 20 Kcfs in a 24-hour period.

The full text of this SOR is available via hot-link from today's agenda on the TMT homepage. Please refer to this document for full details and justification.

David Wills of the Fish and Wildlife Service spent a few minutes going through the specifics of the SOR, noting that its purpose is to minimize stranding and entrapment of Hanford Reach juvenile fall chinook, given the concern about increased fish losses this year.

CRITFC's Bob Heinith said Paul Hoffarth of WDFW is in the process of developing new Hanford Reach loss estimates based on the field crews' survey work last week; he added that the Alaska Department of Fish and Game is also sending a letter of support for this SOR because of the importance of this stock to the Alaska fishery. Heinith said he had been out on the Hanford Reach on April 12 with a party that included tribal representatives as well as a FERC

commissioner, and was amazed at the number of stranded fish he saw everywhere, with some entrapments as much as a third of a mile from the river. Researchers believe all of the fish in all but the largest of these entrapments die due to thermal stress and dewatering, he added. We're now heading into peak emergence, Heinith said; the majority of an estimated 35 million juvenile chinook will then be susceptible to stranding. With that in mind, Heinith said, we would really like to see the action agencies limit flow fluctuations from Priest Rapids.

Scott Bettin noted that Priest Rapids is not a federal project; the federal operators have no authority to implement the flow fluctuation limitations requested in SOR 2003-8. He added that the current forecast is for daily average flows at Priest Rapids of 110 Kcfs today, 100 Kcfs tomorrow, 90 Kcfs on Saturday, 70 Kcfs on Sunday and 110 Kcfs on Monday. He noted that power peaking at Grand Coulee and Chief Joseph actually helps limit flow fluctuations at Priest Rapids; however, Grant County PUD operates Priest Rapids, and it's up to them what comes out of that project. Frankly, he said, I'm not sure why we're having a TMT conference call to discuss this issue, given that fact. Bettin added that his understanding is that Grant County is unwilling to commit flow bands smaller than those stipulated in the current Hanford Reach Fish Protection Agreement.

Still, you could release more water from Grand Coulee, Heinith said -- that would help Grant County maintain higher Priest Rapids outflow. Bettin replied that another recently-received SOR, 2003-7, requests no additional flow for listed species at this time; releasing additional storage from Grand Coulee would conflict with SOR 2003-7. Heinith noted that CRITFC does not agree that the flow bands in this year's fish protection agreement are adequate; they are approximately twice as wide as the flow bands specified in SOR 2003-8.

It sounds as though CRITFC and the salmon managers feel this would be a better operation for fish, Silverberg said; however, it doesn't sound as though the TMT is really the place to come to resolution on this issue. Is there another avenue the salmon managers should pursue? Unless we get more flow out of the federal projects, Heinith replied, we won't have a basis from which to ask Grant County to implement this SOR.

What are your fish protection goals? Bettin asked. We want to minimize stranding and mortality in the Hanford Reach, Heinith replied. In the absence of specific objectives, said Bettin, it's hard to know how to respond. Grant PUD made it clear as recently as Wednesday's TMT meeting that they are unwilling to commit to any narrower flow bands than those in the Hanford stranding agreement, said Tony Norris; even if more water is released from Grand Coulee, Grant County is still going to fluctuate Priest Rapids outflow. He suggested that the salmon managers speak directly to Grant County PUD. We intend to, but we need the federal operators to agree to provide an adequate base flow from Grand Coulee before we approach Grant County, Heinith replied. If we release more water from Grand Coulee, the flow fluctuations at Priest Rapids will be even larger, Norris observed -- that will only make the problem worse.

Again, said Bettin, the implementation of this SOR is not within our control. And you're unwilling to increase the base flow from Grand Coulee? Heinith asked. Absolutely, Bettin replied -- it would contradict what SOR 2003-7 is asking Reclamation to do for listed fish. If you

won't increase the base flow from Grand Coulee, we won't have a basis from which to approach Grant County PUD, said Heinith. Again, I'm not convinced that increasing the base flow from Grand Coulee is going to solve this problem, Norris replied.

Paul Wagner suggested that a direct dialogue with Grant County PUD would probably be the most constructive way to proceed with this issue. Henriksen noted that, when flows from Grand Coulee are 70 Kcfs, there are no fluctuations at Priest Rapids – isn't that a more desirable operation, from a biological standpoint? It's the drop from 110 Kcfs to 70 Kcfs that strands and kills fish, Heinith replied. Norris observed that SOR 2003-8 makes no reference to operations at Grand Coulee.

Shane Scott noted that, while the action agencies are saying increased discharge from Grand Coulee would not help implement this SOR, Grant County is saying it is a base flow issue, and is pointing the finger back at the action agencies. It would be worthwhile if we could find out where the truth really lies, he said.

We're hearing loud and clear, then, that the action agencies are unwilling to implement this SOR, said Heinith; we'll take it up the food chain from here. Actually, what I'm hearing is that there is nothing the action agencies can implement in this SOR – it's a Grant County PUD issue, said Silverberg. However, if the action agencies increase the base flow from Grand Coulee, there will be no question that it is Grant County PUD's decision that is causing the stranding and mortality, Heinith said -- given the fact that they are facing a major FERC relicensing process, that would merit significant consideration on their part. However, the TMT would have done everything it can to prevent that stranding and mortality from occurring, Heinith said.

After a few minutes of further discussion, Heinith said he is willing to discuss this SOR with Grant County PUD, although in the absence of an agreement to increase base flows from Grand Coulee, those discussions are extremely unlikely to bear fruit. Henriksen reiterated that, if flows through the reach are higher, the flow bands at Priest Rapids would be even larger, under the Hanford Reach Fish Protection Agreement. If Grant County PUD says they're willing to implement SOR 2003-7 if the base flow from Grand Coulee is increased, would the federal operators reconsider their decision? Heinith said. If it can be done at no cost to us, we would be willing to release additional storage from Grand Coulee, Bettin replied – Grant County would probably need to send us some energy during the following week.

In response to a question from Silverberg, Wills said he would prefer to see flatter, but not increased, outflow from Grand Coulee. Scott said he would prefer to see Grand Coulee operated to meet its BiOp requirements. Steve Pettit said his understanding was that SOR 2003-7 would not require additional water from Grand Coulee. Wagner said NOAA Fisheries is not a party to this SOR because they have agreed to work with Grant County PUD through a separate process; that's why we convened a conference call with Grant last week, he said.

Given that clarification, said Silverberg, it sounds as though the only course of action left is to sit down with Grant County and see whether they would be willing to implement SOR 2003-7 with the flows that will be coming down the system, as Scott Bettin laid them out earlier

in today's conference call. And would it be physically possible for Grant County PUD to use the pondage at Priest Rapids and Wanapum to implement the SOR, given those flows? asked Michele DeHart. Yes, Bettin replied – basically, Grant County would need to provide 20 Kcfs from their pondage on Sunday in order to maintain a level flow on Saturday and Sunday.

It sounds, then, as though, from a technical standpoint, this SOR could be implemented without additional water from Grand Coulee, Silverberg said; in addition, the other salmon managers have said they do not want to see additional Grand Coulee storage used to implement this SOR. Given those facts, she said, it sounds as though a direct conversation between the salmon managers and Grant County PUD would be the logical next step. I'll try to set up a conference call tomorrow morning, said Wagner.

With that, the conference call was adjourned. Meeting summary prepared by Jeff Kuechle.

**TMT PARTICIPANT LIST**

**APRIL 17, 2003**

<b>Name</b>	<b>Affiliation</b>
Cindy Henriksen	COE
Rudd Turner	COE
Donna Silverberg	Facilitation Team
David Wills	USFWS
Paul Wagner	NOAA Fisheries
Bob Heinith	CRITFC
Tom Lorz	CRITFC
Shane Scott	WDFW
Steve Pettit	IDFG
Jim Litchfield	Montana
Scott Bettin	BPA
John Wellschlager	BPA
Michelle DeHart	FPC
David Benner	FPC
Margaret Filardo	FPC

# TECHNICAL MANAGEMENT TEAM

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**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

23 April 2003 1000 - 1500 hours

Double Tree Hotel-City Center, Spokane, WA

Conference call line: 509-358-7488

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## AGENDA

1. Welcome and introductions.
2. Vernita Bar Update, Chris Carlsen.
3. WMP Update, Finalization of the Spring/Summer Update, Action Agencies.
4. John Day Spill Pattern during lockages, Corps.
5. Fish Spill Status and Tracking, Laura Hamilton. [\[High 12hr Averages\]](#) (13kB)  (COE). [\[Exceedence Tracking\]](#) (15kB)  (COE).
6. Upper Columbia River Tribes: Chuck Lee, Jerry Marco
7. Review current system conditions.
  - fish migration status (NMFS, USFWS)
  - chum (ODFW, WDFG)
  - [reservoir operation](#), power system, water supply (61kB)  (QADJ results: [Case 1](#), (61kB)  (COE, BOR, BPA).
8. Review operations request [SOR 2003-7 \(revised\)](#) (103kB)  (COE).
9. Develop recommended operations.
10. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

# **COLUMBIA RIVER REGIONAL FORUM**

## **TECHNICAL MANAGEMENT TEAM**

April 23, 2003

### **FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS**

Facilitator: Robin Harkless

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.

#### **Welcome and Introductions:**

This week's TMT meeting was held in Spokane during the Lake Roosevelt Forum conference. Local members of the public and other attendees to the conference sat in on the TMT meeting and were able to comment and ask TMT members questions about their issues.

#### **Vernita Bar:**

Chris Carlson, Grant County PUD, gave his weekly update on Vernita Bar. The expected end of emergence is April 28. The information he shared for April 14-20 is posted on the TMT web site. Oregon and NOAA expressed concerns with fluctuating flows and stressed the importance of maintaining smooth flows for the fish. Paul Hoffarth, WDFW, reported on fish monitoring for the area and provided mortality and "at risk" data for the study area.

Cindy Henriksen, COE, reported on the TMT conference call that was held last Thursday, April 17, to discuss SOR 2003-8. The SOR called for minimizing fluctuations at Hanford Reach/Priest Rapids. Paul Wagner, NOAA Fisheries, also provided a follow-up email regarding Hanford operations, which he shared with the group. Weekend operations seemed to improve but week day operations became a concern. Paul's message expressed a hope that operations would improve throughout the week in the future.

**ACTION:** There will be a meeting in Seattle for discussions on Vernita Bar issues. Joe Lukas is the contact for this meeting. Paul Wagner will attend and report back to the TMT at the May 7 TMT meeting. Other TMT members are encouraged to attend.

#### **Public Comment:**

Questions were raised about the notification process for emergency TMT calls. Some members of the public would like to be notified of these emergency meetings and expressed concern that they were not aware of last week's TMT call. TMT acknowledged this concern and will discuss the issue at their next process meeting. Other public members said there has been an improvement and thanked the TMT for this.

**Water Management Plan:**

The Spring/Summer update will be finalized at the May 7 TMT meeting. It was noted that the update is very close to being final, so anyone with specific suggestions for changes/additions to the WMP should contact Scott Boyce from the COE as soon as possible, before May 7.

Kyle Martin, CRITFC, requested comments from TMT on CRITFC's document on an alternative to the WMP. There is a link on the TMT web site from the March 19 agenda; comments should be sent to Bob Heinith by Wednesday, April 30.

**John Day Spill Pattern:**

Cindy Henriksen, COE, reported that after the last TMT meeting at which the John Day spill pattern issue was raised, the COE and the Towboat Association reached agreement on how to improve safe navigation through the John Day locks. The captain of the towboat will call the operators to go to a flat spill pattern at night when the towboat enters or leaves the lock. This issue will be monitored and addressed again if flows drop to levels where a flat pattern may not be possible. Cindy reported that over the last two weeks, if any change occurred, it was an increase in spill. The duration of the change is only about 10 to 15 minutes.

The COE said there have been no reports that there is a navigation concern because of the ongoing Lower Granite RSW test.

**Fish Spill Status and Tracking:**

The COE provided a handout of the average 12-hour TDG percentage for April 15-21, as well as highlighting when and where there were TDG exceedances. Paul Wagner expressed appreciation for the COE's coordination with NOAA on Ice Harbor spill as there is a desire to spill to the gas cap as often as possible at this project. A suggestion was made to track which projects are being operated to the gas cap. Oregon said there has been improvement from last year and encouraged continuing coordination to get as close to the gas cap as possible.

**Upriver Tribal Issues:**

Deanne Pavlick and Chuck Lee from the Spokane Tribe, and Monty Miller from the Colville Tribe shared upriver Tribal issues and information with the TMT. For the Spokanes, elevation and water retention time are the most important concerns at Lake Roosevelt. Boat ramp access is critical in January and February for Kokanee fisheries and in August for recreation and cultural preservation. Access into the tributaries and Sherman Creek are very important for smolt collection. Net pen damage is also a concern, particularly just before the month of June. Studies show that high numbers of fish pass damaged nets which could also cause a problem for Lower river stocks. Deanne and Chuck stressed the Tribe's perspective that anadromous and resident fish are both important to the Tribes. Monty Miller, a project biologist for the Colville Tribes, explained cultural resource concerns at Lake Roosevelt and the reality of trade-offs for anadromous and resident fish.

**ACTION:** Deanne will email Cindy Henriksen the slides she presented today as well as a summary of specific requests from the upriver Tribes to TMT, which will be posted on the TMT web page.

**ACTION:** Shane Scott, WDFW, requested that Tribal concerns be shared with him as a TMT representative, specifically on chum issues. TMT expressed an interest in working with the up-river Tribes, continuing to build strong relationships, and maintaining a balance between Upper and Lower river needs.

**Current System Conditions:**

*Fish migration status:* Paul Wagner, NOAA, reported that juveniles at Lower Granite appeared to be at peak passage on April 22. The trends are similar to prior years in timing, but there are higher numbers of fish this year than previous years. He reported high numbers of adults at Bonneville.

**ACTION:** Paul will share a spill criteria list from NOAA with TMT at the May 7 meeting.

*Chum:* Dave Wills, USFWS, provided a handout of chum information for Hamilton and Hardy Creeks. He reported that there is a downward trend in emergence, and that the end of emergence will likely occur in the next two weeks. Shane Scott, WDFW, reported on the data collection being conducted jointly by Oregon and Washington in the Ive's Island area. The data showed a downward trend in Chinook but still some emergence for chum. The end of emergence date is not yet known.

**ACTION:** Shane will organize a seining field trip on Friday, May 2. Anyone interested in participating should contact him.

*Reservoir operations/water supply/power:* Cindy Henriksen, COE, briefly explained how the Q Adjust model works. The model showed a ~50/50 chance that Priest Rapids can maintain a weekly average flow of 135 kcfs through June and Grand Coulee will refill. The Priest Rapids operation will need to be continually monitored throughout the season. The mid-month water supply forecast shows a slight increase from before. The COE will continue to monitor snow pack and the May final forecast.

Bob Hallock, USFWS, reported that there will likely be an SOR for sturgeon operations at Libby toward the end of May. TMT requested a "heads up" memo of different options for this operation from USFWS as soon as possible. Libby is currently releasing 4 kcfs and is about 55' from full.

Grand Coulee is at elevation 1281.5'. Hungry Horse is at 3518.6' and filling 6/10' per day. Dworshak is releasing 16 kcfs. There is a projected increase in in-flows during the month of May at Dworshak. Lower Granite flows have dropped to about 63-65 kcfs.

**SOR 2003-7:**

Dave Wills, USFWS, presented the SOR to begin a ramp-up at Priest Rapids on April 21 to meet 135 kcfs on April 24. Then, maintain a weekly average of 135 kcfs at Priest Rapids through the end of June while refilling Grand Coulee by the July 4 weekend. CRITFC would like to see any extra storage available during this operation to be shaped

in the middle of May. Paul Wagner reported that this operation should coincide with steelhead passage and will help with the lower volume issues at Hanford Reach.

**ACTION:** The SOR will be implemented until May 7, when TMT will revisit the issue. Two typos within the SOR were noted, and will be corrected and added to the TMT web site. (Under Specifications, bullet 2 should read 80% instead of 85%; under Justification, the STP model run is from 4/15/03, not 4/08/03.)

**Next Meeting, May 7, 9am-noon:**

**Agenda:**

- Vernita Bar Update and Report from 5/1 Meeting (Chris Carlson, Paul Wagner)
- Report from Seining Field Trip (Shane Scott)
- Fish Spill Status and Tracking (Laura Hamilton)
- SOR 2003-7 Update (All)
- NOAA Spill Criterion (Paul Wagner)
- USFWS Memo on Upcoming Sturgeon Operations at Libby (Cindy Henriksen, Dave Wills)
- CRITFC Spring Treaty Fishery SOR (Kyle Martin)
- Current System Conditions
- Other

## Summary of 22 APR 2003 QADJ Model Runs

22-Apr-03

CASE 1: 135 kcfs at PRIEST RAPIDS AP2-JUN

**Assumptions:**

- \* Streamflows were adjusted to the April Final Water Supply Forecast and shaped 59 different ways based on observed historical runoff.
- \* Starting Elevations were the 15 April forecasted elevations from STP.
- \* Grand Coulee operates to meet 135 kcfs at Priest Rapids 15 Apr - 30 Jun. Coulee targets El. 1285, 1280, and 1278 in July, Aug 15, and Aug 30.
- \* Hungry Horse operates to VARQ, meets minimum flows at Columbia Falls, targets full in June, El. 3550 in July, El. 3545 Aug 15, and 3540 ft by 31 Aug.
- \* Brownlee operates to flood control elevations.
- \* Dworshak releases 15 kcfs in April, targets full in June, releases 13 kcfs in Jul - Aug for LWG and targets 1520 ft by 31 Aug.
- \* Libby operates on min flow (4 kcfs) or VARQ flood control Mar - Apr, conducts a sturgeon pulse operation in May and Jun, targets El. 2454 in July with minimum bull trout flow of 7 kcfs, targets El. 2449, and 2439 on Aug 15 and Aug 30.

**Results:**

Priest Rapids Meets Flow Objectives of 135 kcfs Apr2 - Jun:

Month	BiOp Target	No. Times Meeting Target out of 59 yrs	Average Flow for 59 Years (kcfs)
Apr2	135	59	136
May	135	58	142
Jun	135	59	140

Lower Granite Meets Flow Objectives of 89.1 kcfs in Apr - May, 76.2 kcfs in June and 50.5 kcfs in Jul - Aug:

Month	BiOp Target	No. Times Meeting Target out of 59 yrs	Average Flow for 59 Years (kcfs)
Apr2	89.1	11	74
May	89.1	32	90
Jun	76.2	36	82
Jul	50.5	6	41
Aug1	50.5	0	36
Aug2	50.5	0	28
<b>APR1-JUN *</b>	<b>84.9</b>	<b>5</b>	<b>81</b>

*\* For APR1 in all years: observed data for 1 - 13 April and short-term model results for 14 - 15 Apr were used. (This was done to compare results from last run for Apr 1 - Jun 30.)*

**Lower Granite meets threshold target for APR1-JUN (81.2 kcfs) in 35 of the 59 years.**

McNary Meets Flow Objectives of 220 kcfs in Apr2 - Jun and 200 kcfs in Jul - Aug:

Month	BiOp Target	No. Times Meeting Target out of 59 yrs	Average Flow for 59 Years (kcfs)
Apr2	220	5	204
May	220	14	213
Jun	220	9	204
Jul	200	0	159
Aug1	200	0	149
Aug2	200	0	134

Projects Refill by June 30:

Month	No. Times Meeting Target out of 59 yrs	Average Elevation on 30 Jun for 59 Years	Full
Libby	10	2451.3	2459.0
Hungry Horse	59	3560.0	3560.0
Grand Coulee	27	1283.8	1290.0
Dworshak	59	1600.0	1600.0

Note: Grand Coulee operates to meet Priest Rapids flow of 135 kcfs Apr2 - Jun.



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**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## EMERGENCY TMT CONFERENCE CALL

**30 April 2003      0900 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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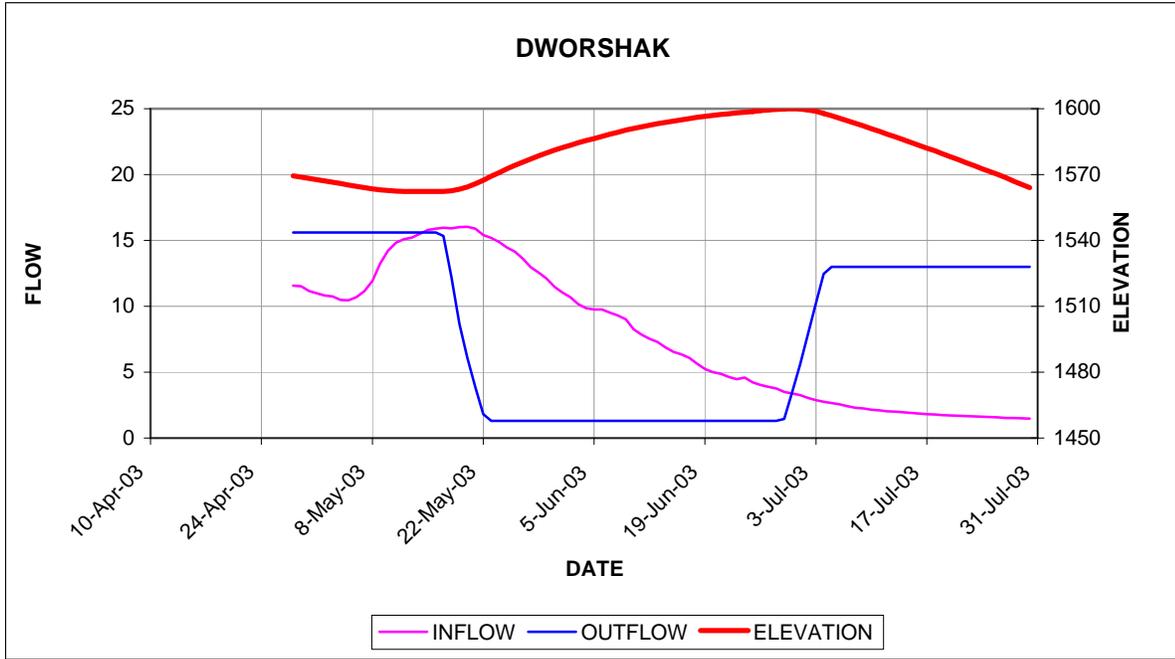
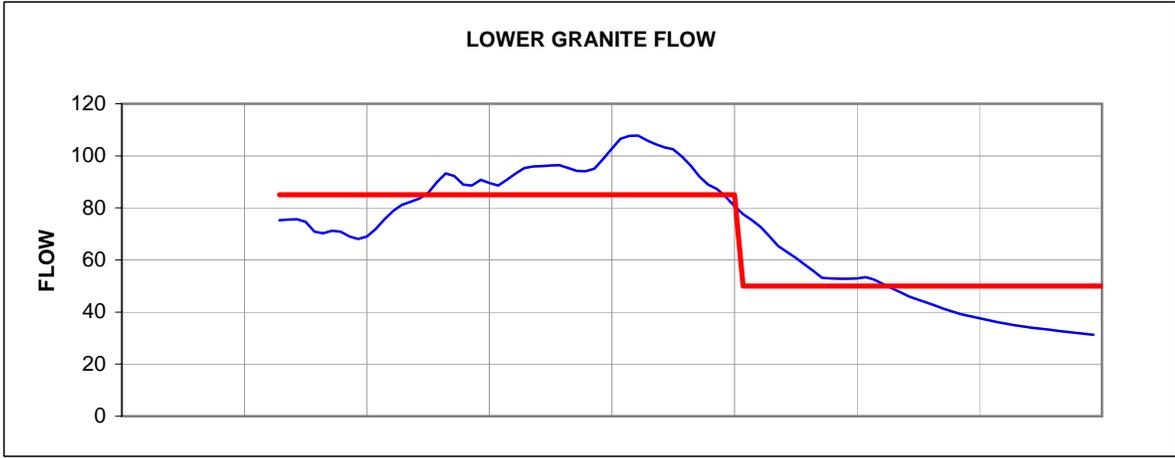
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### AGENDA

1. [SOR #2003-9](#) (150kB)  [Reservoir operation](#) (12kB)  (COE).
2. The call was requested by BPA.

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

STP 4/29/03



# TECHNICAL MANAGEMENT TEAM

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**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**07 May 2003      0900 - 1500 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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## AGENDA

1. Welcome and introductions.
2. Vernita Bar Update and Report of May 1 Meeting (Chris Carlsen/Paul Wagner)
3. Final WMP Spring / Summer Update (Action Agencies) [\[Final draft\]](#) (280kB) 
4. Fish Spill Status and Tracking (Laura Hamilton) [\[High 12-hr\]](#) (15kB)  [\[Exceedence Tracking\]](#) (15kB) 
5. [SOR 2003-7 \(revised\)](#) (103kB)  Update (All)
6. [SOR 2003-9](#) (88kB)  Update (All)
7. NOAA Spill Criterion (Paul Wagner) [\[Transport Criteria\]](#) (11kB) 
8. USFWS Memo on Upcoming [Sturgeon Operations](#) (16kB)  at Libby (Cindy Henriksen, Dave Wills)
9. CRITFC Spring Treaty Fishery SOR (Kyle Martin) [\[SOR 2003-C1\]](#) (16kB) 
10. Review current system conditions. [\[DWR\]](#) [\[HGR\]](#) [\[LIB\]](#)
  - fish migration status (NMFS, USFWS)
  - chum (ODFW, WDFW)
  - [reservoir operation](#), power system, water supply (COE, BOR, BPA)
11. Review [operations requests](#).
12. Develop recommended operations.
13. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

# **COLUMBIA RIVER REGIONAL FORUM**

## **TECHNICAL MANAGEMENT TEAM**

May 7, 2003

### **FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS**

Facilitator: Donna Silverberg

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

#### **Vernita Bar:**

Chris Carlson, Grant County PUD, gave an update on Priest Rapids operations and fish monitoring for the last two weeks. End of emergence occurred on April 27 based on biological criteria set out in the Vernita Bar settlement agreement. The information he shared is posted on the TMT web site and was distributed in handouts at the meeting.

Paul Wagner, NOAA, reported on a meeting with the Vernita Bar parties (Feds, States, Tribes and PUD's) that was held May 1 to discuss the possibility of adding an article to the FERC license about Grant PUD's fry emergence protection program. WDFW offered an alternative proposal, which takes a more conservative approach to Priest Rapids operations. Grant County was not willing at this point to adopt the proposal, as the difference between the proposal and the current program was too great. Data is being collected and may be part of future negotiations. Though the group did not reach agreement on this, Paul reported that Grant County will move forward with their license process and open the proposal up for comment.

#### **Water Management Plan Spring/Summer Update:**

The WMP Spring Summer Update is nearly final. A suggestion was made to change the "Hanford Reach Agreement" section to "Hanford Reach Operating Plan" to better reflect the latest discussions on this issue. Also, CRITFC (and any other) comments will be appended to the Update and posted on the web.

#### **Fish Spill Status and Tracking:**

Laura Hamilton, COE, reported that there have been 22 TDG exceedances during the past two weeks, due to: high TDG levels from the Mid-Columbia, 'best professional judgment', requests from fish managers, lack of information, and environmental uncertainties.

Cindy Henriksen explained that the COE reads the Biological Opinion as spill *up to* the gas cap and consider gas standards as the absolute cap. Thus, the COE operates to stay at or below the gas cap. The Salmon Managers agreed in the desire to meet state and federal water quality standards. However, as expressed in a letter signed by NOAA, Washington, Oregon, Idaho, USFWS and CRITFC, they would like to see the COE take a more aggressive approach in reaching the gas cap as often as possible.

**ACTION:** Paul Wagner will make a site visit to the RCC to observe the process for implementing spill and monitoring TDG. State fish managers will coordinate with their water quality counterparts regarding the desires expressed in the letter. There will be an update at a later TMT meeting on internal discussions between state representatives and Paul's site visit.

**SOR 2003-7:**

The Action Agencies will make efforts to continue to meet 135 kcfs flow at Priest Rapids for the next two weeks and continue to consider refill of Grand Coulee as the first priority. This issue will be revisited at the May 14<sup>th</sup> TMT meeting.

**SOR 2003-9:**

An emergency TMT meeting was held last week to discuss SOR 2003-9 regarding flows out of Dworshak. At the meeting, members agreed to meet the request and revisit the issue at today's meeting. Given the most recent data for volumes at Dworshak (based on the COE's May final forecast), the Action Agencies pointed out that there may only be enough water in the system to continue the operation for 10-17 days. Dave Statler, Nez Perce Tribe, agreed at Tuesday's FPAC meeting to support maintaining the current operation (~15 kcfs outflows) for another week, but expressed interest in considering future consequences when making management decisions. Jim Litchfield, Montana, agreed and suggested the group consider ramping outflows down sooner to ensure that there is remaining water in June. Idaho, Oregon, Washington, NOAA and USFWS continued to support the proposal in the SOR, due to the large number of fish observed in the system.

**ACTION:** SOR 2003-9 will be carried out for the next week. The Action Agencies expressed concern that the operation may affect refill and June flows. The Salmon Managers are monitoring the issue closely, will revisit it at the next FPAC meeting, and TMT will revisit Dworshak operations on May 14.

**NOAA Spill Criteria:**

Paul Wagner presented a memo to TMT from NOAA that listed criteria to consider when making spill/transport decisions. He highlighted that there is no specific trigger given the current data set, but noted that studies are underway that will aid in making transport decisions in future years. Criteria included:

- The trend in the water supply forecast;
- The trend in runoff;
- Environmental conditions;
- Fish conditions;
- Species composition;
- Status of information; and the following added during today's discussions –
- Runoff in the two river systems.

**USFWS Memo on Sturgeon Operations at Libby:**

Steve Olhausen, USFWS, spoke about the memo that serves as a “heads up”, per request from TMT, to a possible future SOR for sturgeon operations at Libby. The SOR should be out in the next two weeks. Steve suggested that additional questions be directed to Bob Hollock.

**SOR 2003-C1: CRITFC Spring Treaty Fishery:**

Kyle Martin, CRITFC, shared information on the SOR presented after the April 23 TMT meeting, for operations from April 24-26 to support a tribal fishery. The operation was implemented. Kyle said there may be one more fishery this season and he will try to distribute any requests from CRITFC to the TMT as soon as they are available.

**Current System Conditions:**

*Chum:* Shane Scott reported on the status of chum, saying there will be a revised emergence date at the next TMT meeting. He reported that emergence is decreasing and would like to schedule a seining field trip (last week’s trip was postponed) as soon as possible. A Washougal frye release (of over 100,000!) is expected into Duncan Creek next week.

*Reservoir Operations:* Grand Coulee is at elevation 1276.4’; Hungry Horse is at 3526.5’ and releasing 5600 cfs out; Libby is at 2414’ and filling slightly; and Dworshak is at 1567’ and drafting.

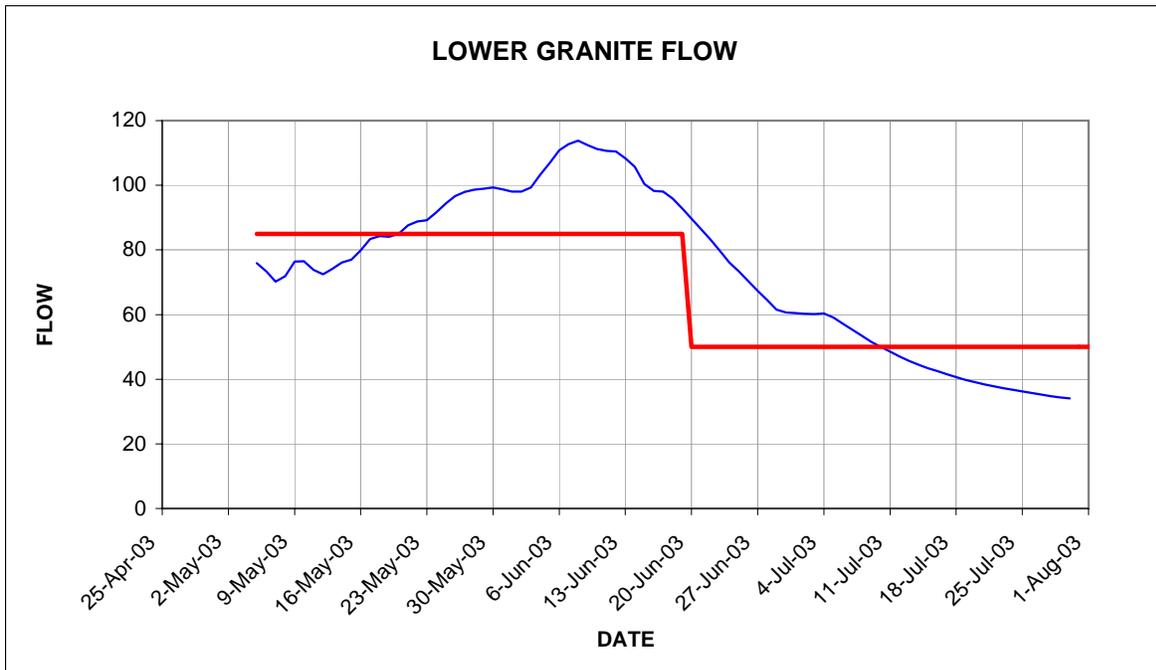
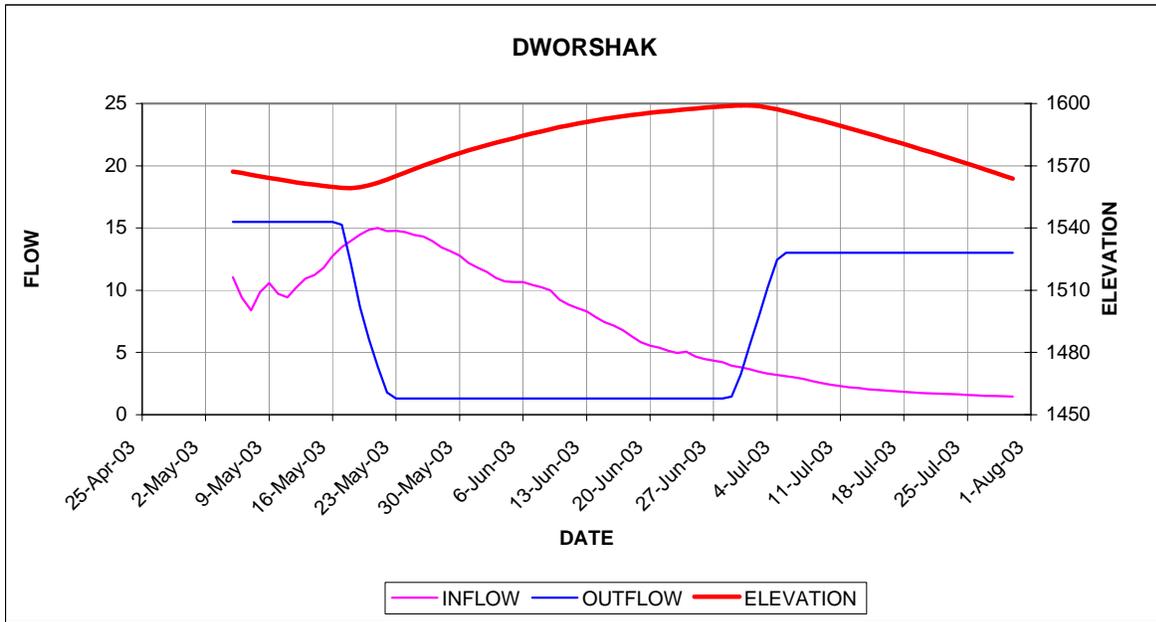
*Power:* Scott Bettin reported on a number of power outages throughout the system on Monday. Everything is now “back to normal”.

**Next Meeting, May 14, 9am-10:30am:**

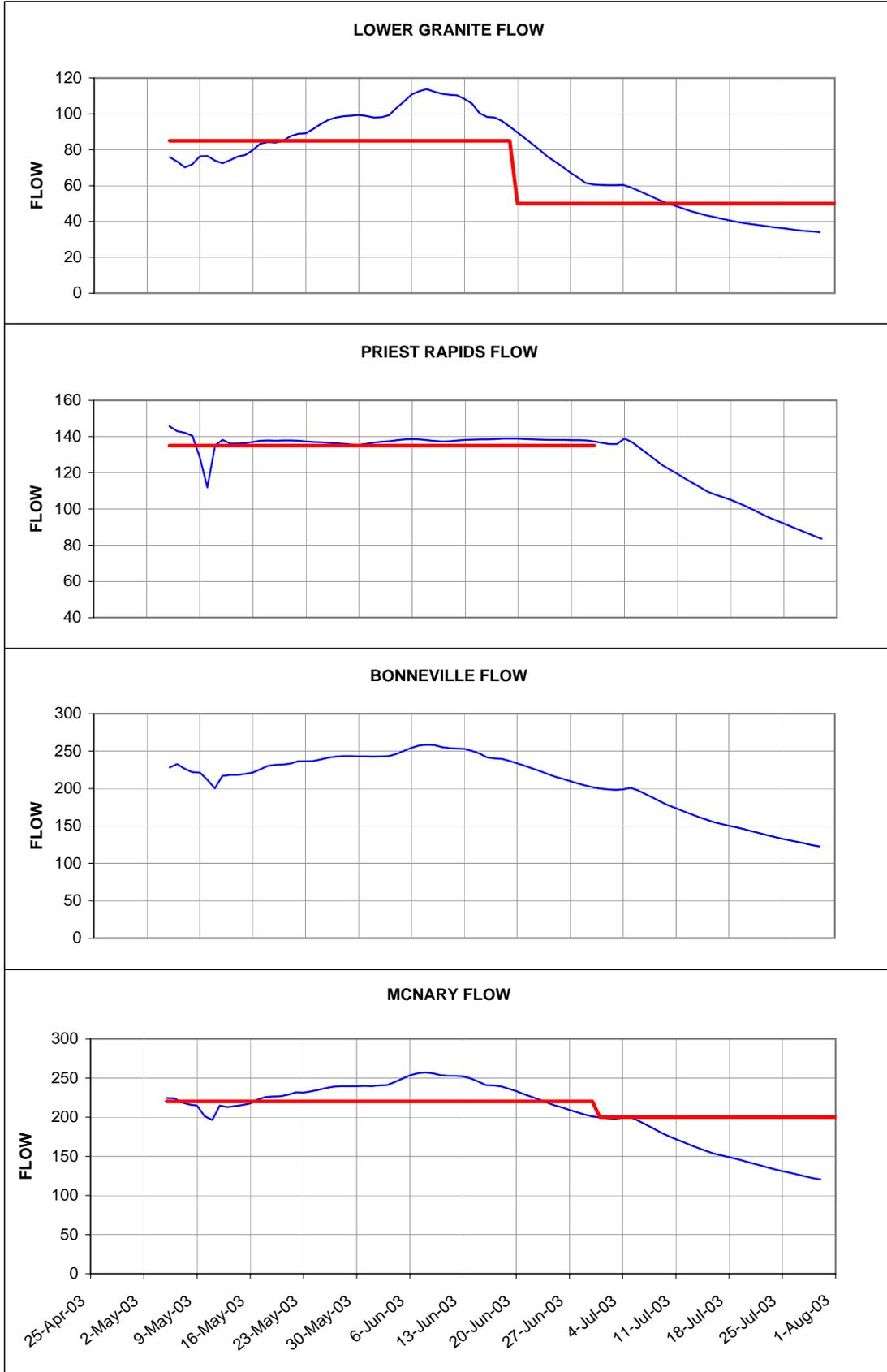
Agenda:

- SOR 2003-7 Priest Rapids operations
- SOR 2003-9 Dworshak operations

STP Run 06 May 03



STP Run 06 May 03





# United States Department of the Interior

## FISH AND WILDLIFE SERVICE

Memorandum to the File:

April 29, 2003

Earlier in the year we were not anticipating enough runoff above the Libby Project for even a minimum sturgeon augmentation flow. It now appears that there may be something near 0.8 MAF available for sturgeon while also fulfilling the needs of bull trout and anadromous fish. Because of the relatively small quantity of water, the length of the incubation period (approximately three weeks), variation in spawning timing, and the limited release capacity at Libby Dam, we are thinking that the best use of the water this year is for augmentation during the egg incubation / yolk-sac-fry stage. The dilemma is, which set of eggs / fry should be favored?

In an effort to cause sturgeon to spawn over suitable rocky substrates some sturgeon expected to spawn this spring will continue to be captured, radio tagged, and transported to the Hemlock Bar area, about 10 miles upstream of Bonners Ferry. Two males have already been transported to this area, and they have remained in the vicinity. Additional males and females will be transported soon. This area is characterized by rocky substrates and high water velocities, and it is believed suitable for sturgeon spawning / incubation. If the "net and haul" fish remain in the Hemlock Bar area, or at least over gravel substrate above Bonners Ferry and they spawn, augmentation flows would be timed to provide for incubation of their eggs / yolk-sac-fry. A specific system operation request would be timed based on the abrupt downstream movement of those transported females, an indicator that spawning has just occurred.

From past experience during a relatively low water years we can anticipate that most sturgeon in the river environment will spawn early, perhaps even during late May. While we may be able to bracket the start date based on the timing of eggs collected below Bonners Ferry, the actual request is likely to have little lead time. If we are to reliably gain advantage in terms of water velocity to exclude predation for released eggs from these radio tagged-transported females we will need to react quickly - after the first female spawns. We can expect an 18 to 20 hour lag time for enhancement flows from Libby Dam to reach the Hemlock Bar area. Further, the warmest available water from Lake Koocanusa would be requested to avoid disruption of spawning behavior by other transported sturgeon. Adjustments in the selective withdrawal system for temperature control may also be guided by evidence of spawning in the river below Bonners Ferry. This will require close in-season coordination.

If none of these net and haul female sturgeon remain to spawn over a gravel substrate above Bonners Ferry, emphasis would shift to augmenting flows for releases of large numbers of four-day-old larvae from the Kootenai Tribe's Hatchery. We would expect a delay of two to three weeks after peak spawning in the wild before hatchery larvae would become available. Thus, the augmentation flow request would be delayed two or three weeks. We estimate that hatchery spawning may occur in the last half of June with 4 day old larvae becoming available near the first of July. However, under this alternative the hatchery managers will be able to provide us with more precise advance notice of when larvae will be available.

When better information becomes available we will provide a specific system operation request based upon one of these scenarios.

**Criteria to consider for providing spill or terminating spill at Lower Snake River below average runoff volume years.**

There was a good deal of discussion in the Regional Forum Process (April 2, 2003 TMT meeting and April 3, 2003 IT meeting) regarding whether spill should be provided this year at the Lower Snake River projects. The discussion focused on Action 40 of NOAA Fisheries 2000 Biological Opinion of the FCRPS which reads:

The Corps shall continue to transport all non-research juvenile salmonids collected at the Snake river collector projects. The Corps and BPA shall continue to implement voluntary spill at all three Snake river collector projects when seasonal average flows are projected to meet or exceed 85 kcfs.

The narrative in the BiOp expanding on this action states: "If new information shows that survival through inriver migration, including returning fish to the river, is beneficial, these data will be reviewed and discussed during the annual planning process. In particular, BPA and the Corps, working with NMFS through the annual planning process, have to consider the scientific basis for the 85-kcfs voluntary spill trigger. Any resulting changes in the annual transport operations will be formalized through the consultation framework or a similar process."

The original basis for the less than 85 kcfs figure was that it represented the low end of the range of the sliding scale of the Snake River's seasonal flow objectives. It assumed a substantial benefit would be provided by transporting fish relative to leaving them inriver when flows were less than 85 kcfs. However, the uncertainty that 85 kcfs was the figure at which this "substantial" benefit would accrue is reflected in the narrative statement of the need, "to consider the scientific basis for the 85 trigger". The current information available from transportation research does not support or refute a definitive flow breakpoint.

Given existing information and a water year which was projected to be very close to the 85 kcfs seasonal average this year, NOAA Fisheries believes the following considerations should be weighed in deciding whether to provide spill or maximize fish collection and transportation.

1. The trend in the water supply forecast. Has it been steady, increasing, or decreasing? If the water supply demonstrates a decreasing trend across months and runoff forecasts are continually being adjusted downward, a decision to maximize transport would likely be favored.

Conversely, if the water supply forecasts are increasing through the season and forecasts are steady or increasing, a balance between transportation and inriver passage would be favored.

2. The trend in runoff. If the runoff came early in the season (March/early April) due to a rain on snow event, and the migration season would likely experience a trend of flows below 85 kcfs and decreasing through the migration season, a decision to maximize transport would be favored.
3. Environmental conditions. If river temperatures remain favorable for inriver passage, a balance between inriver and transportation would be favored. Laboratory information suggests that steelhead may revert to parr if they are exposed to water temperatures in excess 12.5C for about 20 days.
4. Fish condition. If fish arriving at the collector projects are showing signs of poor condition or a loss of condition factor at a rate disproportional to prior years, an emphasis on transportation should be considered.
5. Species composition. The mix of all species that would be affected by the decision should be considered. While some species and life stages may benefit from a maximum transportation decision at particular times in the season, that decision may have an adverse affect on other species.
6. Status of information. Studies are underway that should provide additional information on this issue. Transport study conditions in 2002 were very similar to flow conditions being experienced this year. Although this information will not be available this year, it will be used in decisions of this nature in future years.

# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

14 May 2003      0900 - 1000 hours

Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. Fish spill status and tracking. (COE)  
[\[High 12hr Averages\]](#) [\[Exceedence Tracking\]](#)
3. Update [SOR 2003-07 \(revised\)](#) (103kB)   
Volumes: [\[LIB Apr-Jun\]](#) [\[LIB Apr-Jul\]](#) [\[HGH Apr-Jun\]](#) 
4. Update [SOR 2003-09](#) (88kB) [\[DWR Apr-Jun\]](#) [\[Reservoir operation\]](#) 
5. Develop recommended operations.
6. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

# **COLUMBIA RIVER REGIONAL FORUM**

## **TECHNICAL MANAGEMENT TEAM MEETING NOTES**

**May 14, 2003**

**CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM  
HOUSE  
PORTLAND, OREGON**

**TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>**

### FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Donna Silverberg

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

#### **SOR 2003-7:**

Dave Wills, USFWS, gave an update on SOR 2003-7, regarding outflows from Priest Rapids and refill of Grand Coulee (the SOR is linked to the TMT agenda on the web page) presented on May 7. FPAC requested that the current regime continues and flows be operated to as close to 135 kcfs as possible in order to stretch the flows for a longer period of time. The Salmon Managers' justification for this request is that the freshet is late this year, showing a similar pattern to 1999 and there remains a need for higher continuous flows for late emerging outmigrants from the Snake and Mid-Columbia.

Rudd Turner presented graphs of Libby April 30-June 1 volume projections based on the May final water supply forecast.

**ACTION:** Action Agencies will let Salmon Managers know if any threat to Grand Coulee refill arises. They believe the 135 request can be met for the next two weeks.

#### **SOR 2003-9:**

Dave Wills reported that FPAC's most recent information concludes that the current Dworshak operation as expressed in SOR 2003-9 (linked to the TMT agenda on the web page) should continue for another week. The Nez Perce Tribe concurred with this conclusion. BPA expressed concerns with putting “all eggs in one basket”, suggesting that there be some back up in case the runoff expected does not occur. If it does not, then refill and summer flow augmentation may be impacted. FPAC shares BPA's concerns and has had extensive discussions over this. Still, the Salmon Managers would like to continue with the operation because of the large salmon run.

The COE presented an alternative operation: 15.5 kcfs through 5/23, then ramp down to 10.5 on the 24<sup>th</sup>, 7.5 on the 25<sup>th</sup>, 3.5 on the 26<sup>th</sup>, and 1.5 beginning on the 27<sup>th</sup>. BPA

suggested a slower ramp down beginning 5/20 to save some water for later: 5/20 (12 kcfs), 5/21 (10), 5/22 (8), 5/23 (6), 5/24 (4) and 5/25 (1.5).

**ACTION:** Operations at Dworshak will continue as they are (~15.5 kcfs) for the next week. The Salmon Managers will consider the preferred ramp down rate. TMT will revisit the operation at the May 21<sup>st</sup> meeting. TMT will discuss DWR operations before then if flows or weather change from predicted conditions.

**Chum Emergence:**

Shane Scott, Washington, reported that the end of emergence below Ive's Island is expected around May 15. He also reported on the brood stock collection numbers – 221,836 total including 13,500 from Duncan Creek. 56,000 were released on May 8; the remaining will be released next week.

The COE would like to remove or soften the tailwater restriction at Bonneville when chum emergence is complete in order to support the Priest Rapids operation.

**ACTION:** Shane will check on flows out of Hamilton Creek and their connectivity to the tailwater at Bonneville, as well as how many remaining Chinook redds there are, and how deep they are. He will communicate the information to TMT in the next 24 hours, and if neither issue conflicts with removing the tailwater restriction, it will be removed.

**Next Meeting, May 21, 9am-noon:**

**Agenda:**

- SOR 2003-7 Priest Rapids Operations Update
- SOR 2003-9 Dworshak Operations Update
- TDG Monitoring Visit – NOAA
- Transport Criteria – NOAA
- Summary of Tribal Fishery – CRITFC
- Tailwater Operations Below Bonneville Update
- Sturgeon Operations at Libby Update

\***NOTE:** *Future meetings are scheduled for: June 4, 18; and July 2, 16, and 30.*

## **Meeting Minutes**

### ***1. Greeting and Introductions***

The May 14, 2003 Technical Management Team meeting was chaired by Rudd Turner of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Cindy Henriksen at 503/808-3945.

### ***2. Update on SOR 2003-7 (Revised), The Libby Volume Forecast (April-June and April-July) and the Hungry Horse Volume Forecast.***

SOR 2003-7, received by the action agencies on April 17, covered operations at Priest Rapids, McNary and Grand Coulee Dams. The requested operation has been going forward over the past several weeks. Wills said this SOR was discussed at yesterday's FPAC meeting; at that meeting, the salmon managers agreed that the 135 Kcfs average flow at Priest Rapids be maintained for as long as possible while still ensuring Grand Coulee refill by the July 4 weekend (actual refill of the project will likely occur on June 30). Any additional water over and above that needed to refill Grand Coulee should be shaped into this period, said Paul Wagner; if there isn't any additional volume, however, we should hold the Priest Rapids flow as close to 135 Kcfs as possible in order to prolong the period of 135 Kcfs average flow. Wagner explained that the freshet is somewhat delayed this year, which means a protracted outmigration is likely, hence the request to prolong the period of 135 Kcfs Priest Rapids outflow as long as possible.

Just so it's clear, Grand Coulee refill is the highest priority; if refill starts to be jeopardized, it should take precedence over the Priest Rapids operation? John Wellschlager asked. That's correct, Wills replied.

The group looked at the most recent flow and fish passage information on the DART homepage; Wagner noted that this water year will likely produce peak Lower Granite outflow some time in the last week in May. The peak of the Snake River outmigration can be expected to arrive at the Lower Columbia projects about eight days later, Wagner said. Mary Karen Scullion said that, according to the most recent Corps STP modeling, it should be possible to maintain the 135 Kcfs average flow at Priest Rapids through about June 10 and still refill Grand Coulee by June 30.

Turner directed the group's attention to the most recent Corps volume histograms for Libby, Dworshak and Hungry Horse. He noted that both of the Libby histograms include a sturgeon pulse; one shows the period April 1-June 30; the other shows the April 1-July 31 period. For the first run, there is virtually no augmentation volume in addition to sturgeon volume available if a 50% confidence of refill is assumed; under the second run, again assuming 50% confidence of refill, there would be 561 kaf (283 ksf) available for summer flow augmentation. What you're saying here is that it is unlikely that Libby will refill by June 30 this year? Boyce asked. Correct, Turner replied. And that flow augmentation volume is in addition to the 7 Kcfs bull trout flow in July? Wagner asked. Correct, Turner replied.

In terms of a resolution on this operation, then, it sounds as though the action agencies will maintain Priest Rapids average flow as close to 135 Kcfs as possible, and will keep everyone informed as to when jeopardy to Grand Coulee refill is imminent, Wellschlager said. I think we're fine for the next two weeks, however, in terms of maintaining the 135 Kcfs at Priest Rapids, Tony Norris said.

### ***3. Update on SOR 2003-9.***

SOR 2003-9, received by the action agencies on April 29, requested that the current Dworshak outflow of 15.5 Kcfs-16 Kcfs be maintained until the spring BiOp flow target of 89 Kcfs is reached at Lower Granite Dam. Turner reminded the group that there

was agreement at last week's TMT meeting to continue with the current Dworshak operation at least until it could be revisited at today's meeting.

At yesterday's FPAC meeting, we crunched various numbers, said Wills; based on the information we have right now, with the River Forecast Center now predicting a 2.34 MAF runoff volume at Dworshak, we believe the current Dworshak operation can continue for at least the next week. We feel that, with the snowpack that has accumulated in the past month alone, we can continue the operation for a week without jeopardizing June 30 refill at Dworshak, he said. Kyle Martin said CRITFC and the Nez Perce Tribe concur with this analysis.

Wellschlager reiterated BPA's concern that the salmon managers are putting all of their eggs in one basket; our preference would be to back off flows slightly at this point to build some insurance later in the spring period, he said. We're right on the edge, said Wellschlager; we may have another 10 days left at 15.5 Kcfs outflow from Dworshak before we have to reduce outflow to project minimum discharge and pull the rug out from under the outmigration. Martin replied that according to the weather forecast information he has seen recently, the freshet should begin as soon as next week. The salmon managers discussed this extensively yesterday, Wagner replied; while we share the action agencies' concern, the consensus was that this operation should continue for another week.

Turner said that, according to the most recent Corps STP run, which he said is somewhat conservative, it should be possible to hold 15.5 Kcfs out from Dworshak through May 23. After that, he said, we would likely ramp down to 10.5 Kcfs on Saturday, May 24, then to 7.5 Kcfs on May 25, 3.5 Kcfs on May 26, 1.5 Kcfs starting May 27. That gives us a few more days at 15.5 Kcfs, Turner said, but I must echo BPA that the salmon managers are really taking the forecast literally. Actually, we're hoping for more from the forecast, said Wagner.

What will happen to the smolts if the flows drop dramatically for two days, then come back up – how long can they weather a reduction in Lower Snake flows without seeing a significant biological impact? Wellschlager asked. Such an operation would delay their migration, increasing their travel time and reducing overall survival to some degree, Boyce replied. The problem is that we have high migration numbers currently in the river, and now is not the time to drop flows – we're trying to bridge the gap between the current relatively low flows in the Lower Snake and the beginning of the natural runoff begins, said Boyce.

There are still a large number of listed wild outmigrants in the Salmon River, Wagner added – a large percentage of the populations of concern are still upriver. Both NMFS and IDFG are predicting a record wild chinook and steelhead outmigration this year, said Boyce – it is crucial to keep flows up as long as we can. In response to a question from Wellschlager, Wagner said approximately 50% of the expected 2003 yearling chinook run is thought to have passed Lower Granite to date. Boyce added that, because of the fact that the Lower Granite RSW is believed to be very effective at passing fish, it's hard to say what the cumulative passage graph will look like from here on out.

Wellschlager asked whether the salmon managers would consider a longer rampdown period – perhaps a week, rather than the currently-planned four days. Let’s discuss that at our May 21 meeting, Wills replied. That discussion will likely be about the rampdown, because we’ll be almost out of water at that point, said Turner. If the salmon managers do contemplate extending the period of high flow from Dworshak at the cost of greater risk to Dworshak refill, Turner said, the Corps will need written support from NOAA Fisheries to increase refill risk.

Wellschlager added that, while the salmon managers are within their rights to request the continued 15.5 Kcfs outflow from Dworshak, he also has an obligation to represent Bonneville’s ratepayers, whom the spill at Dworshak is costing \$1 million per week. Wagner noted that the current Corps STP run assumes a runoff volume of 1.9 MAF at Dworshak, rather than the 2.34 MAF predicted in the current River Forecast Center runoff volume forecast. Boyce said the salmon managers will discuss Wellschlager’s suggestion of a more protracted rampdown at their Tuesday FPAC meeting and will discuss the operation with the action agencies on Tuesday afternoon. It may then be possible to begin ramping down Dworshak outflow beginning May 21. The TMT will meet next Wednesday to discuss that operation.

#### ***4. Recommended Operations.***

Turner said the Corps will continue the current Dworshak operation at least until next Wednesday’s TMT meeting, unless conditions change drastically. If conditions do change, said Turner, we will convene a TMT conference call.

#### ***5. Chum Update.***

Shane Scott said he had promised to bring a new estimate of the chum emergence date for the chum below Ives Island. The new estimate is May 15, he said. Also, said Scott, there was a program to collect broodstock from the Ives Island spawning grounds and rear those fish as a protected group at Washougal Hatchery; 221,000 fry were produced from the eggs collected this year, including just under 14,000 from the Duncan Creek spawning channels that dried out after spawning. On May 8, 56,000 of those 221,000 chum fry were released from the Skamania Landing boat launch; the remaining fry will be released next week.

So your estimate is that chum emergence will be finished by May 15? Turner asked. Yes, Scott replied. Given that fact, said Turner, the Corps would like to remove the current tailwater restriction below Bonneville once emergence is complete. The problem is that we’re still seeing significant numbers of emerging chinook, Boyce replied. The hard constraint is to protect chum, said Turner; we have no directive to protect chinook, and my understanding is that those fish are being produced from deeper redds. We can check the location of the chinook redds and get back to you, said Scott. Relaxing the Bonneville tailwater restriction will give us more flexibility to meet the 135 Kcfs average flow at Priest Rapids, Wellschlager added. I don’t think it would be an issue for chinook, said Turner; Bonneville tailwater is unlikely to fall below 11.5 feet even over the coming weekend. After a brief discussion, it was agreed that Boyce and

Scott will talk to their field personnel; Scott will provide a response to Turner's request via email by tomorrow.

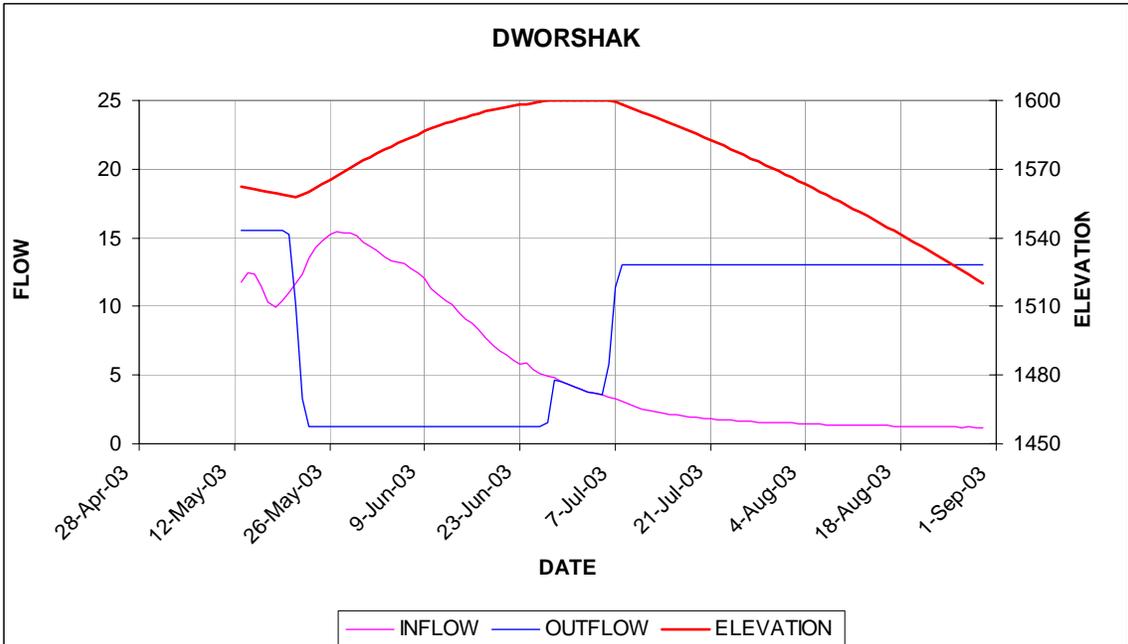
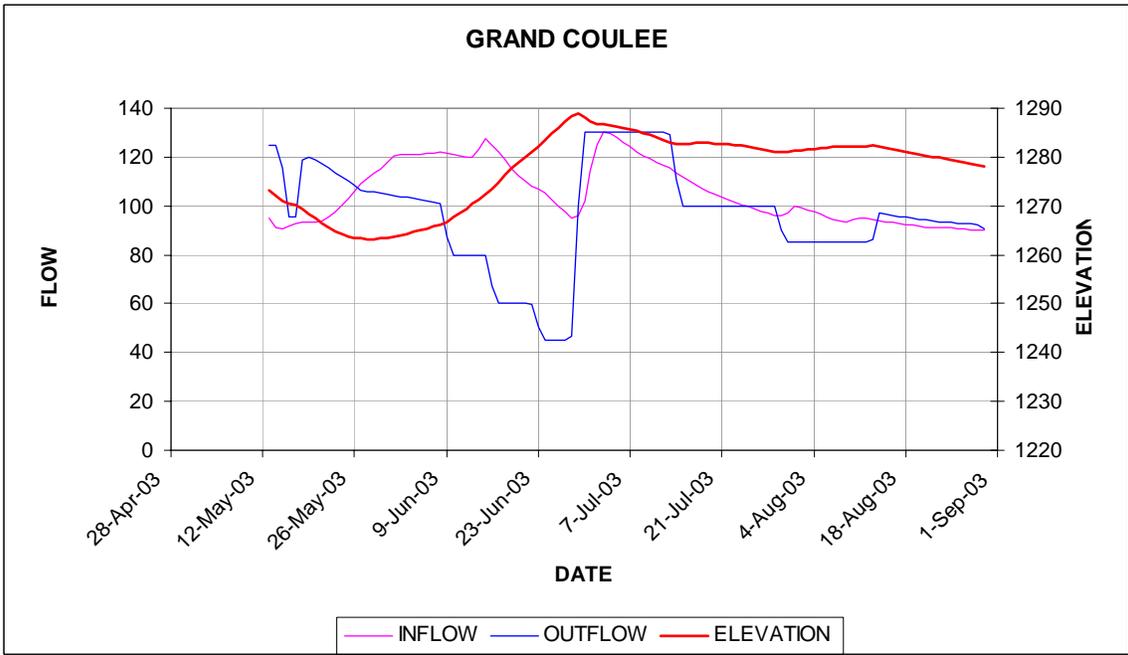
**6. Next TMT Meeting Date.**

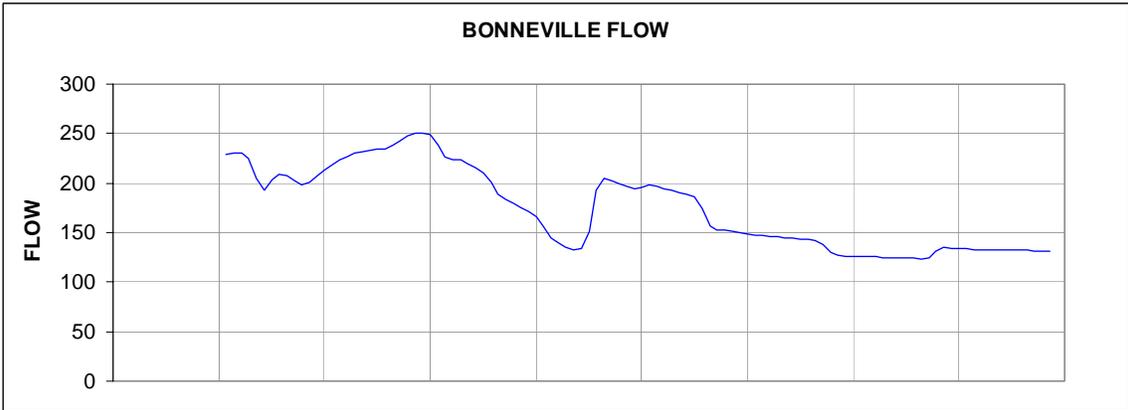
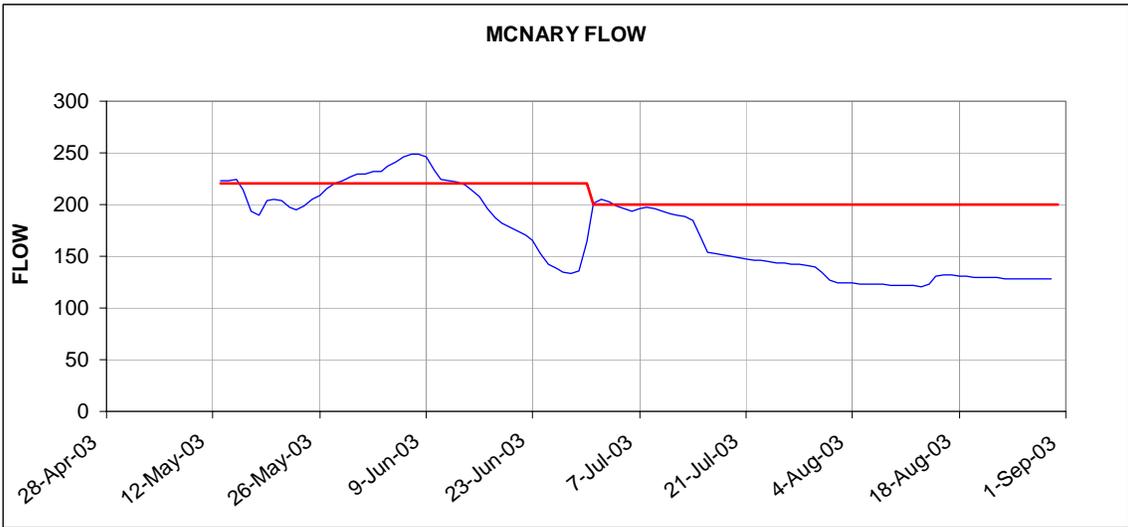
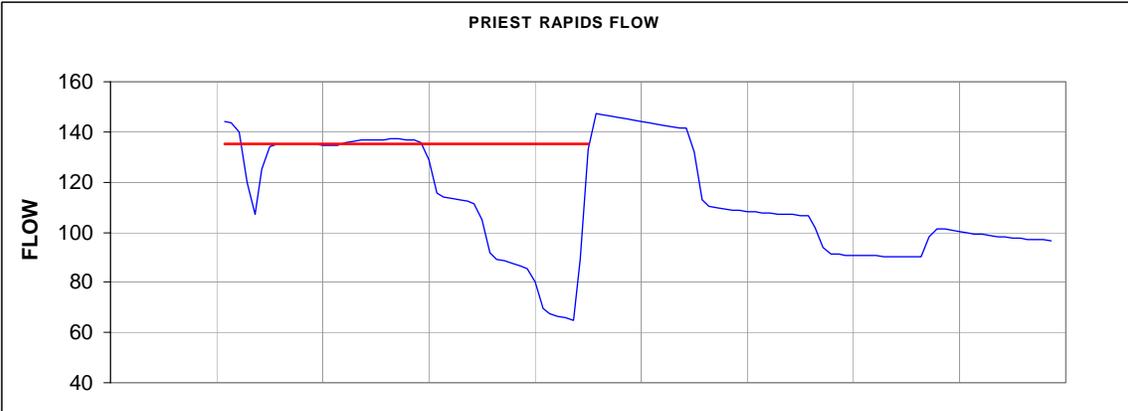
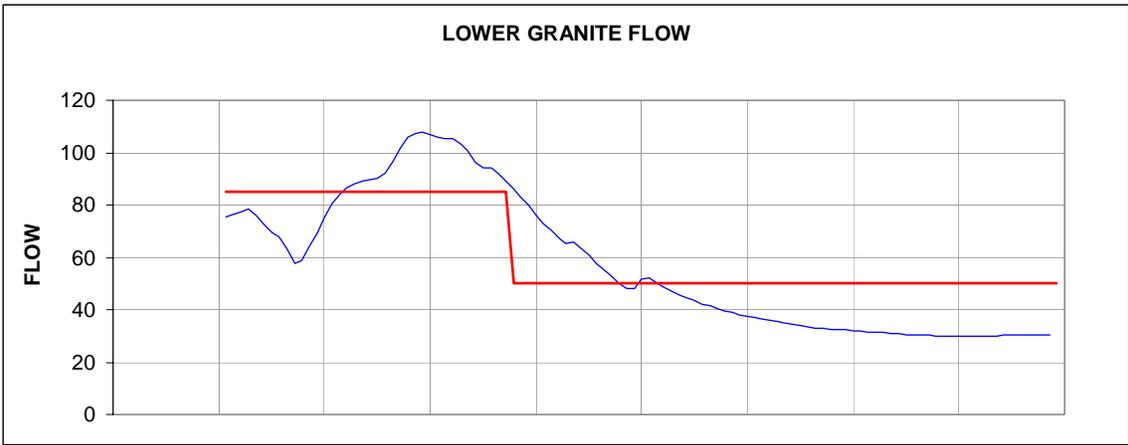
The next Technical Management Team meeting was set for Wednesday, May 21. Additional TMT meetings were scheduled for June 4 and June 18, as well as July 2, 16 and 30. Meeting summary prepared by Jeff Kuechle, BPA contractor.

**TMT Attendance List  
May 14, 2003**

<b>Name</b>	<b>Affiliation</b>
Donna Silverberg	Facilitation Team
David Wills	USFWS
Paul Wagner	NOAA Fisheries
Shane Scott	WDFW
Tony Norris	USBR
Rudd Turner	COE
John Wellschlager	BPA
Mike O'Bryant	Col. Basin Bulletin
Robin Harkless	Facilitation Team
Colin Beam	PPM
Tim Heizenrater	PPM
Tom Haymaker	PNGC
Kevin Nordt	PacifiCorp
Shawn Cradell	NW Energy Consulting
Jim Adams	COE
Russ George	WMCI
Mary Karen Scullion	COE
Kyle Martin	CRITFC
Steve Pettit	IDFG
Dick Lane	BPA
David Benner	FPC
Margaret Filardo	FPC

Ruth Burris	PGE
Craig Sprankle	USBR
Glenn Traeger	Avista
Richelle Beck	D. Rohr & Associates
Martin Hatcher	SCL
Ron Boyce	ODFW
Jim Litchfield	Consultant (Montana)





# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

21 May 2003      0900 - 1200 hours

Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. Vernita Bar and Priest Rapids update (Grant County PUD) [\[SOR #2003-7 \(revised\)\]](#) (103kB) 
3. Fish Spill Status and Tracking, NOAA Fisheries visits. (COE, NOAA Fisheries)  
[\[High 12hr Averages\]](#) [\[Exceedence Tracking\]](#)
4. Update on tailwater operations at Bonneville. (COE)
5. Snake River spill/transport criteria. (NOAA Fisheries) [\[SAR graphs\]](#) (44kB) 
6. Upcoming sturgeon operations at Libby. (USFWS)
7. [\[Summary of spring treaty fishery\]](#). (40kB)  (CRITFC)
8. Review current system conditions.
  - fish migration status (NOAA Fisheries, USFWS)
  - [\[reservoir operation\]](#), power system, water supply (COE, BOR, BPA)  
[\[DWR\]](#) [\[HGR\]](#) [\[LIB1\]](#) [\[LIB2\]](#) 
9. [\[SOR 2003-9\]](#) (88kB)  Dworshak operations update.
10. Review [\[operations requests\]](#).
11. Develop recommended operations.
12. Other.
  - Set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*



## COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 N.E. Oregon, Suite 200, Portland, Oregon 97232

Telephone (503) 238-0667

Fax (503) 235-4228

www.critfc.org

TO: Technical Management Team  
FROM: Kyle Martin, *Senior Hydrologist*, CRITFC Hydro Program  
DATE: May 21, 2003

SUBJECT: Impact of Pool Fluctuations on the 2003 Spring Treaty Fishery

CRITFC System Operation Request 2003-C1 was submitted April 23<sup>rd</sup>, 2003 via the NMFS' Technical Management Team forum in support of this spring's treaty fishing. The CRITFC request asked for (1) specific elevations and (2) stable pool elevations during April 24-26.

Criterion #1 asked to operate the pools within a one-foot specified elevation range. The Corps replied with a commitment to a 1.5-foot range, and then only in Bonneville pool, as they have done so since 1996 (according to the Corps' interpretation of the "Ted Strong agreement"). The Corps claims the top operating limit at the Bonneville pool is 76.5 feet, and not 77 feet (full pool) as outlined in the CRITFC request, and will not exceed that upper limit except for an emergency.

Figure 1 shows the hourly compliance of CRITFC's elevation range criteria during the treaty fishery. The Bonneville pool complied 43% of the time. The Celilo pool complied 44% of the time. The John Day pool complied 15% of the time. The spring 2002 compliance values were 63% at the Bonneville pool, 41% at the Celilo pool, and 44% at the John Day pool.

Figure 2 shows the hourly compliance of the elevation criteria if the Corps' 75.5 to 76.5 foot range at Bonneville is used. The Bonneville pool complied 82% of the time. This result suggests that a much higher compliance by the Corps may result if the 76.5-foot limit is used, which coincides with the Corps' normal operating range. Compliance using the Corps' 1.5-foot criteria at all pools was 77% to 100%.

Pool elevation data is a good measure as to the absolute pool fluctuations (Criterion #2). Figures 3 and 4 show the observed pool elevations during the times of the fishery. If the criterion was to limit fluctuations to one foot or less, irrespective to any absolute elevation criteria, then the Bonneville pool (which stayed near 0.5 foot) complied 100% of the time. The Celilo pool and John Day pool complied almost all of the time. The Corps seems to be reducing the absolute pool fluctuations, even if they are not in full compliance with the elevation criteria.

Attachments

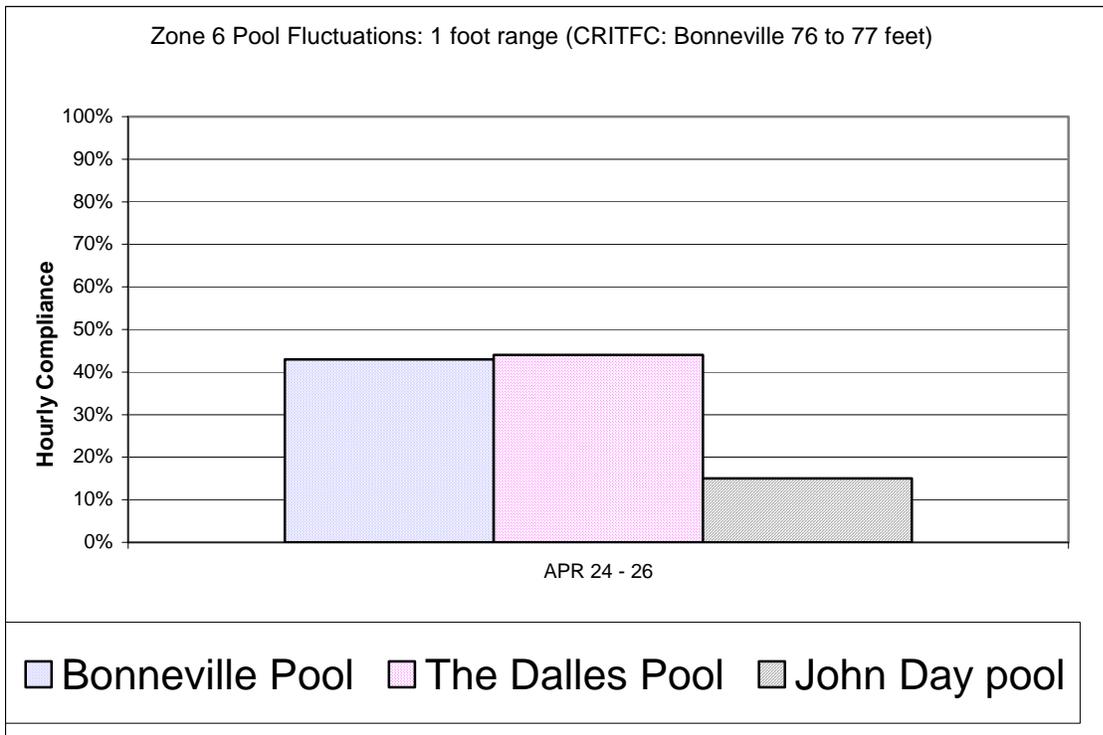


Figure 2. Corps compliance with CRITFC criteria for operating pools during treaty fishing.

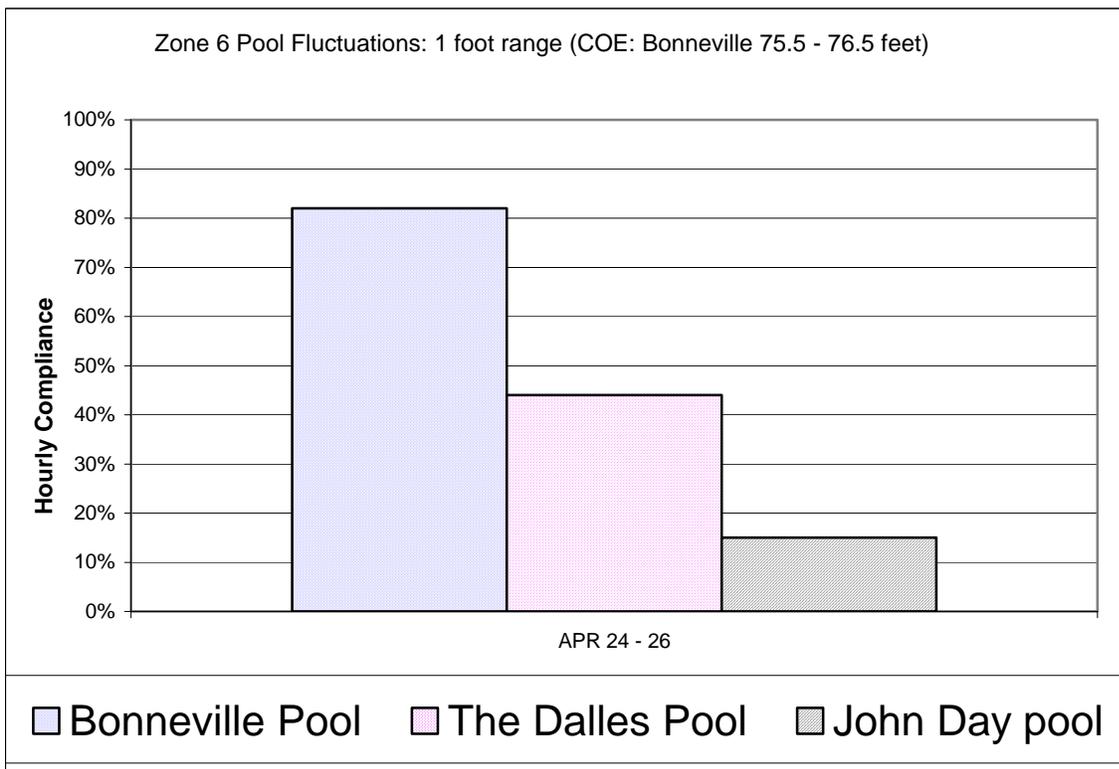


Figure 3. Compliance with CRITFC criteria, using Corps definition of full pool of Bonneville.

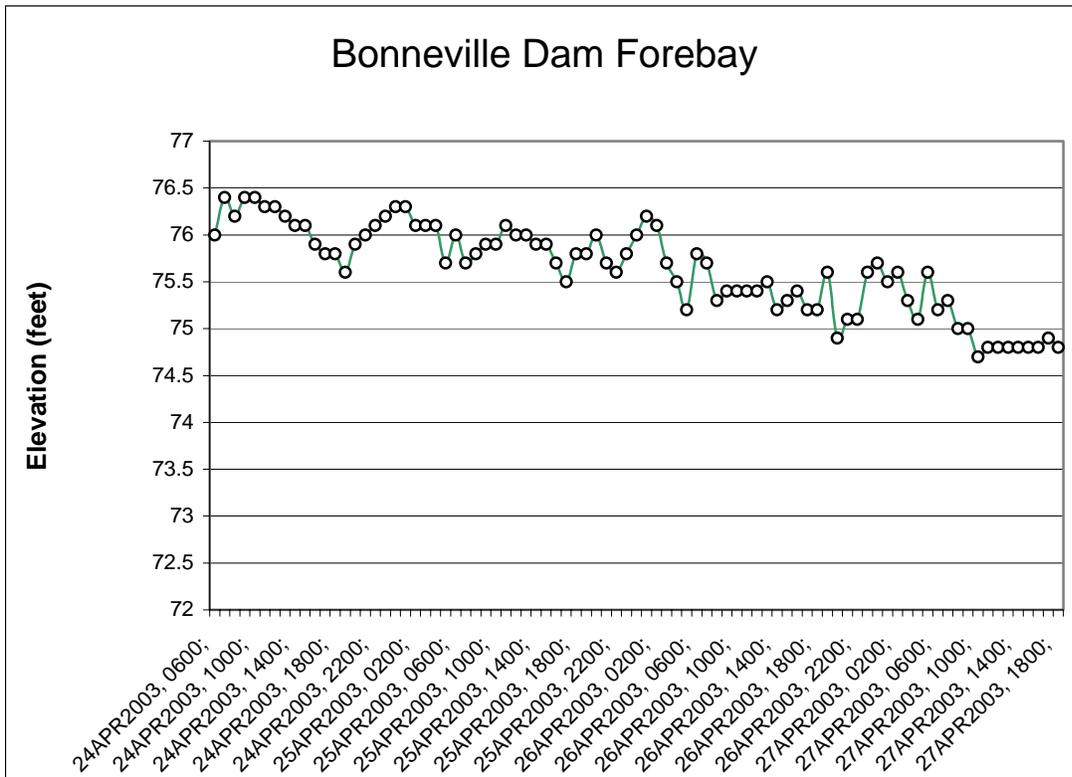


Figure 4. Observed pool elevations during 2003 spring treaty fishing for Bonneville pool.

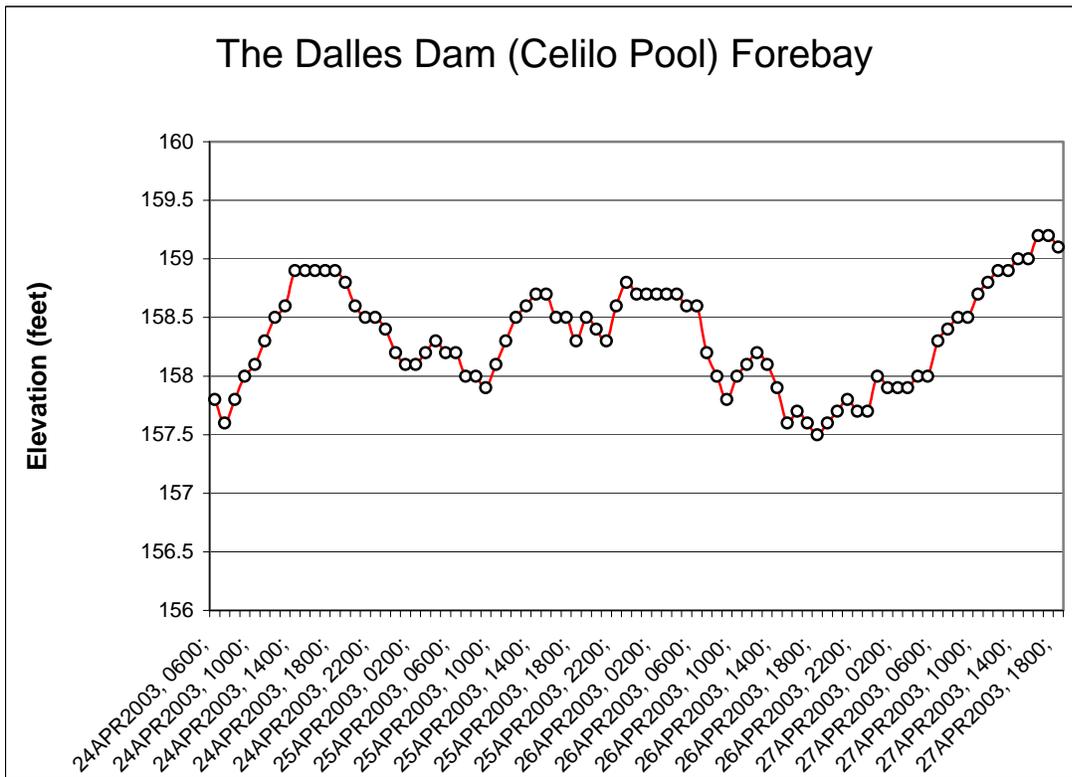


Figure 5. Observed pool elevations during 2003 spring treaty fishing for The Dalles pool.

# **COLUMBIA RIVER REGIONAL FORUM**

## **TECHNICAL MANAGEMENT TEAM**

### **MEETING NOTES**

**May 21, 2003**

## **CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM HOUSE PORTLAND, OREGON**

**TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>**

### **FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS**

Facilitator: Robin Harkless

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.

#### **Vernita Bar/Priest Rapids Update:**

Chris Carlson reported on Priest Rapids operations for the last two weeks. The information is also posted on the TMT web site. Kyle Martin provided a handout of hourly flows and inquired about fluctuations on May 16. Chris said that Grand Coulee operations may have had an impact on flows at Hanford Reach.

Dave Wills briefly updated TMT on SOR 2003-7. He asked whether current operations of 135 kcfs at Priest Rapids could be continued through June 8; the Action Agency representatives agreed to continue the operation.

#### **Fish Spill Status and Tracking:**

Laura Hamilton reported eleven TDG exceedances from May 6-19. The handout she provided is also located on the TMT web site. Paul Wagner reported on his observations of the COE's spill tracking process. His observation was that, because of low flows, it is difficult to make quick adjustments. Many factors, including tests and temperature changes, affect spill levels. The COE and NOAA are communicating daily on spill changes; both agencies feel the process is working well. Washington agreed that TDG exceedances should be avoided, and appreciate the complexity of adjusting spill. TMT members are encouraged to observe the process. Dave Wills, USFWS, expressed an interest in observing.

#### **Tailwater Operations at Bonneville:**

Per discussions at last week's TMT meeting, and follow-up communication between Washington and the COE (summarized in an email on May 16), the hard constraint of 16.5' at the Bonneville tailwater was changed to a soft constraint on May 16, and the restriction was lifted at midnight on May 19. May 18 was the end of Chinook emergence. Ron Boyce requested that the Action Agencies be mindful that there have still been some

Chinook observed in the river. So far, elevations have been at 18-20', well above the former 16.5' constraint.

**Snake River Spill/ Transport:**

Paul Wagner reported that further studies from the NMFS Science Center on spill and transport indicate that this year, which is similar to the year 1999, it would be more beneficial to leave the fish in the river and spread the risk, rather than transport.

**Upcoming Sturgeon Operations at Libby:**

Dave Wills reported that the USFWS expects to present an SOR for sturgeon operations at Libby in the next two weeks (by the June 4 TMT meeting). The agency is waiting to observe whether natural spawning of the sturgeon occurs – if it does, the request will likely be to begin the pulse then, around June 9. If it does not occur, the likely request will be to use the water for hatchery fry, around the end of June/early July. Ultimately, 800 KAF will be requested. The COE will run a model to project refill at Libby. As of today, Rudd Turner said that there is a good probability that the request can be met. Dave will continue to coordinate with the COE on this issue – the sooner the COE has an indication of which operation will be requested, the better. A comment was made that, to avoid what occurred during last year's operations for sturgeon, it would be beneficial to move the water out sooner.

**Spring Treaty Fishery Summary:**

Kyle Martin reported on the April 23 - 26 spring treaty fishery and presented a handout that included statistics on operations. He reported that there were few fluctuations and that it was a 'good' fishery. The COE also presented information on operations for the fishery. Both reports can be found on the TMT web site.

Kyle reported that an SOR from CRITFC will be presented later today to the COE to begin a fishery the following day, for two and a half days, in order to harvest the remaining fish. CRITFC and the COE will coordinate on this.

It was noted that the FTP website no longer holds the most current COE modeling; folks are encouraged to look at the COE's "Data Query" site for the latest information.

**Current Conditions:**

*Fish migration status:* Paul Wagner reported that adults are nearing the end of their spring run. The cumulative number of smolts this year is high; out migration looks similar to that of 2002. Lower Granite steelhead numbers are not as high this year as past years, probably influenced by the RSW. Fish are still being observed in the tributaries. A big run of wild fish is expected to come from the tributaries.

*Reservoir operations:* Rudd Turner and Tony Norris reported on reservoir operations. Bonneville has been operating at 213-273 kcfs outflows; McNary is at 180-256 kcfs; and Lower Granite is slightly down from past weeks to 64-90 kcfs. Dworshak is at elevation 1561.4'. Outflows were reduced at Dworshak over the weekend to accommodate the Salmon Managers' request to spread out the water. Due to a rescue operation, Dworshak was operated at minimum flows for a while on Sunday, 5/18. Libby is at elevation

2420.0', filling about half a foot per day. Albeni Falls is refilling. Hungry Horse is at elevation 3527.4' and filling. An increase in flows from Columbia Falls to Hungry Horse is expected in the next week. Grand Coulee is at elevation 1269'.

*Power:* John Welschlager reported that the CGS is down for refueling, and that there should be no problem getting it back up to schedule.

### **SOR 2003-9 Update:**

The COE presented a ten-day model run for Dworshak operations, indicating that there is now a total of 50 ksf remaining. The COE again presented an alternative operation, which was presented at last week's TMT meeting. BPA suggested reducing spill some to save water for later in case the freshet does not occur when it is expected. Comments were made on Brownlee operations. Idaho was not represented at the meeting to confirm what operations at Brownlee will look like. The Salmon Managers also discussed alternative operations at Tuesday's FPAC meeting.

**ACTION:** The following operation was agreed to by TMT as a result of today's discussions and the model run/forecast:

- Continue spill at ~15 kcfs today; ramp down to 10 kcfs on 5/22 through 5/24; ramp down to 7.5 kcfs on 5/25 through 5/26; and ramp down to 1.5 kcfs on 5/27. Ramp downs will occur at midnight, the beginning of each day.
- Rudd Turner will contact Steve Pettit, who was not present at today's meeting, and share the decision on Dworshak operations agreed to today.

### **Next Meeting, June 4, 9am-noon:**

Agenda items:

- Vernita Bar
- Fish Spill Status and Tracking
- Priest Rapids Operations Update
- Dworshak Operations Update
- Spring Treaty Fishery Update
- Sturgeon Operations SOR
- Review Current Conditions

***\*\* NOTE: Ron Boyce and Shane Scott are coordinating a seining field trip for next Friday, May 30. Anyone interested in attending should contact Ron or Shane.***

## **Meeting Minutes**

### ***1. Greeting and Introductions***

The May 21, 2003 Technical Management Team meeting was chaired by Rudd Turner of the Corps and facilitated by Robin Harkless. The following is a distillation, not

a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Turner at 503/808-3935.

## ***2. Vernita Bar/Priest Rapids Update.***

Chris Carlson said that, for the week ending May 11, the average flow at Priest Rapids was 141.9 Kcfs; the flow band varied between 40 Kcfs and 60 Kcfs. The flow band was exceeded significantly on May 8 and May 11. During the week, a total of 29 subyearling chinook mortalities were found at 23 sample sites. For the week ending May 18, the average flow at Priest Rapids was 151.9 Kcfs; the flow band varied between 40 Kcfs to 60 Kcfs. The flow band was exceeded significantly only on May 13. Index seining found only one subyearling chinook mortality at the 13 sites sampled for the week.

The only other thing I have is that, based on the temperature units from the end of emergence, the fish have now accumulated 200 of the 400 CTUs needed, so we are now halfway through this operation, Carlson said.

With respect to SOR 2003-7, Davis Wills said his understanding was that the Corps and Bonneville would be targeting 135 Kcfs at Priest Rapids, but actual flows were higher than that target last week. Flows have been much closer to the target over the past several days, Turner replied. John Wellschlager, BPA, added that it should be possible to continue the current Grand Coulee/Priest Rapids operation for the next two weeks, through June 8. It was so agreed.

## ***3. Fish Spill Status and Tracking.***

Laura Hamilton drew the group's attention to the Corps' most recent exceedence tracking handout, for the week ending May 19. She noted that there were a total of 11 exceedences for that period, seven of which were at Ice Harbor, two at McNary and two at Camas/Washougal. All of the exceedences were Type 6, due to uncertainties when using best professional judgment in applying spill guidance criteria. Hamilton then moved on to average 24-hour spill data by project for the week; she noted that low river flows in the Snake and fish testing requirements limited spill volumes at many of these projects. Average spill at the Lower Columbia projects varied between 58.4 Kcfs at John Day to 119.7 Kcfs at Bonneville, again due to low total river flows and fish tests.

Paul Wagner provided a brief report on his visit to the RCC during the spill regulation process for three days last week; he likened the experience to steering a very unresponsive ship with a very loose tiller connection. Travel time, temperature changes and testing requirements are all complicating factors, he said; in general, you need a real feel for the system to do this job. People are watching this daily, he said, and we have set up a communications process that allows us to review these changes on a daily basis. Overall, however, NOAA Fisheries is comfortable with the way the Corps conducts this process, Wagner said. Any other TMT members who are interested are welcome to come see what we do, Turner added; please contact me or Jim Adams. Dave Wills said he would be interesting in coming over to RCC and seeing the work.

Shane Scott said WDFW has received some very critical comments from WDOE for signing the recent spill letter; exceeding water quality parameters is something we definitely do not want to do, he said, and we appreciate the work the Corps has done to be responsive on this issue.

#### ***4. Update on Bonneville Tailwater Operations.***

Turner said the action agencies had asked the salmon managers to confirm May 15 as the official end of the Lower Columbia chum emergence period. The salmon managers provided that confirmation, as well as some additional information about chinook emergence. With respect to the chinook, said Turner, they are not an ESA-listed species, so we're not under a BiOp obligation to do anything for them; however, we decided to ease off the tailwater restriction gradually. The Corps went to a soft constraint on the 16.5-foot Bonneville tailwater depth on May 16, he explained, then lifted the soft constraint on May 19. Bonneville tailwater depth stayed in the 18-20 foot range during this period.

Boyce said that field crews are still seeing some juvenile chinook in the Ives/Pierce Island area; he asked that, if possible, the action agencies continue the 16.5-foot tailwater depth as a soft constraint. Turner replied that, with Memorial Day weekend coming up, flows through the system will likely be low for at least a few days; flows at Bonneville fell to 170 Kcfs last night. In response to a question, however, John Wellschlager said Bonneville models show flows will likely be in the 240 Kcfs range over the coming weekend. It sounds like we should be OK, said Boyce; I just wanted you to be aware of this. We do not want this operation to impact operations for listed species, Boyce added.

We'll just leave this alone, then, said Turner; it shouldn't be a problem. Flows are expected to pick up next week, he added. Boyce noted that there has been stranding observed at the Ives/Pierce Island complex when Bonneville flows are in the 220 Kcfs-240 Kcfs range; he asked that flow fluctuations be minimized to the extent possible while flows are in this range. Wellschlager replied that, according to Bonneville forecasts, flow fluctuations should be no more than 2 Kcfs per day over the weekend.

#### ***5. Snake River Spill/Transport Criteria.***

Wagner said he has asked the NMFS Science Center to put together some additional information about how non-transported Snake River fish do as the season progresses. What we saw was that, in general, based on the 1998 data, for wild chinook, SARs generally declined as the season progressed; it doesn't look real good for non-transported fish after May 1, Wagner said.

However, flows were fairly high through the season in 1998, Wagner said; the question is, how did fish do in a year that more closely approximates the conditions we're seeing this year? In 1999, when conditions were fairly similar to 1998, in-river fish relatively well through the season. The bottom line is that NOAA Fisheries is comfortable recommending that the action agencies not go to maximum transportation at this point, Wagner said; rather, we recommend that the Corps continue with a spread-the-

risk approach for this year. Conditions to date in the season are quite similar in 2003 compared to where they were at this point in 1999, he added; hopefully we'll soon see a freshet on par with what we saw in 1999 as well.

#### ***6. Upcoming Sturgeon Operations at Libby.***

Wills said he had spoken with Bob Hallock; he said the Fish and Wildlife Service plans to develop an SOR for the next TMT on June 4 covering the 2003 Libby sturgeon operation. We're waiting to see if the natural sturgeon spawning takes place this year, he said; the sturgeon folks are monitoring the spawning activities of the adult sturgeon outplanted above Bonners Ferry, and if spawning occurs, it is expected to begin around June 9. It could be a little earlier, or it could be a little later, he said.

If spawning does occur, we would like to begin the sturgeon operation at that point; it would consist of an additional 22 Kcfs from Libby for 18 days, Wills said. If spawning doesn't work, we would like to put that 800 KAF on the release of the hatchery sturgeon fry beginning around July 1. So this is a real-time operation, and the decision will be made based on field observations of natural spawning? Wagner asked. That's correct, Wills replied. The earlier we know, the better, said Turner. We'll look for the Fish and Wildlife Service SOR on June 4, said Harkless.

#### ***7. Summary of Spring Treaty Fishery.***

Kyle Martin distributed a memo titled "Impact of Pool Fluctuations on the 2003 Spring Treaty Fishery." He noted that SOR 2003 C-1 requested that the action agencies maintain pool elevations at Bonneville, The Dalles and John Day within a one-foot elevation range during the fishery; the Corps replied with a commitment to a 1.5-foot operating range in Bonneville pool only. He noted that there is an ongoing disagreement between CRITFC and the Corps about what actually constitutes full pool at Bonneville; CRITFC says it is 77 feet, while the Corps says it is 76.5 feet.

Overall, said Martin, Bonneville Pool was in compliance with CRITFC's requested range 43% of the time this fishing season; Celilo (The Dalles) pool, 44% of the time, and John Day pool 15% of the time. The three pools were in compliance with the Corps' 1.5-foot operating range 77%-100% of the time. The take-home message is that, although we submitted the SOR on short notice, the fishery was still reasonable, said Martin. Tribal fishers reported no major problems, he added.

Martin added that CRITFC will be submitting another SOR covering a second fishery beginning tomorrow morning at 6 a.m. and ending Saturday, May 24 at 6 p.m. This will be the last spring fishery, he said; we will be requesting the same pool stability operation as before – one-foot operating ranges at all three pools. The Corps and BPA will make their best effort to provide stable pools, said Turner; if we have a problem, we'll call CRITFC. He added that, according to the hourly gauge data the Corps uses, the pools were within the requested elevation range during the entire period of the last treaty fishery. The data are from a forebay gage at the Bonneville spillway, which is the one the project uses as the official gage for operating. Martin agreed to redo his analyses of this and previous tribal fisheries using data from this gage. It is also good to hear that

there were no major problems reported, Turner said. So CRITFC and the Corps will coordinate the implementation of the new SOR when it is received? Harkless asked. Correct, Martin replied – I'll submit it later this afternoon.

### ***8. Current System Conditions.***

With respect to adult passage at Bonneville, Wagner reported that the run to date is in excess of 179,000 fish, significantly larger than the pre-season estimate. Adult passage is now on the decline, and we are entering the jack season, he said – about 12,000 jacks have passed Bonneville to date, which is greater than any recent year except 2000 and 2001. Moving on to smolt data, Wagner said the yearling chinook passage index of 3.2 million fish at Lower Granite is larger than the indices in 2000, 2001 or 2001, although it does not meet pre-season estimates. There are still a large number of fish waiting for the freshet, added Chris Ross; we're still expecting to see roughly twice as many wild outmigrants in 2003 as we saw in 2002.

The picture for steelhead is not as rosy, said Wagner; indices are only about half of what we saw at Lower Granite in 2000 and 2001. However, the operation of the RSW in 2002 and 2003 may be influencing the index numbers for those years. He noted that both the steelhead and chinook indices at Little Goose Dam downstream of Lower Granite support this theory. In general, said Wagner, the 2003 chinook and steelhead outmigration is still in progress -- our biologists tell us there are still a large number of wild juveniles waiting in the tributaries for the freshet to begin, so the outmigration is far from over.

Moving on to reservoir operations, Turner said yesterday's average flow at Bonneville Dam was 227 Kcfs, and ranged between 213 Kcfs and 273 Kcfs over the past week. Average flow at McNary was 216 Kcfs yesterday, and ranged between 180 Kcfs and 256 Kcfs over the past week. Average flow at Lower Granite was 72 Kcfs yesterday, and ranged between 64 Kcfs and 90 Kcfs over the past week. Lower Granite's Day-average hit 89.7 Kcfs on May 17, Turner said. Dworshak elevation is now 1561.4 feet; the project drafted six feet over the past two weeks, with inflows in the 10 Kcfs-13 Kcfs range and outflows of 15.5 Kcfs.

On Friday, May 16, with the forecast showing flows in the 90 Kcfs range over the weekend at Lower Granite, we decided to save some water at Dworshak, Turner said; we ramped down to full powerhouse capacity (10 Kcfs) on Friday evening. On Saturday, the project told RCC that the local sheriff's office reported a vehicle going into the Clearwater; they requested minimum Dworshak outflow from 7 a.m.-3 p.m. to attempt a recovery operation. We then ramped back up to 15 Kcfs outflow from Dworshak by 8 p.m. on Sunday, Turner said. And that's what caused you to miss the Lower Granite flow target on Sunday and Monday? Boyce asked. Yes – Lower Granite's average flow fell to about 83 Kcfs during that period, Turner replied.

Turner reported that the current elevation at Libby is 2420 feet, with 4 Kcfs out and 10.4 Kcfs inflow yesterday. The project filled 7 feet over the past two weeks. He said Albeni Falls is at elevation 2055.8 feet, on refill trajectory, releasing 35-38 Kcfs. Tony Norris reported that Hungry Horse is at elevation 3527.4 and filling, releasing 4.4 Kcfs

during the week, and 2.3 Kcfs on the weekend. We're expecting Hungry Horse inflows to rise dramatically, to the 18 Kcfs range over the next week, he added. Grand Coulee is at elevation 1269 feet, currently, Norris said.

With respect to the power system, there is nothing unusual to report, said Wellschlager, except that the Columbia Generating Station is still down for maintenance. They're a bit behind schedule but confident they can make up that time, Wellschlager said. According to the May final forecast, we're at 84% and 86% of normal water supply at The Dalles and Lower Granite, respectively, Turner added. The forecast is improving, but 2003 is still shaping up to be a below-average water year, he said.

Turner then touched on the Corps' most recent volume histograms for Dworshak, Libby and Hungry Horse. Yesterday there were 75 Ksfd of available flow augmentation volume at Dworshak, assuming a 50% confidence of refill at that project, Turner said; at 15 Kcfs outflow, that gives us approximately five days left at that flow. In other words, Turner said, we should consider ramping down Dworshak outflow later this week.

Turner also touched on the most recent volume histogram information for Libby; again assuming a 50% confidence of refill by July 31, as well as an 800 KAF sturgeon pulse, we would have approximately 564 KAF or 284 ksf available for July flow augmentation from Libby, he said. That would be in addition to the 20 feet that is normally drafted from Libby during August, Turner added. If we attempt to refill Libby by June 30, however, there would be no water available for flow augmentation from Libby in June, Turner said. He added that, at a 50% refill confidence, there will be approximately 297 KAF (150 ksf) available for flow augmentation from Hungry Horse this summer.

#### ***9. SOR 2003-9 (Dworshak Operations) Update.***

The current plan is to run with 15 Kcfs outflow at Dworshak through this Friday, May 23, then begin ramping down, Turner said. Is that still what we want to do? At last week's TMT meeting, he said, we discussed one potential rampdown scenario: to drop Dworshak outflow to 10.5 Kcfs on Saturday, May 24, to 7.5 Kcfs on Sunday, May 25, to 3.5 Kcfs on Monday, May 26, to 1.5 by midnight Tuesday, May 27. We're showing 17 Kcfs-18 Kcfs from Hells Canyon through the weekend, then 17 Kcfs-19 Kcfs next week, Turner said. We're looking at flows in the mid-70 Kcfs range at Lower Granite next week, then a flow peak that should bring us to over 100 Kcfs on Sunday, Monday and Tuesday, June 1-2-3, despite the fact that Dworshak will be at minimum outflow by then, Turner said. Dworshak will then need to be on minimum outflow through June 30 in order to refill, Turner added.

He noted, however, that all of this assumes that actual flows will closely mirror the forecast; if you want to hedge your bets a little, we might want to start ramping down sooner and extend the period of high Dworshak outflow for an extra day or two, Turner said.

After a few minutes of discussion, the TMT recommended the following operation: reduce Dworshak outflow to full powerhouse capacity (10 Kcfs), eliminating

spill at that project beginning tonight at midnight, then releasing 10 Kcfs through midnight, May 24. Dworshak discharge will then be reduced to 7.5 Kcfs on May 25 and May 26, and to 1.5 Kcfs by midnight that day. Turner said he will coordinate this operation with Steve Pettit to be sure IDFG has no objection. [Turner called Pettit later that day and left him a voice mail message.]

**10. New System Operational Requests.**

No new SORs were submitted prior to today's meeting.

**11. Recommended Operations.**

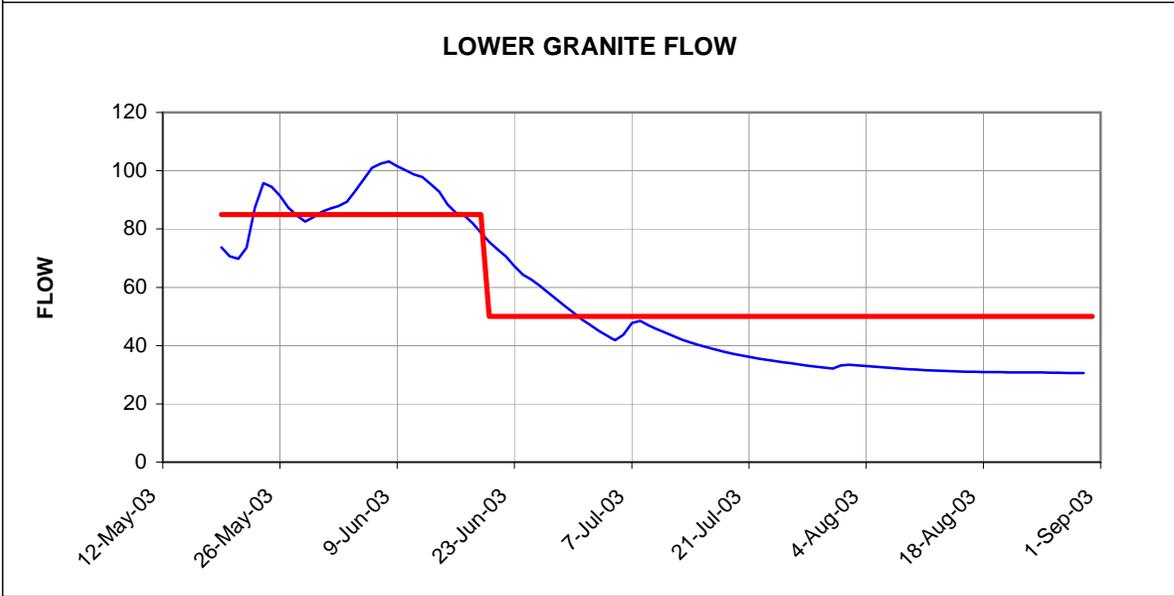
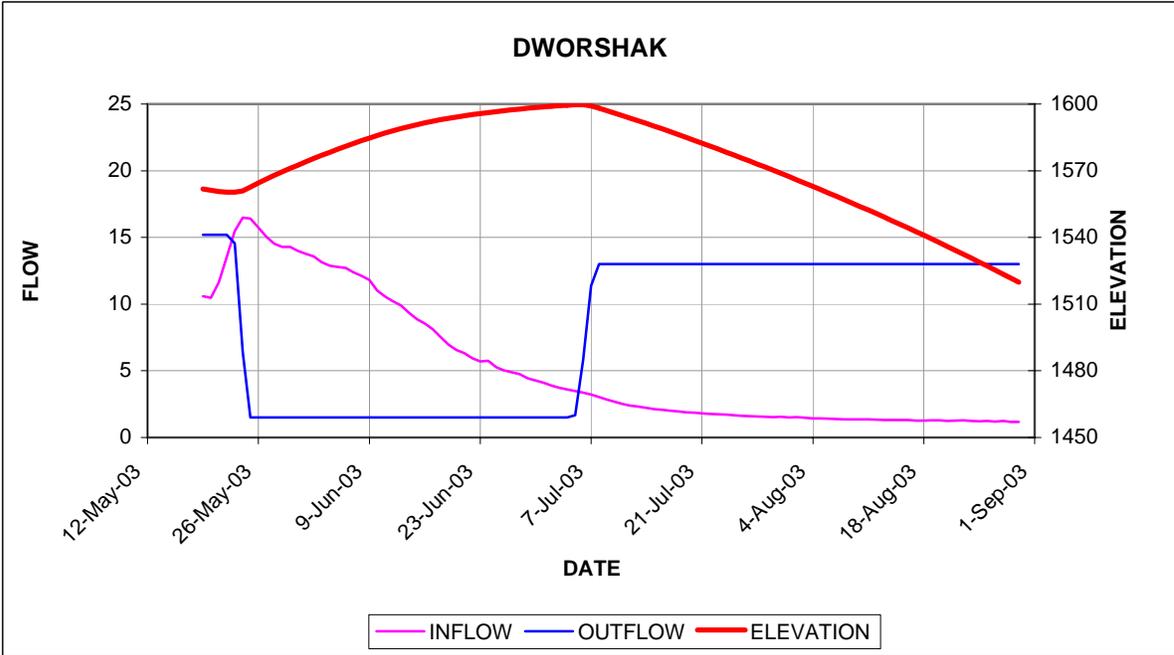
Recommended operations were covered earlier in today's agenda.

**12. Next TMT Meeting Date.**

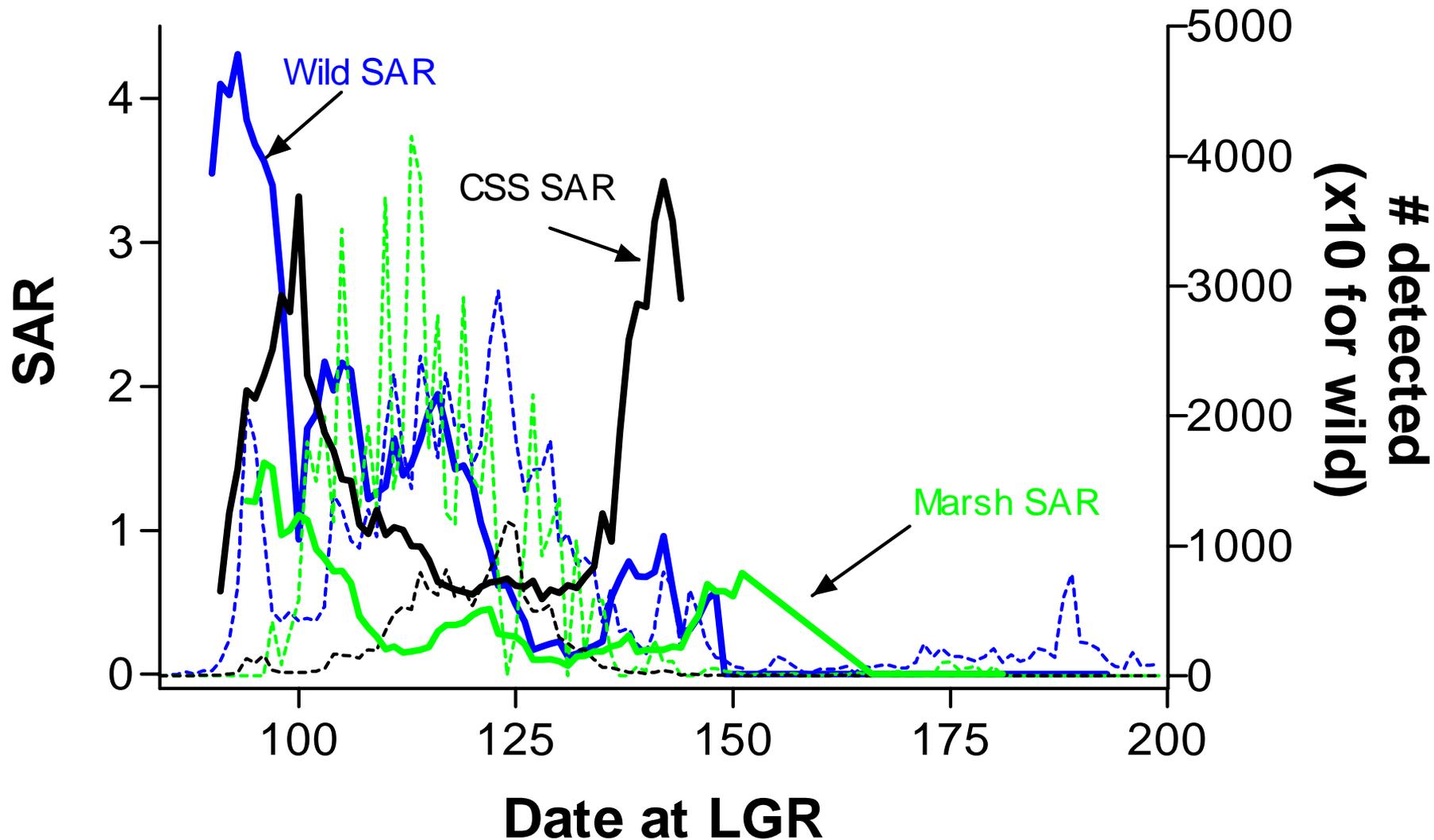
The next meeting of the Technical Management Team was set for Wednesday, June 4. Meeting summary prepared by Jeff Kuechle.

Shane Scott	WDFW
Rudd Turner	COE
John Wellschlager	BPA
Ron Boyce	ODFW
Robin Harkless	DS Consulting
David Wills	USFWS
Paul Wagner	NOAA Fisheries
Tony Norris	BOR
Chris Ross	NOAA Fisheries
Kyle Martin	CRITFC
Dave Statler	Nez Perce Tribe
Jim Adams	COE
Mary Karen Scullion	COE
Scott Boyd	COE
Laura Hamilton	COE
Beck	
Cradell	
Beam	
Heizenrater	
George	
Burris	
Benner	
Traeger	
Filardo	
Carlson	
Bill Rudolph	
Le	
Martin Hatcher, SCL	
Haymaker	

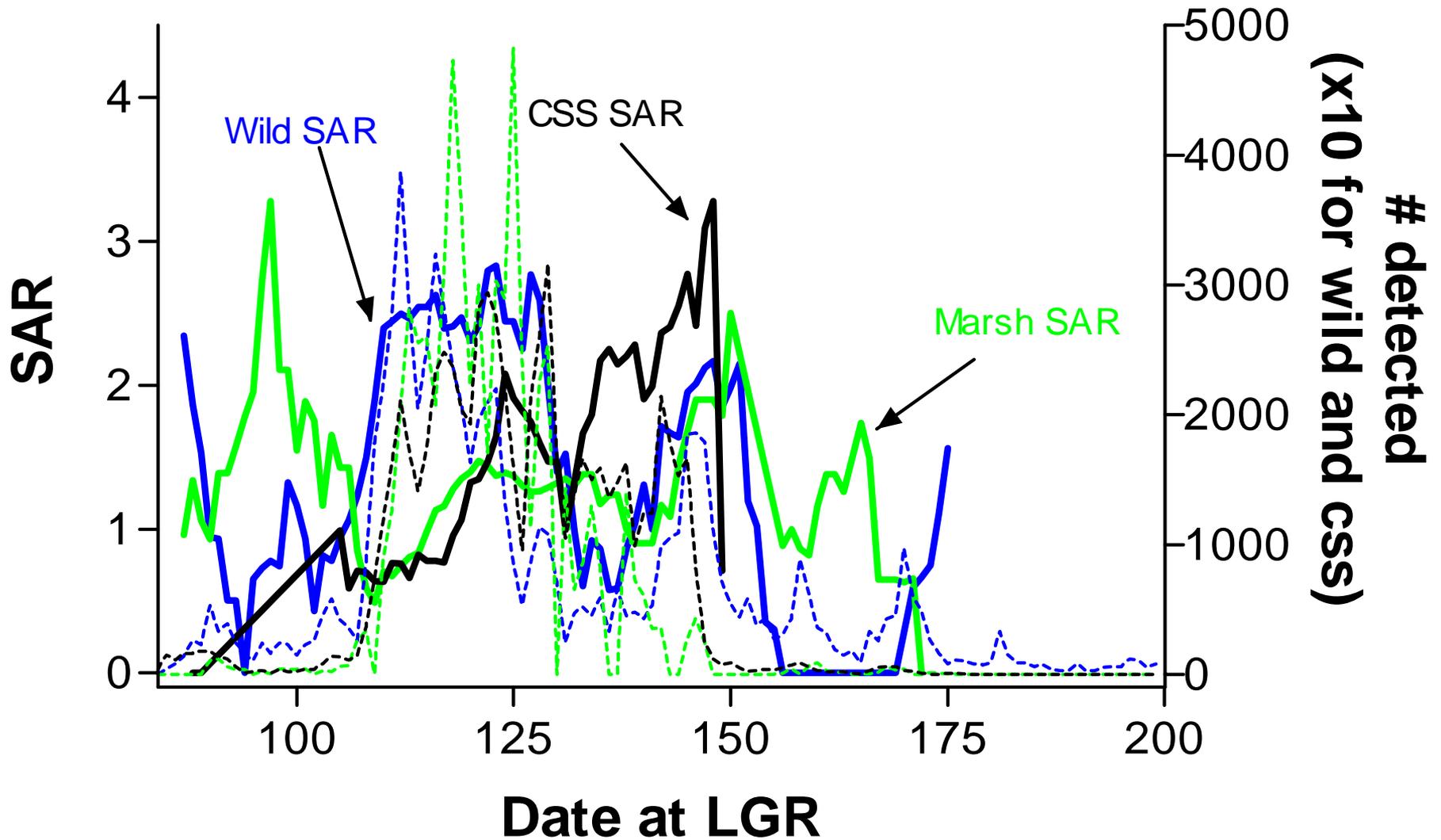
Butchko



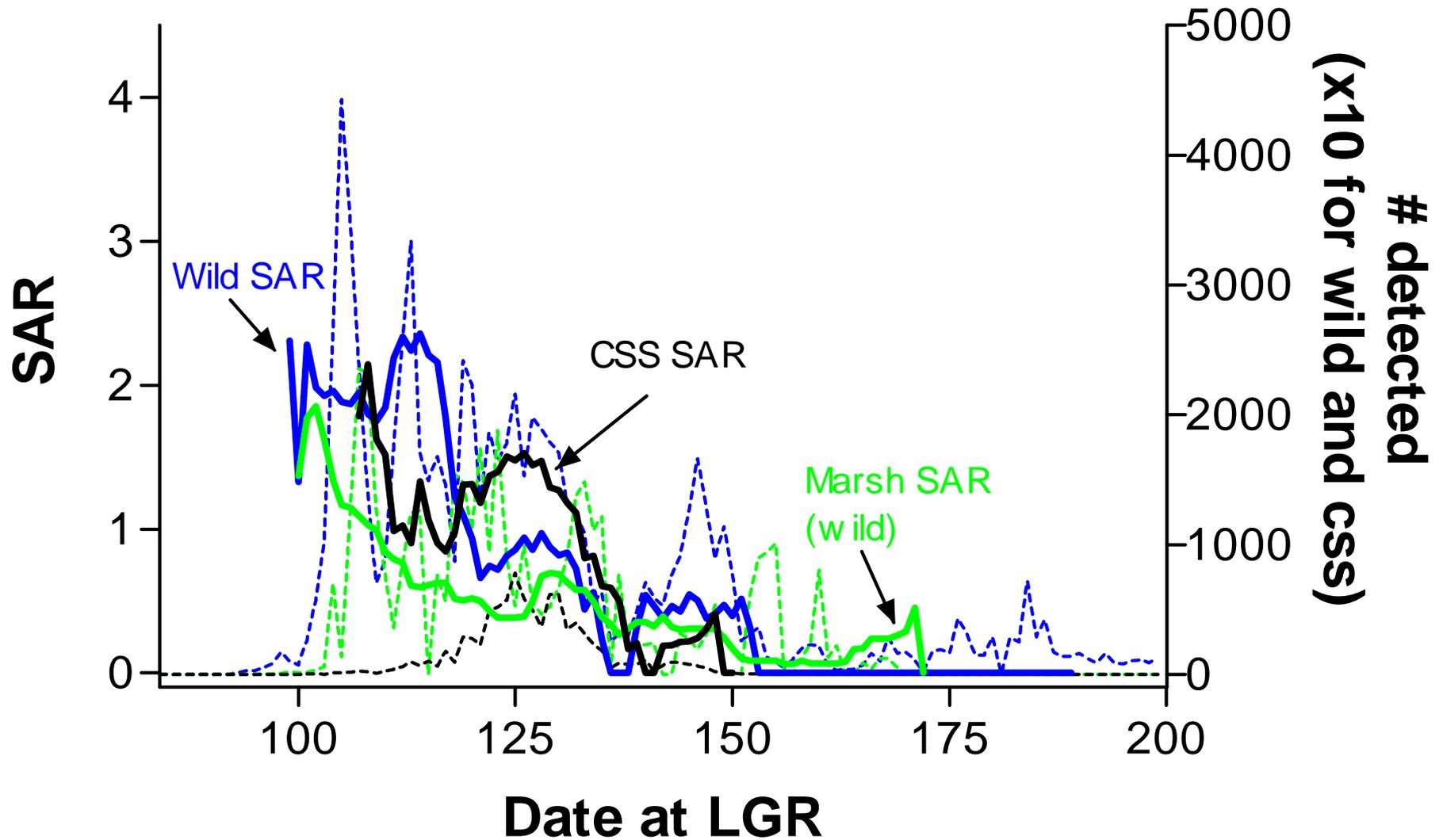
# SAR vs. Date at LGR 1998 nontransp. PIT-tagged CH



# SAR vs. Date at LGR 1999 nontransp. PIT-tagged CH



# SAR vs. Date at LGR 2000 nontransp. PIT-tagged CH



# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**04 June 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
  2. Vernita Bar and Priest Rapids update [\[SOR #2003-7 \(revised\)\]](#) (103kB)  (Grant County PUD)
  3. Fish spill status and tracking. (COE)  
[\[High 12hr Averages\]](#) [\[Exceedence Tracking\]](#)
  4. Dworshak operations update [\(SOR 2003-9\)](#). (88kB)  (COE)
  5. [Summary](#) of spring treaty fishery. (CRITFC)
  6. Review current system conditions.
    - fish migration status (NOAA Fisheries, USFWS)
    - [reservoir operation](#), power system, water supply (COE, BOR, BPA)  
[\[DWR\]](#) [\[HGR\]](#) [\[LIB1\]](#) [\[LIB2\]](#) 
  7. Request for sturgeon operations at Libby. (USFWS)
  8. Review [operations requests](#).
  9. Develop recommended operations for 9-22 June.
  10. Other.
    - Set agenda for next meeting
    - Lower Monumental Spill Photos
- [\[LMN-51\]](#) [\[LMN-52\]](#) [\[LMN-53\]](#) [\[LMN-54\]](#) [\[LMN-55\]](#) [\[LMN-56\]](#)  
[\[LMN-57\]](#) [\[LMN-58\]](#) [\[LMN-59\]](#) [\[LMN-60\]](#) [\[LMN-61\]](#) [\[LMN-62\]](#) [\[LMN-63\]](#)

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*



## COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION

729 N.E. Oregon, Suite 200, Portland, Oregon 97232

Telephone (503) 238-0667

Fax (503) 235-4228

www.critfc.org

TO: Technical Management Team (TMT)  
 FROM: Kyle Martin, *Senior Hydrologist*, CRITFC Hydro Program  
 DATE: June 4, 2003

SUBJECT: Impact of Pool Fluctuations on 2003 Spring Treaty Fishery—Revised Summary

CRITFC submitted three System Operation Requests (2003-C1, 2003-C2, 2003-Yakama1) via the NMFS' TMT forum in support of this spring's treaty fishing. The CRITFC request asked for (1) specific elevations and (2) stable pool elevations during April 24-26, May 22-24 and 29-31.

Criterion #1 asked to operate the pools within a one-foot specified elevation range. The Corps replied with a commitment to a 1.5-foot range, and then only in Bonneville pool, as they have done so since 1996 (according to the Corps' interpretation of the "Ted Strong agreement"). The Corps claims the top operating limit at the Bonneville pool is 76.5 feet, and not 77 feet (full pool) as outlined in the CRITFC request, and will not exceed that upper limit except for an emergency.

The table below shows the hourly compliance of CRITFC's elevation range criteria during the treaty fishery. On average, the Bonneville pool complied 13% of the time. Using the Corps 75.5 to 76.5 foot range, compliance was 53%. The Celilo (The Dalles) pool complied 59% of the time. The John Day pool complied 35% of the time.

2003	Bonneville Pool	The Dalles Pool	John Day pool
1 foot range (CRITFC):	76 - 77 ft	158.5 - 159.5 ft	263.5 - 264.5 ft
APR 24 - 26	39%	44%	15%
MAY 22 - 24	0%	64%	20%
MAY 29 - 31	0%	70%	69%
1 foot range (COE):	75.5 - 76.5 ft	158.5 - 159.5 ft	263.5 - 264.5 ft
APR 24 - 26	92%	44%	15%
MAY 22 - 24	66%	64%	20%
MAY 29 - 31	2%	70%	69%
1.5 foot range (COE):	75 - 76.5 ft	158 - 159.5 ft	263 - 264.5 ft
APR 24 - 26	100%	84%	77%
MAY 22 - 24	98%	95%	80%
MAY 29 - 31*	95%	93%	82%

\*Corps agreed to a 74-75.5 foot range at Bonneville, in coordination with CRITFC.

Pool elevation data is a good measure as to the absolute pool fluctuations (Criterion #2) as shown in figures 1 (Bonneville) and 2 (The Dalles). If the criterion was to limit fluctuations to one foot or less, irrespective to any absolute elevation criteria, then the Bonneville pool (which stayed near 0.5 foot) complied most of the time (except during the May 29-31 fishery), as did The Dalles and John Day. The Corps seems to be reducing the absolute pool fluctuations, even if they are not in full compliance with the elevation criteria.

Rudd Turner of the Corps recently pointed out that two forebay gages exist at Bonneville dam. The Corps uses the “HS” (spillway) gage as their official gauging station. The Bonneville pool data that CRITFC has downloaded over the last few years has been updated with the “HS” data and compliance statistics for 2002 and 2001 have been re-calculated and given below.

<b>2002</b>	Bonneville Pool	The Dalles Pool	John Day pool
1 foot range (CRITFC):	76 - 77 ft	158.5 -159.5 ft	263.5 - 264.5 ft
APR 2 - 13	30%	80%	91%
APR 15 - 20	29%	45%	66%
APR 25 -27	36%	41%	21%
MAY 2 -4	10%	39%	26%
MAY 10 -11	62%	41%	49%
MAY 17 - 18	78%	3%	11%
Seasonal Average:	41%	42%	44%
1 foot range (COE):	75.5 - 76.5 ft	158.5 -159.5 ft	263.5 - 264.5 ft
APR 2 - 13	80%	80%	91%
APR 15 - 20	77%	45%	66%
APR 25 -27	93%	41%	21%
MAY 2 -4	84%	39%	26%
MAY 10 -11	97%	41%	49%
MAY 17 - 18	100%	3%	11%
Seasonal Average:	89%	42%	44%
1.5 foot range (COE):	75 - 76.5 ft	158 -159.5 ft	263 - 264.5 ft
APR 2 - 13	96%	98%	100%
APR 15 - 20	100%	85%	100%
APR 25 -27	100%	80%	82%
MAY 2 -4	100%	89%	89%
MAY 10 -11	100%	97%	100%
MAY 17 - 18	100%	65%	95%
Seasonal Average:	99%	86%	94%

<b>2001</b>			
	Bonneville Pool	The Dalles Pool	John Day pool
1 foot range (CRITFC):	76 - 77 ft	158.5 -159.5 ft	263.5 - 264.5 ft
MAR 27 - MAR 31	52%	60%	100%
APR 2 - 7	30%	73%	100%
APR 9 - 14	41%	8%	64%
APR 17 - 19	26%	89%	98%
APR 26 - 28	21%	95%	92%
MAY 4 - 5	14%	100%	100%
MAY 24 - 26	28%	57%	95%
Seasonal average:	30%	69%	93%

1 foot range (COE):	75.5 - 76.5 ft	158.5 -159.5 ft	263.5 - 264.5 ft
MAR 27 - MAR 31	94%	60%	100%
APR 2 - 7	88%	73%	100%
APR 9 - 14	94%	8%	64%
APR 17 - 19	97%	89%	98%
APR 26 - 28	79%	95%	92%
MAY 4 - 5	73%	100%	100%
MAY 24 - 26	75%	57%	95%
Seasonal average:	86%	69%	93%

1.5 foot range (COE):	75 - 76.5 ft	158 -159.5 ft	263 - 264.5 ft
MAR 27 - MAR 31	99%	100%	100%
APR 2 - 7	100%	90%	100%
APR 9 - 14	100%	60%	98%
APR 17 - 19	100%	100%	100%
APR 26 - 28	100%	100%	100%
MAY 4 - 5	100%	100%	100%
MAY 24 - 26	100%	79%	100%
Seasonal average:	100%	90%	100%

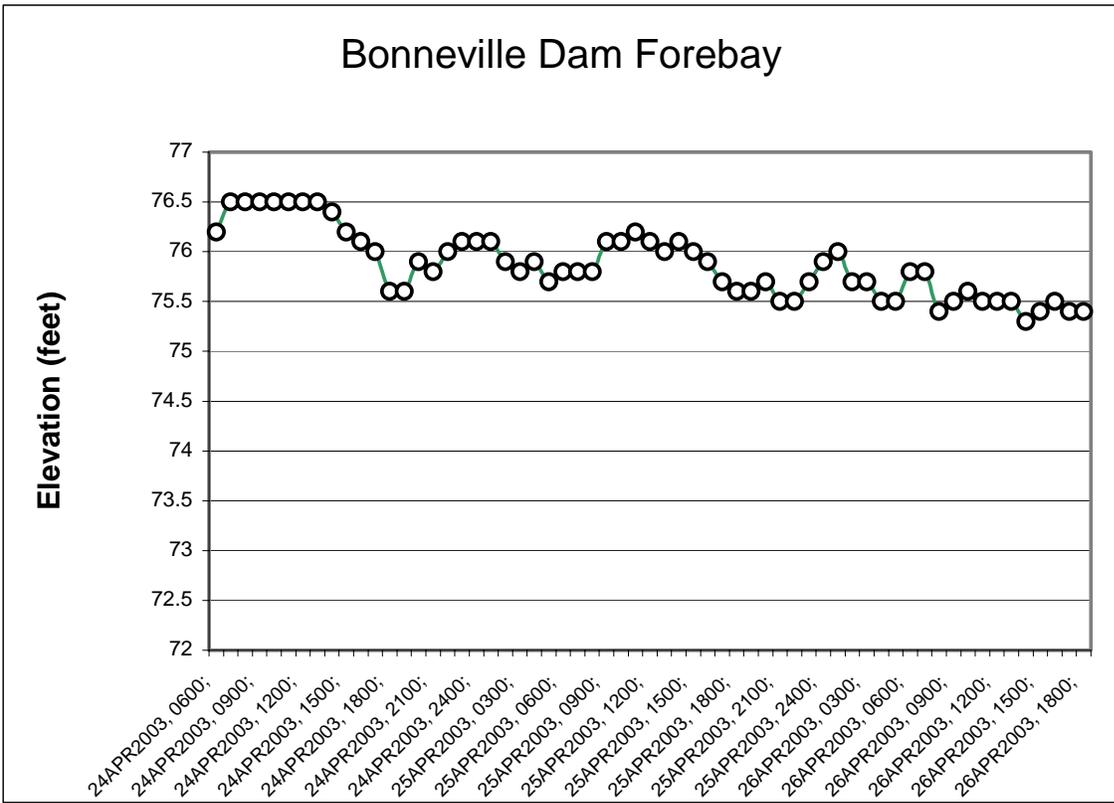


Figure 1a. Observed pool elevations during April 22-24, 2003 spring treaty fishing (BON pool).

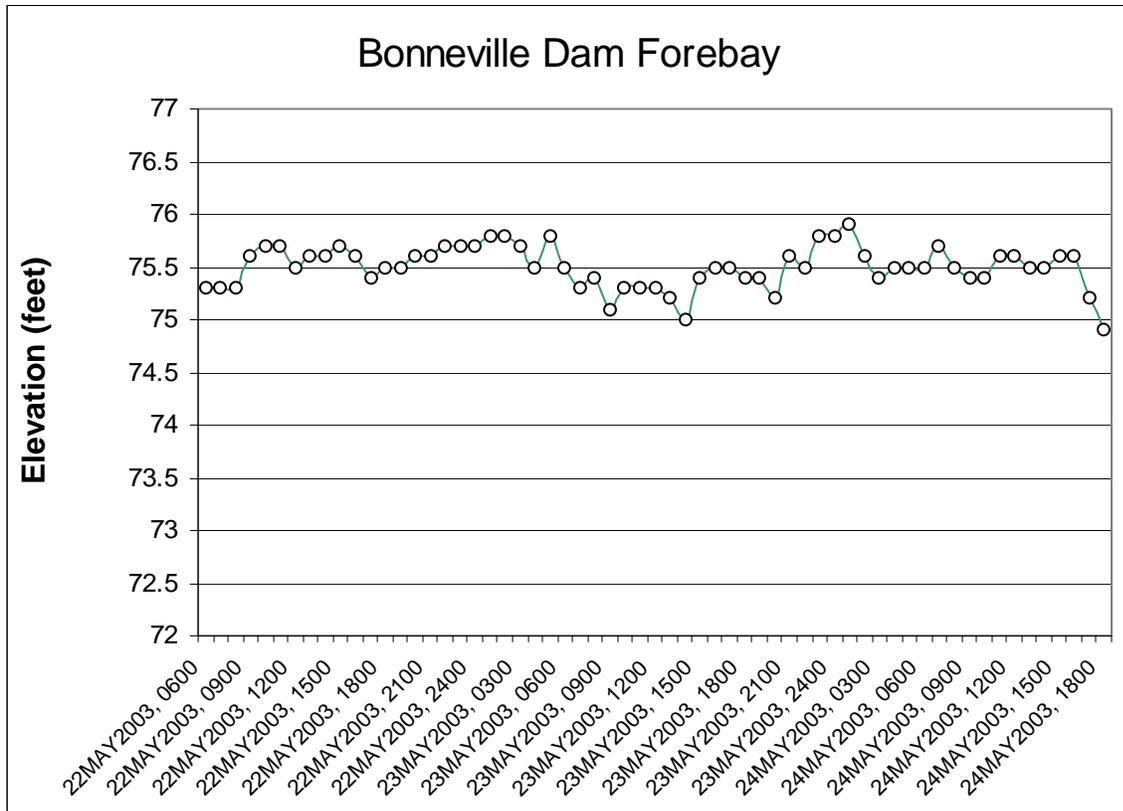


Figure 1b. Observed pool elevations during May 22-24, 2003 spring treaty fishing (BON pool).



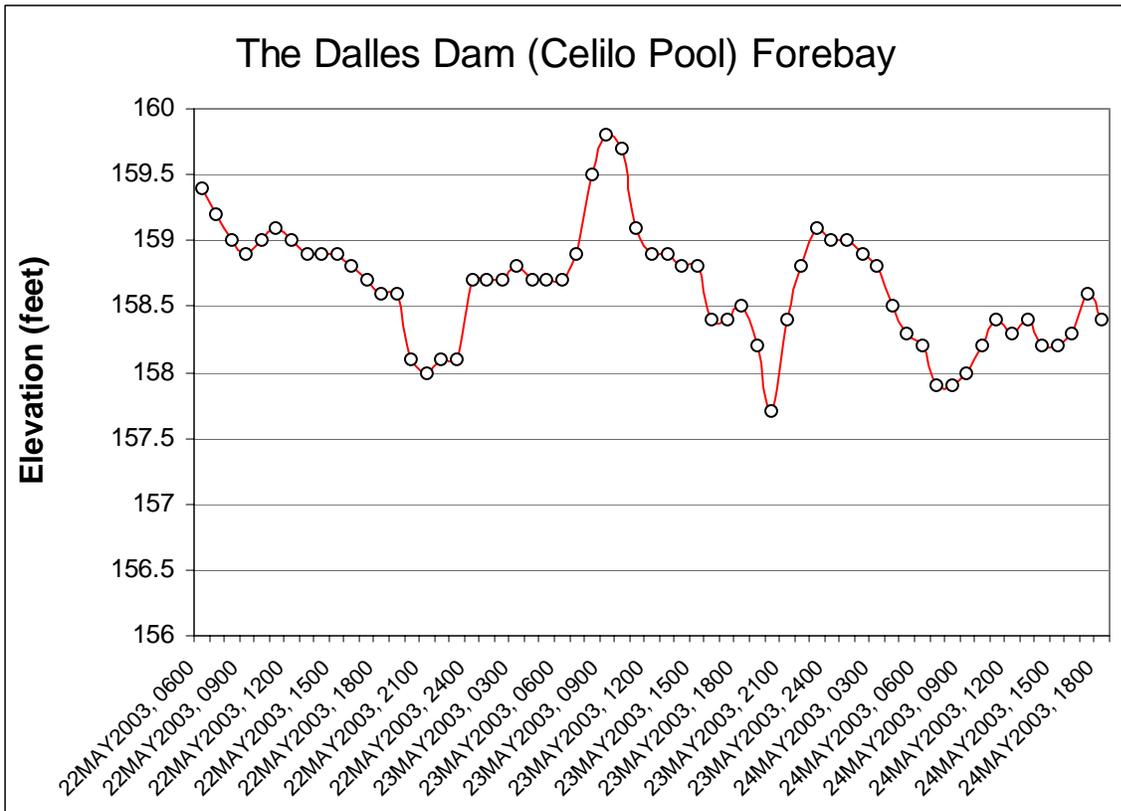


Figure 2b. Observed pool elevations during May 22-24, 2003 spring treaty fishing (TDA pool).

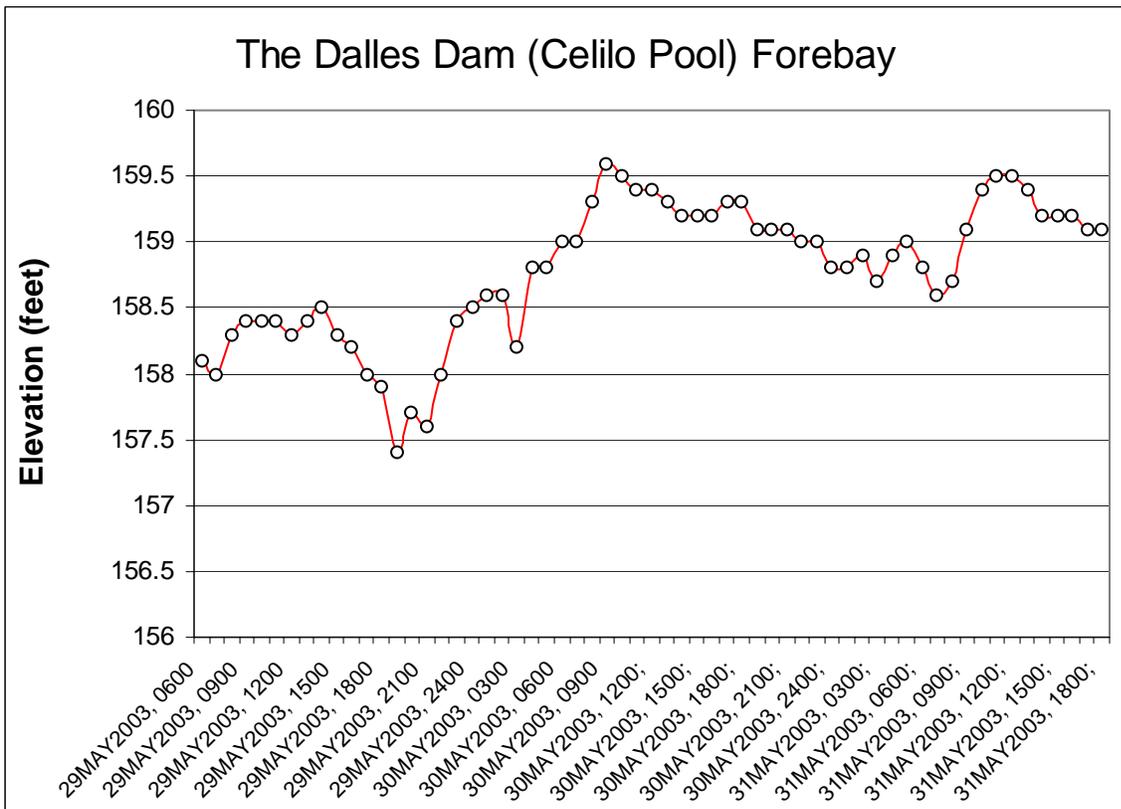


Figure 2c. Observed pool elevations during May 29-31, 2003 spring treaty fishing (TDA pool).



























# COLUMBIA RIVER REGIONAL FORUM

## TECHNICAL MANAGEMENT TEAM MEETING NOTES

June 4, 2003

CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM  
HOUSE  
PORTLAND, OREGON

TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>

# DRAFT

## FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Donna Silverberg

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

### **Vernita Bar/Priest Rapids Update:**

Chris Carlson reported on Priest Rapids operations for the previous two weeks. The information is also posted on the TMT web site. Kyle Martin provided a handout of hourly flows and inquired about fluctuations over the weekend. Chris explained the difficulty in avoiding fluctuating flows. The end of the Hanford Reach fry protection program is expected to end tomorrow, when the temperature units (TUs) reach 400. Today's report showed TUs at 357.

### **Fish Spill Status and Tracking:**

Jim Adams reported 98 TDG exceedances in the Snake River over the last two weeks, mainly due to high flows during the freshet. The handout provided is also located on the TMT web site. Flows are expected to drop, which will minimize exceedances, in the next day or two. Paul Wagner reported on the effects of TDG exceedances on juvenile migrants, based on gas bubble monitoring done by the Fish Passage Center. At Little Goose (representative of TDG at Lower Granite), 7% of the studied fish had gas bubble trauma. 10% of the fish were effected at Lower Monumental (representative of TDG at Little Goose), and 1-2% were effected at Rock Island. Paul summarized that, from a fish perspective, the TDG exceedances are not a serious problem.

### **Dworshak Operations:**

Rudd Turner reported on Dworshak operations over the last two weeks. There was a slight change in operations as agreed to at the last TMT meeting, due to high flows. The operation was as follows:

- 10 kcfs on 5/21 through 5/24;

- ramp down to 7 kcfs on 5/25;
- ramp down to minimum on 5/26 through today.

The current objective is to refill Dworshak by the end of June, which, according to COE forecast modeling, will occur with some water to spare. Kyle Martin said, according to his models, to expect lower than average precipitation in June, not higher. TMT members will continue to monitor the situation at Dworshak.

**Spring Treaty Fishery:**

Kyle Martin reported on two SOR's submitted after the 5/21 TMT meeting, one from CRITFC and one from the Yakama Nation, for spring treaty fisheries. Kyle provided a handout of compliance statistics for 2001 and 2002 with three different criteria (CRITFC 1' range, COE 1' range, and COE 1.5' range), using the COE's official gauge at Bonneville. No problems have been reported with any of the Spring fisheries this year. Kyle will update TMT on the number of fish caught this year when the information is available. Overall, Kyle reported that it was a "successful fishery". Rudd noted a correction, that the 5/29-5/31 1.5' range was 74-75.5', not 75-76.5', and that this change had been coordinated with CRITFC.

**Sturgeon Operations:**

Dave Wills reported that the SOR for sturgeon operations at Libby was still in rough draft. The specifics of the SOR are dependent on whether there is natural spawning of the sturgeon. An SOR is expected to be completed later this week. The COE expressed an interest in making a decision about Libby operations as soon as possible.

**ACTION:** A subgroup of NOAA, COE, USFWS, BPA, and Montana representatives will work to develop the SOR for sturgeon operations at Libby. Dave Wills will coordinate an 8:30 AM call tomorrow morning (6/5). [The sub-group agreed after TMT to convene the call at noon Thursday.] Rudd Turner will send an email with an attached SOR to TMT as soon as it is available. A conference call to discuss the SOR will be set up for TMT if necessary. He noted that 1-2 days lead time will be needed to operate any request that is put forth.

**Current Conditions:**

*Reservoir operations:* Rudd Turner and Tony Norris reported on operations at COE and BOR projects. The reservoirs are filling. Flows are beginning to recede in most places. Grand Coulee is at elevation 1277.6'.

*Fish migration status:* Paul Wagner reported that there was a good Spring Chinook run this year, for both adults and jacks. Most of the yearling Chinook were out of the system before the freshet arrived. Paul also reported high sub-yearling numbers this year. Steelhead numbers peaked during the additional flows over the last two weeks; they are now on their way out.

*Water supply forecast:* The June early bird forecast was distributed and is available on the TMT web site. Rudd reported that the June early bird is similar to the May final. The

June final should be available early next week. Rudd also provided an STP (single trace procedure) forecast for flows at Lower Granite, Priest Rapids, Bonneville and McNary.

**ACTION:** TMT needs further discussion on Dworshak operations. Ben Cope, EPA, has prepared model scenarios on Dworshak and will be asked to share them at the June 18 TMT meeting to aid in those discussions.

**Other:**

*End of Spill:* TMT discussed the end of spill date, which normally occurs on June 20. The group agreed to revisit this issue at the June 18 TMT meeting. If a decision needs to be made before that time, Paul Wagner will coordinate with TMT members.

*Lower Granite RSW:* Scott Boyd and Rudd Turner reported that due to debris problems, the RSW was opened at Lower Granite in order for it to pass. The COE then authorized a “debris removal operation” at Little Goose. Another special operation may have to be implemented further downstream to allow the debris to pass.

**ACTION:** Paul Wagner will initiate NOAA internal discussions on the Lower Granite RSW operations, considering fish passage/transport and gas level issues. He will report those discussions to Rudd Turner, who may then contact FPOM to coordinate on RSW operations. There will be an update on this at the next TMT meeting.

*Lower Monumental Operation Changes:* Rudd Turner shared photographs of Lower Monumental during high spill, showing water in areas that it is not supposed to be. As a result, operators have not been able to access certain parts of the dam and there have been a number of stranded fish observed. The COE restricted openings at end bays after coordinating the operation with NOAA. There will be an update on this at the next TMT meeting.

*Public Website Change:* Rudd Turner reported that the COE website will no longer display real time daily and hourly reports of generation data. Access to generation information will be available the following month. This action was requested by BPA due to increased power market competition. The COE is not required by statute or regulation to post real time generation data. This action will be effective on Monday, June 9.

**Next Meeting, June 18, 9am-noon:**

*Action Items:*

- Dworshak long-range operations; EPA runs
- End of Spill
- Sturgeon Operations
- Lower Monumental Update
- Current Conditions
- SORs
- Other

## **Meeting Minutes**

### ***1. Greeting and Introductions***

The June 4 Technical Management Team meeting was chaired by Rudd Turner of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Turner at 503/808-3935.

### ***2. Vernita Bar/Priest Rapids Update.***

Chris Carlson said that, for the week ending June 25, the average flow at Priest Rapids Dam was 147.5 Kcfs; for the week, the flow band ranged between 40 Kcfs and 60 Kcfs. The bands were significantly exceeded on May 22 and May 25, and slightly exceeded on May 23 and 24. Index seining took place at a total of 24 sites during the week; field personnel found a total of 22 subyearling chinook mortalities for the week. By week's end, the fish had accumulated 273 Celsius temperature units (CTUs).

For the week ending June 1, average flow at Priest Rapids was 139.3 Kcfs; the flow band ranged between 30 Kcfs and 150 Kcfs. The bands were significantly exceeded on May 29 and exceeded to a lesser extent on May 27, 28 and 31. Index seining occurred at a total of 13 sites during the week; field personnel found a total of two subyearling chinook mortalities. By the end of the week, the fish had accumulated 357 CTUs. We expect to reach 400 temperature units tomorrow, said Carlson, at which point the Hanford reach fish protection operation will end.

Kyle Martin noted that, late last Friday afternoon, Priest Rapids outflow went from 170 Kcfs+ to about 125 Kcfs. Was that just a normal drop going into the weekend? Martin asked. It occurred because of reduced power demand, Carlson replied. So this is the last Hanford reach report of the spring? Silverberg asked. Correct, Carlson replied.

### ***3. Fish Spill Status and Tracking.***

Jim Adams reported that, for the period of May 20-June 3, there were numerous (98) exceedences of the state TDG standards throughout the system due to the start of the spring freshet. Virtually all of these exceedences were Type 1, due to high runoff flows and flood control efforts. Adams noted that peak flows in the Snake are much higher this year than they were last year, up to 208 Kcfs. He added that there have been a number of exceedences of 125% TDG or higher, the highest being 133.7% at the Lower Granite tailwater on May 31. Flows in the Snake are now receding, he added, and uncontrolled spill should end by tomorrow.

Margaret Filardo said that, with respect to gas bubble trauma monitoring and the effects of this uncontrolled spill on juvenile outmigrants, 10% of the fish sampled yesterday at Lower Monumental showed signs of GBT. On May 28, 7% of the fish sampled at Little Goose Dam showed signs of GBT. Overall, said Paul Wagner, GBT has

not been observed in any of the fish sampled at Bonneville or Lower Granite to date; none of the fish sampled at Little Goose, Lower Monumental and Rock Island Dams have showed GBT signs higher than Level 1, the lowest level of trauma. Overall, said Wagner, I see little cause for concern, from a biological perspective. It appears that all of our millions of dollars of investment in flow deflectors and other gas abatement measures is now paying dividends, Scott Bettin observed.

Again, with Lower Snake flows dropping and involuntary spill levels becoming lower, we expect to return to TDG levels that are within the variance limits within a day or so, said Turner; this should be even less of a concern in the future.

#### ***4. Dworshak Operations Update.***

Turner said that, at the last TMT meeting, there was extensive discussion of the 2003 rampdown operation at Dworshak. As per that discussion, we reduced Dworshak outflow to 10 Kcfs on May 21, he said, held that through May 24, and went to 7 Kcfs on May 25. With the beginning of the Snake River freshet, flows then increased to 140 Kcfs+ at Lower Granite, so the Corps decided to reduce to minimum outflow at Dworshak one day early, Turner said. The project has been at minimum outflow since May 26, he said. Dworshak's elevation, as of midnight last night, was 1584.7 feet, filling two feet per day, with current inflows of 16.7 Kcfs, down from a peak of 22 Kcfs last week, he added. Dworshak has filled 14 feet over the past two weeks. We plan to reach elevation 1600 at Dworshak by June 30, Turner said.

Turner drew the group's attention to the Corps' most recent volume histograms, based on Dworshak's June final water supply forecast. He noted that there may be up to 111 kaf available for further flow augmentation from Dworshak during the month of June; the June final forecast for that project increased slightly (1%) over the May final WSF. Martin said his forecast indicates below-average precipitation during the month of June, so this additional volume may be on paper only.

Bonneville has referred numerous times to the fact that the Dworshak flow augmentation operation was costing ratepayers \$1 million per month, said Wagner – is that still accurate? Yes, Bettin replied – given our preference, we would have stored some of that water and brought it out later, once the recession begins.

#### ***5. Summary of Spring Treaty Fishery.***

Martin noted that two additional spring treaty fisheries have occurred since the last TMT meeting, one of which was requested by the Yakama Nation. He said that, under the criteria requested by CRITFC, Bonneville pool was in compliance only 13% of the time on an hourly basis; if the Corps' 1.5-foot operating range is applied, Bonneville pool was in compliance 53% of the time. The Dalles pool was in compliance with CRITFC's requested criteria 59% of the time; John Day pool, 35% of the time. In talking informally to a few of our fishers, said Martin, no major problems have been reported this year. He said that he will talk to personnel from the Tribal Enforcement Office to see if they have heard of any additional problems and will report back at the next TMT meeting. Martin also provided re-calculated summaries of compliance during the 2002

and 2001 treaty fisheries, revised based on the forebay gage information Turner provided at the last TMT meeting; he noted that these re-calculated tables (available via hotlink from today's agenda) should now be considered a part of the official TMT record.

## ***6. Current System Conditions.***

Turner reported that Bonneville outflow was 316 Kcfs yesterday, and 285 Kcfs this morning. Peak flows of 353 Kcfs occurred on June 1, Turner said. At McNary, day-average flow was 294.5 Kcfs yesterday; the project saw two days of 353 Kcfs on May 30-31. McNary spilled 120 Kcfs on a day-average yesterday, he said. Lower Granite flows are now receding; they averaged 149.1 Kcfs yesterday, down from a peak of 208 Kcfs on May 31. TDG levels are going down at all of the projects on the Lower Snake. The current Dworshak elevation is 1584.7 feet, 16 feet from full; the project is filling two feet per day, with inflows of 16.7 Kcfs.

Turner said Libby inflows continue to run 50 Kcfs+ with day-average outflow of 15 Kcfs; Libby has filled 22 feet over the past two weeks. Albeni Falls is at elevation 2059.7 feet and filling; the project has filled four feet in the past two weeks. We expect to hit 2062 feet by the end of June, possibly earlier, he said. Tony Norris said Grand Coulee elevation is currently 1277.6 feet; Hungry Horse; 3545.5 feet and filling 1.5-2 feet per day. We plan to reduce outflow from that project by one unit next week, although we may need to come back up in order to avoid fill and spill, he said. There are currently three units available at that project, he said, with one unit down for annual maintenance.

Moving on to the current status of the adult spring chinook migration, Wagner said that, at Bonneville, the count to date is just over 201,000 fish, second only to the 2001 and 2002 counts. 2003 jack counts, an indication of future run strength, show 15,000+, about the same as the 2001 count and second only to the 2000 count of 22,000 jacks.

With respect to the status of the juvenile fish migration, Wagner said combined yearling chinook indices at Lower Granite peaked before the freshet began; the peak index of 61,900 occurred on May 27. The indices at Little Goose, however, are continuing to increase; indices also continue to be strong at the Lower Columbia projects. With respect to subyearling chinook, Wagner said the indices continue to increase at Lower Granite and McNary. Steelhead indices increased dramatically at Lower Granite in response to the onset of the freshet, and are now decreasing.

Is there a chance that we could reach the 95% passage point before June 20? Bettin asked. The Fish Passage Center is predicting we will reach the 95% point of the run by June 17, Wagner replied, but there are a lot of questions about the value of transporting such small fish. We will discuss the end of spill at the three Snake River collector projects at the June 18 TMT meeting, Wagner said; we may choose to end spill at that time, or wait until the planning date of 6 a.m. on June 20. We'll put that on the agenda for next TMT meeting, Silverberg said.

The June early-bird water supply forecast is now available, Turner said; it is pretty close to the May final forecast – 89.3 MAF at The Dalles, 83% of normal, down

from 90.2 MAF in the May final. The June early-bird forecast shows 17.7 MAF at Lower Granite, again down slightly from the May final. The Dworshak forecast increased by about 1% over the May final. We expect to have the June final forecast by early next week, Turner said; overall, we don't expect any significant changes compared to the May final forecast. Turner also drew the group's attention to the most recent STP run; he noted that it is getting closer to the Water Supply Forecast. He said the action agencies believe flows have now peaked in the Snake River; Lower Columbia flows may also have peaked last weekend, but there is still a significant residual volume in that basin, so flows are not expected to recede as quickly at the Columbia River projects as they will at the Lower Snake projects. Turner suggested that a discussion of the long-range Dworshak operation be placed on the agenda for the June 18 TMT meeting; it was so agreed.

### ***7. Request for Sturgeon Operations at Libby.***

David Wills said he has a preliminary draft of the Fish and Wildlife Service's sturgeon SOR; this draft is not yet ready for formal discussion, however. The basic premise of the SOR is still the same – the first choice would be to use the 800 kaf to enhance natural spawning, but there is no indication, as yet, whether or not natural spawning has occurred.

When will you know? Turner asked. What they're looking for as a trigger to indicate successful natural spawning is an abrupt movement of these fish downstream – five to 20 miles, Wills replied. If there is consensus that natural spawning has occurred, we will contact the Corps to request that the flows begin; we're trying to work that language into the SOR. If natural spawning does not occur, he said, we will request that the 800 kaf be released later in the season, for the benefit of the outplanted fry.

Wills suggested that a TMT subgroup, including himself, Wagner, Chris Ross, Bettin, a Montana representative and a Corps representative, meet later this week to flesh out the sturgeon SOR. Turner noted that Libby outflow has now been increased to 15 Kcfs, and will likely need to go higher for flood control and to avoid filling and spilling. It would help if we could have an idea of what the sturgeon needs are going to be as soon as possible, he said, to allow us to operate Libby as smoothly as possible. If the project reaches full while we still have 50 Kcfs inflow, as we do currently, that would be a major problem, Turner said.

So will the TMT members receive an email? Silverberg asked. We will send out the SOR as soon as it's available, Wills replied. And at that point, there could be a conference call, if conditions warrant? Silverberg asked. Correct, was the reply.

Currently, we're planning to hold 15 Kcfs for another day, then ramp up to 22 Kcfs Libby outflow by June 9, Turner said. We would then hold that flow through June 26, then ramp down to 16 Kcfs. We are watching inflows to the reservoir, Cathy Hlebechuk added; if inflows increase more rapidly than expected, we may need to ramp up sooner. Libby elevation was 2442.5 feet as of midnight last night, 16 feet from full, Turner added.

## **8. New System Operational Requests.**

No new SORs were submitted prior to today's meeting.

## **9. Recommended Operations.**

Recommended operations were summarized during a previous agenda item.

## **10. Other.**

**A. Changes to Public Website.** Turner said there a number of FTP websites on which hourly generation data at the FCRPS projects is made available; at BPA's request, we're going to be blanking that information out, he said. The columns that will be blanked out include gross generation, station service megawatts, unit status and surplus generation data. On the 7<sup>th</sup> of next month, we will put the information up for the previous month, he said. Therefore, it will become available, just not in real time. The reason for the change is the increasingly competitive nature of the energy business, Turner said. VE, VC and VU also will be deleted from the data query function, Turner said; this change will be in effect beginning Monday, June 9.

**B. Lower Granite RSW Operations.** Turner noted that currently a large volume of debris is moving down the Snake River; this could have an impact on the operation of the Lower Granite RSW. Scott Boyd said the RSW was operated for a couple of hours last week to pass debris; another debris-passage operation involving the RSW and full-flow operation of Spill Bay 4 at Lower Granite is taking place today. Turner said field personnel are concerned about the number of debris-related injuries that are being seen in juvenile outmigrants; the Corps subsequently authorized spill through Little Goose Spill Bay 2 to help pass the debris downstream last night. Most of that debris is now on its way down to Lower Monumental, Turner said. The problem is that some of the Snake River tributaries have seen higher flows this year than they have for the past several years, Turner said; that's the likely source of that debris.

The group also discussed the continuing operation of the Lower Granite RSW to reduce TDG levels below that project; our preference would be to operate the RSW plus training spill, Bettin said. In my opinion, said Turner, TMT's expertise is more on the system, rather than the individual project, level; we should probably ask FPOM to develop a recommendation as to the optimum Lower Granite operation. Our interest is to keep gas levels as low as possible, said Wagner; there is some question about whether we want to move more fish in-river, or transport them. So is there more coordination that needs to occur? Silverberg asked. Yes, Bettin replied, if we want to make changes to the Fish Passage Plan. There is general agreement that FPOM is the group through which to coordinate that decision, Wagner said. We will frame up a question for FPOM laying out our objectives for the last two weeks of spill, Bettin said. We'll talk about that at NMFS and get back to you later today, Wagner said.

**C. Changes at Lower Monumental.** Turner put up a series of photos taken at Lower Monumental last Friday, showing the spill pattern with the new end-bay flow deflectors in place. He noted that water has been splashing up onto the project's tailrace

access ramps; at least two adult fish have been found on the ramps since spill began. As a result, Turner said, we have instructed the project to restrict spill somewhat to avoid that splashing effect. What we're finding is that at spills of 70 Kcfs or above, we're seeing that splashing effect; we've now gone to a two-stop restriction at the end bays, with the remaining spill divided equally among the other bays, he said. What we're likely going to need to do is construct walls along the spillway to keep the water in the river, Bettin said. We may also need to go to a crown spill pattern, with limited spill on the end bays and the majority of spill in the center bays, Turner said, which could result in additional TDG issues downstream. Turner added that the current end-bay spill restriction is a short-term fix only. It was agreed to revisit this issue at the next TMT meeting.

***11. Next TMT Meeting Date.***

The next meeting of the Technical Management Team was set for Wednesday, June 18. Meeting summary prepared by Jeff Kuechle, BPA contractor.

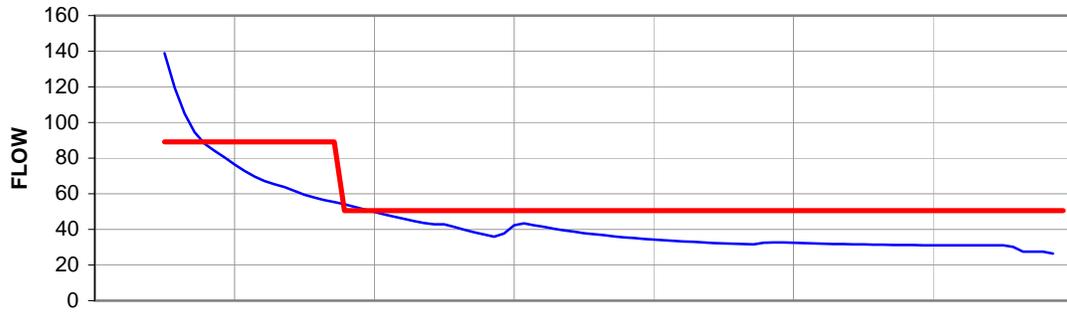
TMT PARTICIPANT LIST

JUNE 4, 2003

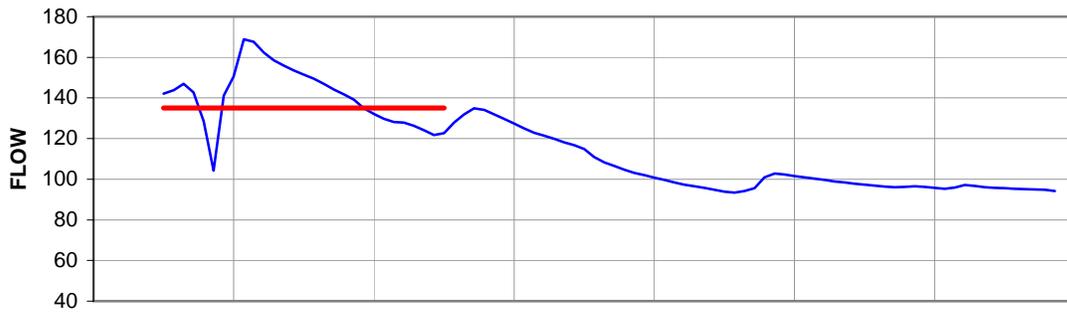
Name	Affiliation
Rudd Turner	COE
Donna Silverberg	Facilitation Team
Paul Wagner	NOAA Fisheries
Scott Bettin	BPA
Tony Norris	USBR
Nick Lane	BPA
Jim Adams	COE
Steven Wallace	PacifiCorp
Scott Boyd	COE
Mary Karen Scullion	COE
Margaret Filardo	FPC
Lance Elias	PPL
Chris Carlson	Grant County PUD
Tom Le	PSE
Russ George	WMCI
Kyle Martin	CRITFC
Robin Harkless	Facilitation Team

David Benner	FPC
Richelle Beck	D. Rohr & Associates
Sean Cradell	NW Energy Consultants
Kevin Nordt	PGE
Tim Heizenrater	PPM
Cathy Hlebechuk	COE
Laura Hamilton	COE
Tom Haymaker	PNGC
Colin Beam	PPM
Mike Butchko	Powerex
Martin Hatch	Seattle City Light

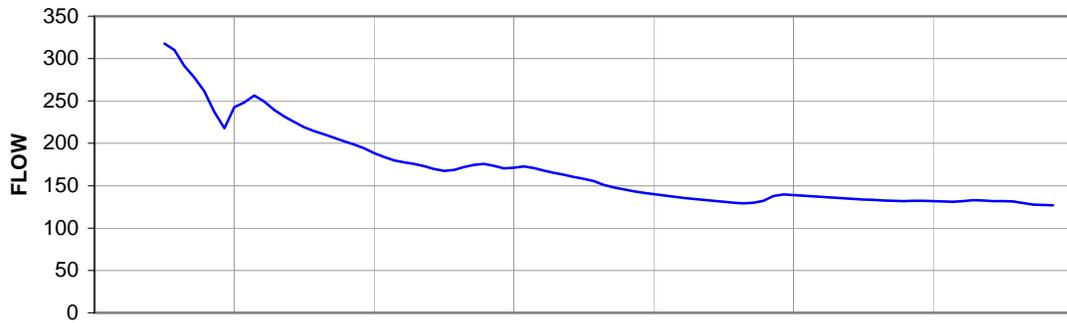
LOWER GRANITE FLOW



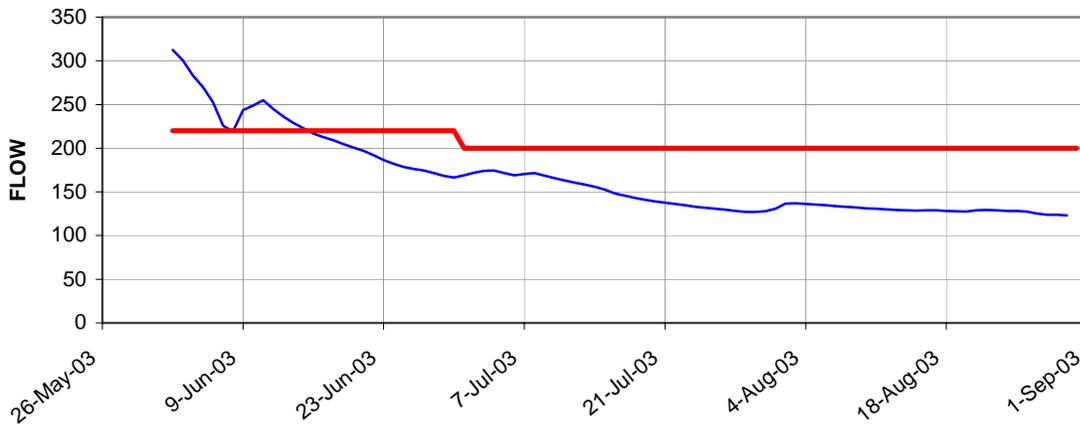
PRIEST RAPIDS FLOW



BONNEVILLE FLOW



MCNARY FLOW



# TECHNICAL MANAGEMENT TEAM

**BOR:** Tony Norris / Lori Postlethwait

**BPA:** Scott Bettin / John Wellschlager

**NMFS:** Paul Wagner / Chris Ross

**USFWS:** David Wills / Howard Schaller

**OR:** Ron Boyce

**WA:** Shane Scott

**ID:** Steve Pettit

**MT:** Jim Litchfield

**COE:** Cindy Henriksen / Rudd Turner

## TMT MEETING

**18 June 2003      0900 - 1200 hours**

**Custom House      Room 118  
Portland, Oregon  
Conference call line: 503-808-5190**

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*All members are encouraged to call Donna Silverberg with any issues or concerns they would like to see addressed.  
Please e-mail her at [dsilverberg@cnnm.net](mailto:dsilverberg@cnnm.net) or call her at (503) 248-4703.*

## AGENDA

1. Welcome and introductions.
2. Fish spill status and tracking. (COE)  
[\[High 12hr Averages\]](#) [\[Exceedence Tracking\]](#)
3. Libby sturgeon update ([SOR #2003-10](#) ). (USFWS)
4. Lower Monumental spill update. (COE)
5. [Debris](#) operations update. (COE)
6. Dworshak summer operations. (NOAA Fisheries) [\[EPA Snake Graphs\]](#) [\[Snake Summer 2003\]](#)   
[\[dworshak2003\\_45.xls\]](#) [\[dworshak2003.xls\]](#) [\[LSNK\\_sum2003.pdf\]](#) [\[LSNK\\_SUM2003bc.pdf\]](#)  
[\[2002 Dworshak Summer Operations Report\]](#) [\[dwor-temp-profile\]](#) [\[dwor-release-calcs\]](#)
7. Review current system conditions.
  - fish migration status (NOAA Fisheries, USFWS)
  - [reservoir operation](#), power system, water supply (COE, BOR, BPA) [\[DWR\]](#) [\[HGR\]](#) [\[LIB1\]](#) [\[LIB2\]](#)
8. End of spill at collector dams.
9. McNary transportation start.
10. Review [operations requests](#).
11. Develop recommended operations for 23 June - 6 July.
12. Other.
  - set agenda for next meeting

*Questions about the meeting may be referred to Cindy Henriksen at (503) 808-3945, or Rudd Turner at (503) 808-3935.*

### Figure B: Dworshak Release Scenarios

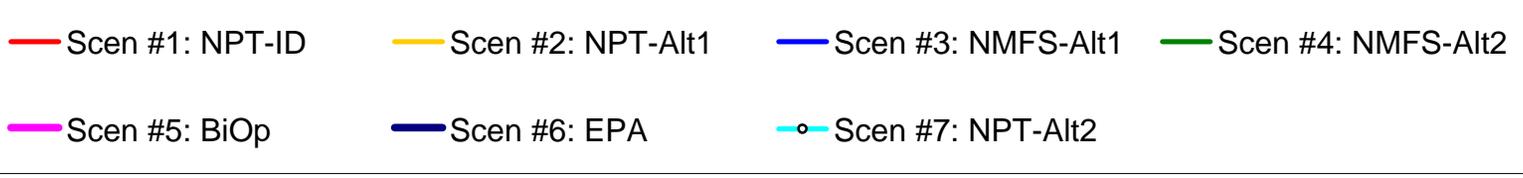
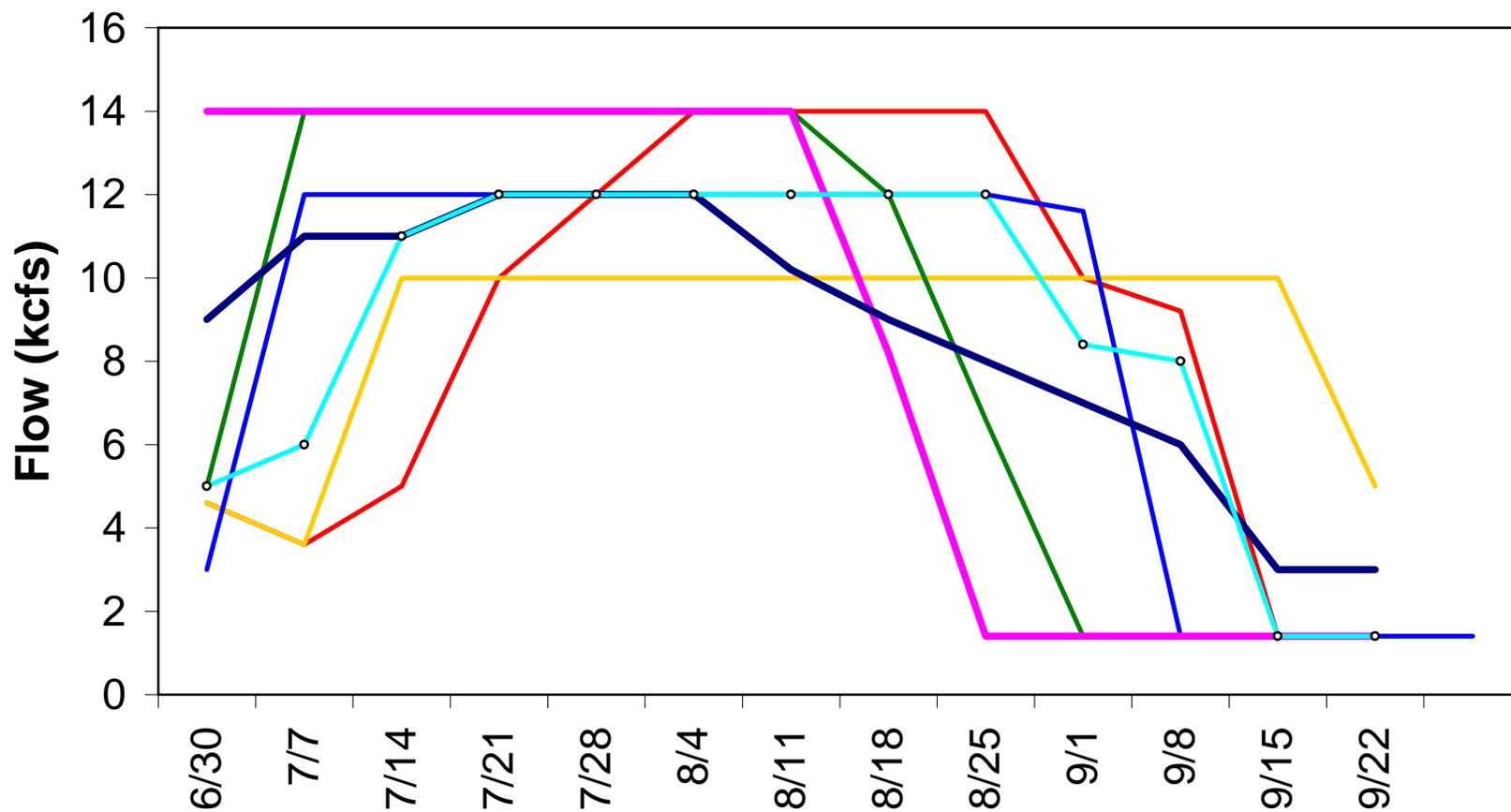
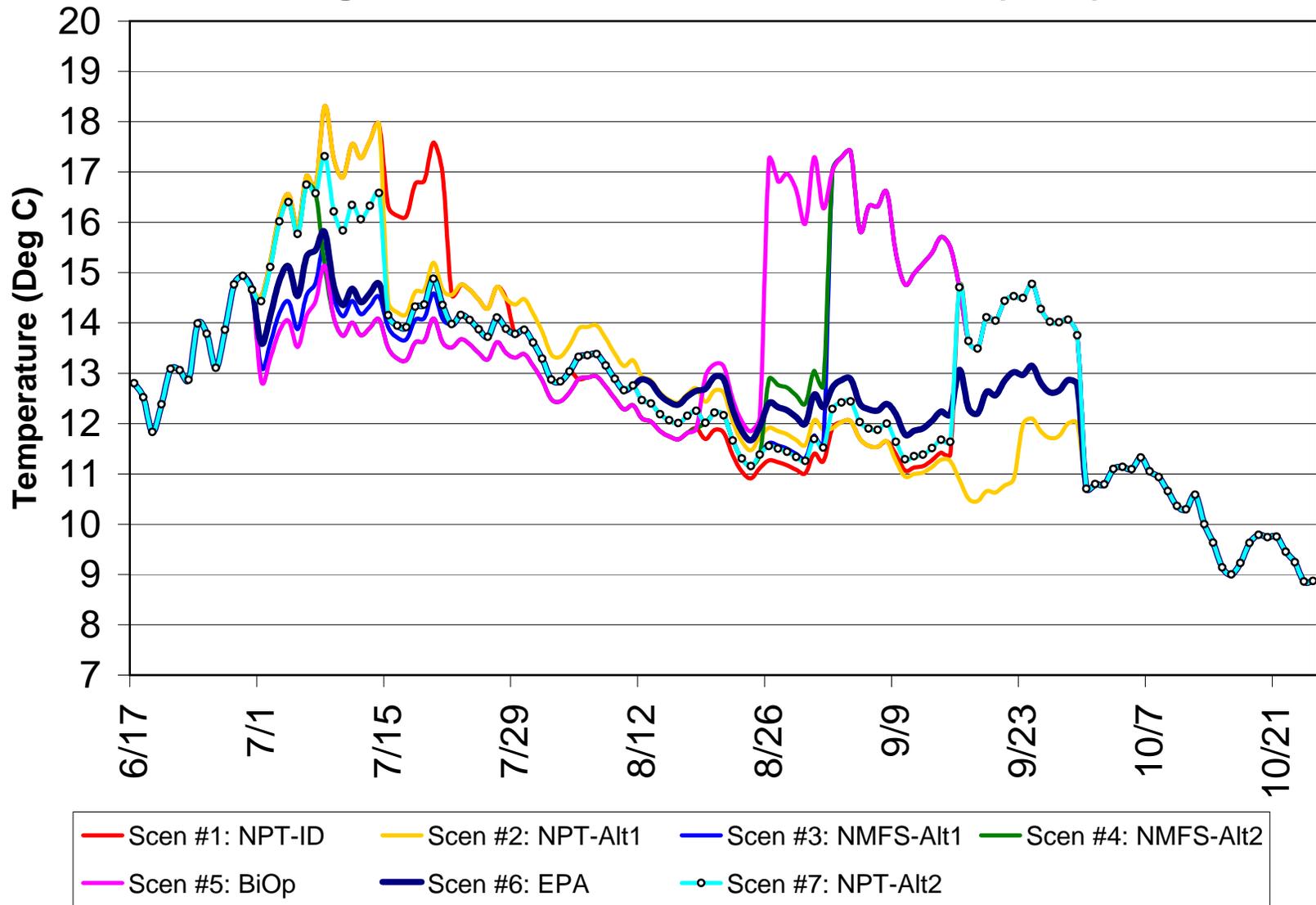


Figure 1: Clearwater River at Mouth (RM1)



**Figure 2: Lower Granite Dam (RM107)**

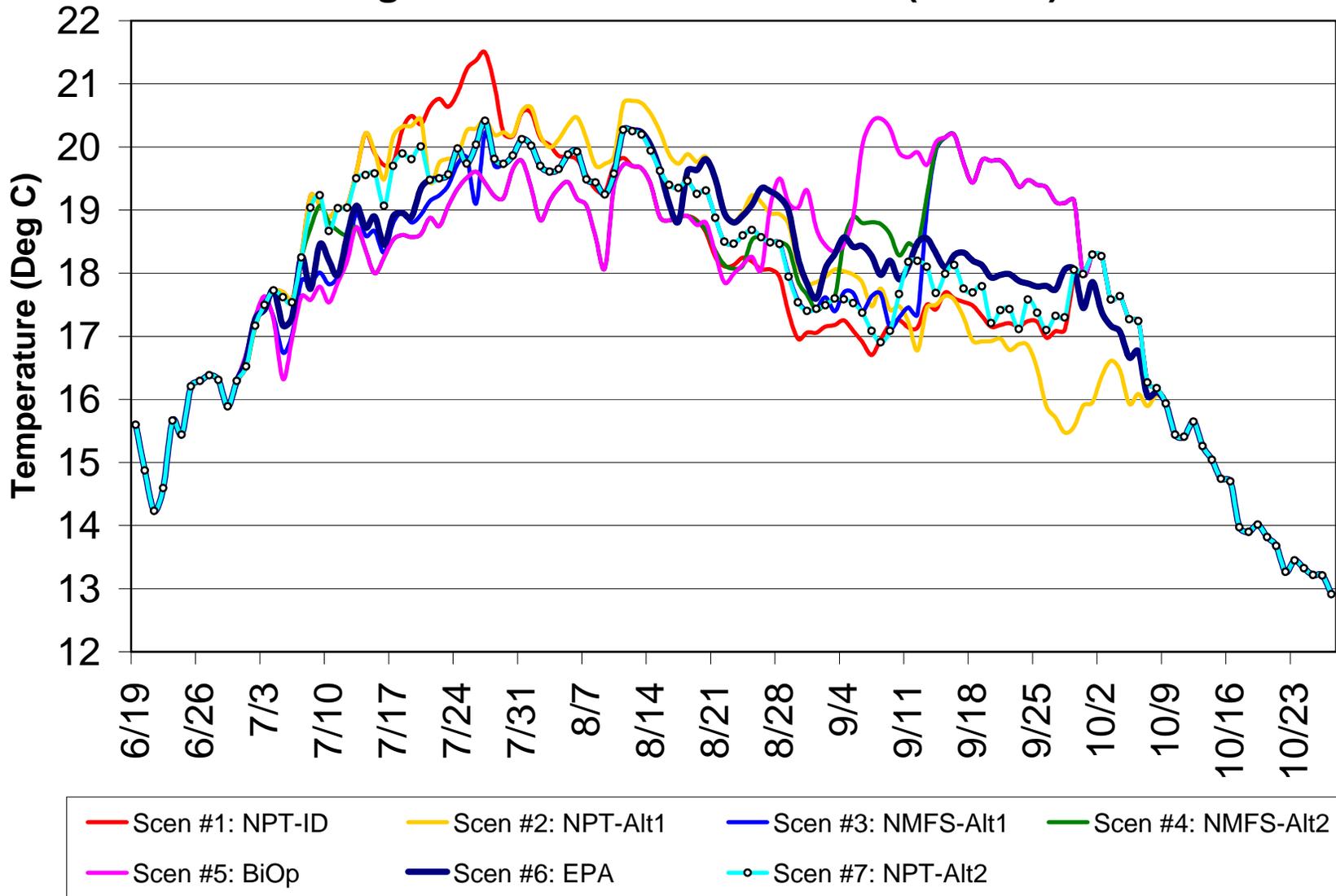
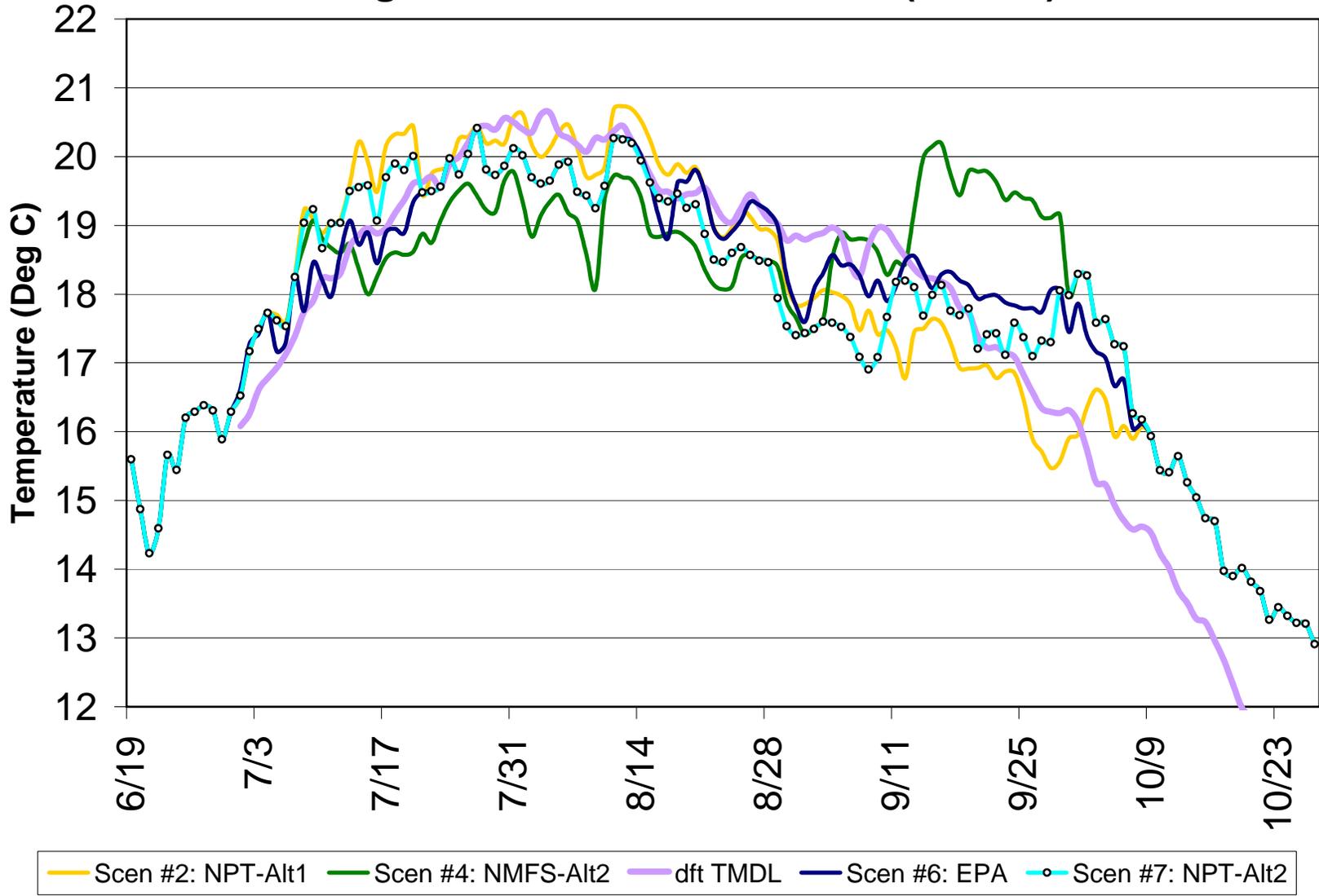


Figure 3: Lower Granite Dam (RM107)









# COLUMBIA RIVER REGIONAL FORUM

## TECHNICAL MANAGEMENT TEAM MEETING NOTES

June 18, 2003

CORPS OF ENGINEERS NORTHWESTERN DIVISION OFFICES – CUSTOM  
HOUSE  
PORTLAND, OREGON

TMT Internet Homepage: <http://www.nwd-wc.usace.army.mil/TMT/index.html>

# DRAFT

## FACILITATOR'S SUMMARY NOTES ON FUTURE ACTIONS

Facilitator: Donna Silverberg

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

### **Fish Spill Status and Tracking:**

Laura Hamilton, COE, reported that there were 60 total TDG exceedances during June 3-16. The exceedances, she reported, were due to high runoff flows/flood control, high TDG levels from Ice Harbor, and when using best professional judgment. The handout she reported can also be found on the TMT web page.

### **Libby Sturgeon Update:**

Dave Wills, USFWS, reported that a task force consisting of representatives of the COE, BPA, USFWS, NOAA and Montana drafted an SOR during a conference call on 6/5 and began counting sturgeon spawning. Operations for sturgeon began on 6/6, to full powerhouse and have continued since then. During today's discussions, the COE expressed that they would like to drop outflows to 19.4 kcfs on 6/19 through 6/26 in light of residual runoff (the theoretical volume of runoff volume remaining on the mountain). On 6/26, drop to 17 kcfs through July and August with the objective of drafting Libby to 2439' by the end of August. Oregon expressed a desire to draft Libby as much as possible for salmon in August.

**ACTION:** Per Montana's request, the COE will model the NWPPC strategy to operate Libby so that it is 10' from full by the end of August and the end of September while attempting to avoid fill and spill. These scenarios will be presented at the next TMT meeting.

**ACTION:** TMT agreed to the following two-week operation at Libby: drop from five to four units tonight (6/18); then to three units on 6/26 (roughly 14.5 kcfs out) until at least 7/6. TMT will revisit the issue at the July 2 TMT meeting. If there is a change,

there will be a TMT call on 6/26. The COE and others expressed a desire to avoid a fill and spill scenario similar to last year.

**Lower Monumental Spill Update:**

Rudd Turner, COE, updated TMT on problems that occurred at Lower Monumental due to high spills. The COE is developing a cost estimate for the construction of two walls to help solve the problem, which will be presented to SCT. If construction is not completed next year, there may need to revise the spill pattern at Lower Monumental.

**Debris Operations Update:**

Rudd Turner provided photos and updated the group on debris operations at Lower Granite. The RSW was used on June 10 for twelve hours to pass the debris. A debris operation may be necessary at Little Goose in the near future. High levels of TDG resulted from fully lifting the gate to pass the debris that did arrive at Little Goose; the COE shorten the operation to reduce TDG impacts. There will be an update on this issue at the next TMT meeting.

**Dworshak Summer Operations:**

Kyle Martin, CRITFC, presented an overview, with handouts, of seven proposals for Dworshak operations – one from Nez Perce/Idaho, two from Nez Perce, two from NOAA, the Biological Opinion plan, and an EPA water quality-driven alternative. All the information in the handouts can be found on the TMT web page. NOAA suggested using in-season management to keep temperatures low. The Salmon Managers will review the proposals at their next meeting and will develop an SOR that will likely accommodate July 4<sup>th</sup> weekend recreational uses before drafting. Idaho requested that Dworshak be filled as soon as possible instead of waiting until 6/30. TMT will revisit this issue at the July 2 meeting. Appreciation was expressed to Ben Cope, EPA, for his work on the model.

**ACTION:** For the next two weeks, the project will continue to fill and pass inflow until TMT recommends a summer operation.

**Review Current System Conditions:**

*Fish migration status:* Paul Wagner reported that yearling Chinook are on the decline; subyearlings are at a count of 680,000 to date and ahead of schedule; steelhead are nearing the end of passage with a seasonal total of 3.3 million; adults had a good year; and jack counts look ‘promising’. NOAA expressed that passing fish through spill this year seems to be good for subyearlings.

*Reservoir operations:* Rudd Turner and Tony Norris reported on operations at COE and BOR projects. The reservoirs are filling. A spill test at BPA will end on 6/28. Tony will update TMT on Grand Coulee fill at the next meeting.

*Water supply forecast/power:* Rudd Turner reported that the June final water supply forecast is out, with not much change from May. Scott Bettin, BPA, reported that there was a problem at the west of Hatwai due to lightning, but that it is now under control.

**End of Spill at Collector Projects:**

At the last meeting, TMT members agreed to a tentative June 20, 6 am, end of spill date. NOAA does not want to start transport at this point, considering there are still spring-like conditions. There will be a check-in at next week's FPAC meeting, after which transport operations will be coordinated with the COE. Paul Wagner and Rudd Turner will be the NOAA Fisheries and COE contacts on this.

**Other:**

*Lower Granite:* Rudd Turner reported that there was a frozen valve at the Lower Granite juvenile fish bypass pipe that may effect future operations. The COE is waiting for a replacement part and, for now, is operating the bypass as usual. BPA stated that a zero flows operation might be requested while the part is installed. This issue will be revisited at the next TMT meeting.

*Ice Harbor:* Rudd Turner reported that there have been recent conference calls to discuss summer spill at Ice Harbor and injuries to fish that may be due to the spill pattern. The COE and NOAA Fisheries have conducted a study on an alternative spill pattern, and would like to do a summer test with 48-hour blocks for test conditions. Shane Scott, Washington, provided statistics on fish injuries and survival rates showing abnormally high injury rates for the last two years. An update on the study will be provided at the next TMT meeting.

**Next Meeting, July 2, 9am-noon:**

Agenda Items:

- Fish Spill Status and Tracking
- Libby and Hungry Horse Operations and Models; NWPPC Strategy
- Sturgeon Update
- Dworshak Summer Operations – Decision
- Hungry Horse Draft Update
- Transport Update
- Lower Granite Bypass Pipe Update
- Ice Harbor Spill Test Update
- Other

## **Meeting Minutes**

### ***1. Greeting and Introductions***

The June 18 Technical Management Team meeting was chaired by Rudd Turner of the Corps and facilitated by Donna Silverberg. The following is a distillation, not a verbatim transcript, of items discussed at the meeting and actions taken. Anyone with questions or comments about these minutes should call Turner at 503/808-3935.

### ***2. Fish Spill Status and Tracking.***

Laura Hamilton drew the group's attention to the Corps' most recent Exceedence Tracking report, for the period June 3-16. She noted that there were a total of 60 water quality standard exceedences during this period, most of which were either Type 1 (due to high runoff flows and flood control efforts), or Type 6 (due to uncertainties when using best professional judgment to apply the spill guidance criteria). The Lower Monumental forebay, Ice Harbor forebay, McNary forebay and Camas/Washougal stations were the main locations at which these exceedences occurred. There were also some Type 11/12 exceedences, due to high TDG levels coming from upstream projects or sharply rising (+3-5 degrees C) water temperatures. TDG levels are now beginning to subside throughout the system, Hamilton said; all of these exceedences occurred prior to June 10.

So high flows caused most of these exceedences? Paul Wagner asked. That's correct, Hamilton replied – at McNary, for example, we kept backing off spill, but because the gas levels coming down from Ice Harbor were so high, we had a series of exceedences at McNary from June 3-9.

### ***3. Libby Sturgeon Update.***

On June 6, the Fish and Wildlife Service submitted SOR 2003-10. This SOR requested the following specific operations:

- From June 5-June 26, attempt to maintain discharge target from Libby Dam of 20 Kcfs.
- Sturgeon augmentation flows should be followed by rampdown to the tiered bull trout minimum flows/salmon flows per the 2000 BiOps, except as noted below.
- Avoid forced spill at Libby.
- Refill the project to near 2459 feet by July 1 or later if needed to avoid forced spill.
- If on June 26 additional water is available, we recommend splitting the volume equally to extend the then current target sturgeon incubation flow beyond June 26, and to achieve a higher tiered bull trout flow through July, if possible up to the optimum tiered flow of 9 Kcfs.

This SOR was received following the June 4 TMT meeting, said Turner; as you may recall, we formed a TMT subgroup, which met by conference call on June 5, to discuss this issue. At that meeting, he said, the subgroup discussed the need to bring Libby outflows up to avoid filling and spilling at that project; within an hour or two of the end of that meeting, we learned that field personnel had found sturgeon eggs on the mats, indicating successful spawning, and made the decision to increase Libby outflow to 25 Kcfs on the evening of June 5. We have been operating the project at pretty much full powerhouse capacity since then, Turner said, although there have been some transmission system and weather-caused curtailments during the intervening period.

Libby inflows are now on a downward trend, Turner said; there is still some residual water volume remaining in that basin, but we're planning to drop to four units outflow from Libby beginning at midnight tonight. In response to a question, Turner said the Corps estimates that 43% of the residual April-August volume above Libby has yet to

make it down to the project. We're trying to not fill too quickly, to smooth the operation so that we get close, but not too close, to full by late June/early July, Turner said. The model shows a maximum elevation of about 2455 feet. Current inflow to the project is 30 Kcfs, he added.

Turner said four units at Libby will yield 19.4 Kcfs outflow; the Corps plans to hold that operation through June 26. At that point, he said, model runs show we can drop to 17 Kcfs, and hold that flow through July and August. The objective of the 17 Kcfs is to get to elevation 2439 by the end of August, without a double peak, he said; the TMT can talk about that operation, but that's what we've come up with in our model run. Turner added that Libby won't quite reach elevation 2459 under this operation -- 2455 will be the maximum elevation in 2003.

Not filling is a consequence of providing the sturgeon flow volume in June, although, again, we don't want to fill and spill at Libby, Turner said. We could fill by early July if that's the TMT's desire. Julie Ammann said it would be possible to go to a discharge of 14 Kcfs-15 Kcfs after June 26 if the desire is to refill Libby, but it would then be necessary to increase outflow to 19 Kcfs to draft to 2439' by 31 August, she said. We could monitor inflow to the project and increase discharge if it looks as though filling and spilling is becoming more likely, Scott Bettin said.

The group devoted a few minute of discussion to the desired operation at Libby; ultimately, the TMT recommended that the action agencies reduce Libby outflow to three units (a little under 15 Kcfs) on June 26. Turner said the Corps will tentatively agree to this operation, but will monitor the Libby inflow situation closely. We'll let you know if it becomes necessary to increase Libby discharge, Turner said. Jim Litchfield requested that the Corps model the strategy, recommended by the Council, of a straight draft to 10 feet from full (2449 feet) at Libby by August 31 and September 30. We will provide those model runs at the TMT's July 2 meeting, Turner said. In response to a suggestion from Bettin, Litchfield said he will raise the issue of the 10-foot draft at Libby at the July 3 IT meeting.

#### ***4. Lower Monumental Spill Update.***

Turner reminded the group of the photographs he had shown at the last TMT meeting, showing the spill problems during high flow periods at Lower Monumental; he noted that the spill restriction of 2 stops or less at spill bays 1 and 8 remains in effect. The District is now discussing the possibility of constructing parapet walls to contain the spill at the project this winter, and will be submitting an FY'04 funding request to SCT to allow that work to proceed, Turner said. You will recall that, during peak flows in the Snake River, when spill was in the 80 Kcfs range, spill was coming up in waves onto the tailrace deck below the project, creating some very hazardous conditions for workers and washing both juvenile and adult fish up onto the deck. It's not a problem right now, as spill at Lower Monumental has decreased to about 40 Kcfs, but it could be a problem again next year, Turner said.

#### ***5. Debris Operations Update.***

Turner reported that last week in particular, as another consequence of the high flows in the Snake, debris from the tributaries caused fairly serious problems at the Lower Snake projects, starting with Lower Granite where several acres of debris accumulated rapidly. Debris passage operations were initiated with the RSW at that project beginning June 9, operating the RSW for three hours. On June 10 it operated for 12 hours, which got about 95% of the debris through the project. Somewhat surprisingly, much of that debris hasn't really shown up at Little Goose yet, Turner said, but we do expect it to arrive soon, at which point we'll likely need to initiate debris passage operations at that project.

We did run into some problems when we opened up Little Goose Spill Gate 2 all the way, Turner said; this operation increased TDG to 140% below the project. We now have a protocol in place which restricts that operation to 30 minutes, so we're seeing short-term TDG increases which then go back down. We also pulled the spilt-beam transducers at the Ice Harbor spillway in anticipation of the debris' arrival at that project, because those units cost about \$10,000 apiece, and can be damaged or torn away by passing debris, he said. There are also concerns about the damage debris can cause to the spillway seals and hazards to recreational boaters, so we're monitoring the situation closely, Turner added. Steve Pettit noted that trees up to 120 feet long have been seen floating past Lewiston this spring. Turner added that the next project at which it will be possible to remove a significant amount of debris from the river is McNary. He also noted that the Corps' debris-removal capability has been reduced in recent years. Turner agreed to provide a further update at the next TMT meeting.

#### ***6. Dworshak Summer Operations.***

Kyle Martin said the salmon managers had looked at seven potential Dworshak operations this summer, including the Nez Perce Tribe/Idaho plan (pass inflow for much of July, then ramp up to 14 Kcfs Dworshak outflow, leaving 200 kaf for use in September). Under another scenario modeled, Dworshak would release a flat 10 from July 14 through September 15. We also modeled a flat Dworshak outflow of 12 Kcfs through July and August, Martin said; another alternative was to begin releasing 14 Kcfs on July 7, hold that flow through August 17, then ramping gradually down to minimum outflow by August 31.

We then asked Ben Cope of EPA to model Dworshak outflow, said Martin; Ben used the EPA model to develop an operation that will give us the most bang for our buck, cooling-wise. Ben suggested that we ramp up to 9 Kcfs at the end of June, then to 12 Kcfs by July 18, holding that flow through the mid-August, at which point Dworshak outflow would be ramped down to 8.7 Kcfs. The EPA plan would then release an average of 4.8 Kcfs from Dworshak during the month of September. Another alternative, NPT #2, would release 6 Kcfs from Dworshak through July 13, ramp up to 11 Kcfs for one week, to 12 Kcfs through August 31, then hold 8 Kcfs from Dworshak through mid-September.

Martin provided a few more operational details about these various scenarios, including the expected number of exceedences of the 20 degree C standard for each of these alternatives. Wagner then described the anticipated temperature effects of each of these alternatives through the season. Essentially, said Wagner, all of these operations are

on the table at this time; we'll just have to see how the temperature situation plays out. Martin then described the weather condition assumptions used in developing these model runs.

He said Dave Statler of the Nez Perce Tribe was not available for yesterday's FPAC meeting; we would like to discuss the Dworshak operation further at next week's meeting, once Dave is available, and develop a Dworshak SOR for discussion at the next TMT meeting. In the interim, the salmon managers recommended that Dworshak be allowed to fill, then pass inflow, at least through July 6, unless conditions change significantly. We are currently within 2-3 feet of full at Dworshak, Julie Ammann said. We'll touch full, then try to maintain that elevation by passing inflow, Bettin said. At Pettit's request, Turner and Ammann said the Corps will look at the possibility of filling Dworshak sooner than June 25 in order to maintain a full pool for as long as possible.

What about the scenarios that show Dworshak outflow ramping up as early as June 30? Turner asked. Are we saying that's not going to happen? We won't be requesting that Dworshak outflow be increased before the next TMT meeting on July 2, unless conditions change drastically in the interim, Wagner replied.

### ***7. Current System Conditions.***

Wagner said yearling chinook numbers in the Lower Snake are now declining; the wild indices continue to hold as a higher proportion of the total outmigration than we've seen in recent years, however. We're seeing indices in the 50-fish range at Little Goose, currently, Wagner said. Ron Boyce noted that it is as important to protect the tail end of the outmigration as it is the higher numbers at the beginning of the run.

Subyearling chinook indices are where the real action is, at this point, Wagner said; we've seen 680,000, year-to-date, and an average daily index of 32,000 – that's much higher than anything we've seen in recent years. We think it's a good thing that the majority of these fish are passing through spill, Wagner added; in-river conditions are still good, with respect to flow and water temperature. With respect to steelhead, Wagner said steelhead passage is nearly over, although the indices are still running in the 2,000 fish per day range at Lower Granite.

With respect to adult passage, 2003 was another excellent year, although it was not a modern record, Wagner said. Jack returns also look good this year, with more than 18,000 past Bonneville year-to-date. That bodes well for next year's adult returns, Wagner said; if you'll recall, we only saw 8,800 jacks past Bonneville in 2002, but got a large number of five-year-old chinook back in 2003, which made the overall adult run better than expected. We don't know why that occurred, said Pettit; I've never seen such a large five-year-old run in my 30-year career. Pettit noted that 78% of the fish passing Lower Granite Dam in 2003 were five-year-olds. Essentially, we got lucky, he said – the large number of three-salt fish offset the low number of returning four-year-old fish from the 2001 outmigration.

Moving on to reservoir operations, Turner said Lower Columbia flows are holding steady in the mid-200 Kcfs range, although flows have declined from the peak

during the spring freshet. The day-average flow was 281.8 Kcfs at Bonneville yesterday; flows have ranged between 244 Kcfs and 316 Kcfs over the past two weeks. Turner said the spill test at Bonneville will end on June 28 and June 26 will be the last day of daytime spill to the TDG cap. Yesterday's day-average flow at McNary was 255 Kcfs; flows at that project have averaged 279 Kcfs since June 1. Water temperatures in the Lower Columbia are increasing, Turner said. Camas-Washougal temperatures were 62 – 64 deg. F. yesterday, while McNary temperatures were 61 – 66 deg. in the Oregon forebay, 62 – 64 deg. in the Washington forebay, and 61.5 – 62.8 deg. F. in the tailrace. These data are from the fixed monitoring sites. Day-average flow at Lower Granite was 83 Kcfs yesterday, and has averaged between 81 Kcfs and 149 Kcfs over the past 2 weeks. Flows are receding from the peak in mid-June, he said. Dworshak was at elevation 1597.2 feet as of midnight last night, with 5.9 Kcfs out. Dworshak has filled 11 feet in the past two weeks; the project is expected to reach full (elevation 1600) by June 30. Libby is currently at elevation 2452 feet, 7 feet from full, with outflows of 24.3 Kcfs and inflows of 30 Kcfs. Albeni Falls is at elevation 2061.7 feet and releasing 35 Kcfs, getting close to its summer operating range of 2062.0 – 2062.5 feet.

Tony Norris reported that Hungry Horse was at elevation 3554.5 yesterday with one unit operating; the project is filling half a foot per day. Grand Coulee is at elevation 1283.6 feet, and will be filling slightly over the next several days; the project is expected to fill by the July 4 weekend. With respect to the power system, Bettin said everything is currently under control, but West of Hatwai has been a problem in recent weeks, primarily due to lightning strikes curtailing transmission capacity.

Norris said he will provide some model runs showing the 20-foot draft from Hungry Horse this summer; in response to a question from Litchfield, Pat McGrane said Hungry Horse would need to release 6.6 Kcfs through the end of August to achieve a 20-foot draft; a 10-foot draft would yield about 4.5 Kcfs through the end of August, while a 10-foot draft by September 30 would yield about 3.7 Kcfs. Any major changes on the Upper Snake River volume forecasts? Boyce asked. It looks as though we should have about 280 kaf to work with, Norris replied; flow augmentation from the Boise started last Friday, and should total 60 kaf this year. What about Flathead Lake? Chris Ross asked. It's essentially full right now, Norris replied.

The June final Water Supply Forecast was issued on June 9, said Turner; there isn't much change from the May final. The Dalles water supply is down 1% compared to the May final forecast; Grand Coulee is 88% of normal, the same as it was in the May final. The COE June final forecast shows Libby April-August runoff volume at 5.13 MAF, 82% of normal, down 1.5% from the May final. The COE new April-July runoff volume for Dworshak is 2.37 MAF, 90% of average, up 1% from the May final. Brownlee's June final runoff forecast is 3.54 MAF, 56% of normal, no change from the May final. Lower Granite's June final forecast is 18.1 MAF, 84% of normal, down 2% from the May final.

### ***8. End of Spill at Collector Dams.***

Turner reminded the group that, at the last TMT meeting, 6 a.m. June 20 was the planning date and time discussed for the end of spill at the collector dams. Wagner said

passage indices indicate that we're still on track for the June 20 end of spill at the collector dams; at McNary, some voluntary spill is expected to continue. We aren't ready to begin transportation at this point, however, because spring like conditions continue in the system, Wagner said. The weather is expected to be cool, at least for the next several days, so I would recommend that we discuss transportation at Tuesday's FPAC meeting, then contact the Corps, Wagner said.

Turner said flows are expected to decline to below 220 Kcfs at McNary by about June 23. Also, he said, when you say spring like conditions, are you saying that temperatures need to be above 62 degrees and flows need to be below 220 Kcfs, or one or the other? That's what we'll be discussing at Tuesday's FPAC meeting, Wagner replied. We'll wait to hear from you on Tuesday, said Turner.

With respect to spill at McNary, said Turner, it looks as though there will continue to be substantial involuntary spill at that project for some time; however, would it be acceptable to stop voluntary spill to the gas cap at that project on June 20? Yes, was the reply. Boyce recommended that the action agencies shape the involuntary spill into the nighttime hours. We'll do so whenever possible, Bettin replied. And we'll let project personnel know transport at McNary could begin as soon as next week, Turner said.

#### ***9. New System Operational Requests.***

See Agenda Item 3, above, for discussion of SOR # 2003-10, Libby operations for sturgeon and bull trout.

#### ***10. Recommended Operations.***

Recommended operations were summarized in a previous agenda item.

#### ***11. Other.***

Turner said the main fish bypass pipe at Lower Granite has been experiencing some problems; the valve controlling the water supply through that pipe is currently stuck in the fully open position, so we cannot regulate flow through that pipe, possibly because of a debris problem. The valve stem is also stripped, he said. The plant is 25 years old, so it could just be age and wear, he said. We do want to get that fixed, however, but we're waiting to get the necessary part – it may be necessary to fabricate something, because it is a French part if we need to order it. This may take awhile, in other words, Turner said.

The upshot is that we will likely need to dewater the fishway in order to fix the debris problem, said Turner; under the Fish Passage Plan, the project can operate that way for up to five hours. We hope it will be possible to fix the problem in that time, but it may not be possible to do so, Turner said. We were planning to do that yesterday, he said, but canceled the operation – we will likely reschedule it some time in the next two weeks. Turner spent a few minutes describing the operational nuances of the repair, noting that there is a line outage scheduled for mid-July at Lower Granite. If the part is available, it may be possible to fix the bypass pipe valve at the same time.

At Ice Harbor, said Turner, the Corps is coordinating summer spill operations and tests, given the high juvenile injury rates documented during spill tests at that project in 2003. The feeling was that this may be related to the spill pattern. We conducted a four-hour test, discharging 15 Kcfs through spill bays 2, 3 and 4 yesterday (45 kcfs total spill discharge), Turner said; biologists from NOAA Fisheries and the Corps were on hand to observe the test. We saw gas levels of about 120.3% at the fixed monitoring site downstream, Turner said; we would likely need to cut back a stop or more in order to avoid TDG exceedences if we decide to implement this spill pattern this summer. Turner agreed to provide an update at the July 2 TMT meeting.

***12. Next TMT Meeting Date.***

The next regularly scheduled meeting of the Technical Management Team was set for Wednesday, July 2.

Meeting summary prepared by Jeff Kuechle, BPA contractor.

***List of Attendees***

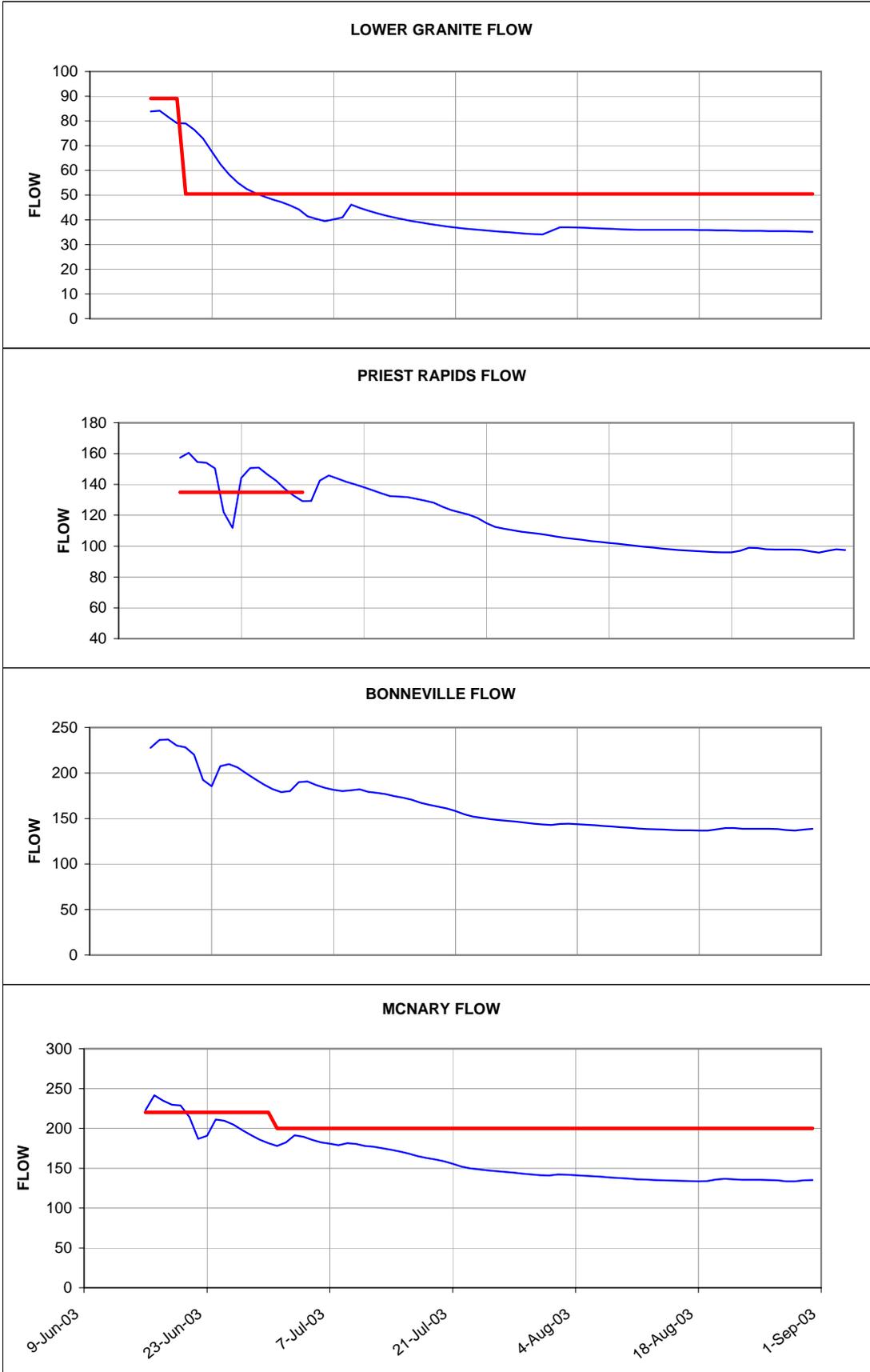
Rudd Turner	COE
Dave Wills	USFWS
Steve Pettit	IDFG
Tony Norris	BOR
Pat McGrane	BOR
Ron Boyce	ODFW
Shane Scott	WDFW
Jim Litchfield	State of Montana
Chris Ross	NOAA Fisheries
Paul Wagner	NOAA Fisheries
Scott Bettin	BPA
Steve Kerns	BPA
Donna Silverberg	Facilitation Team
Robin Harkless	Facilitation Team
Kyle Martin	CRITFC
Julie Ammann	COE
Mary Karen Scullion	COE
Laura Hamilton	COE
Jeff Laufle	COE
Nick Lane	BPA
Nancy Yun	COE
Tina Lundell	COE
Mike Butchko	PowerEx
Mike Hill	EWEB
Kevin Nordt	PGE
Tom Haymaker	PNGC
Tim Heizenrater	PPM

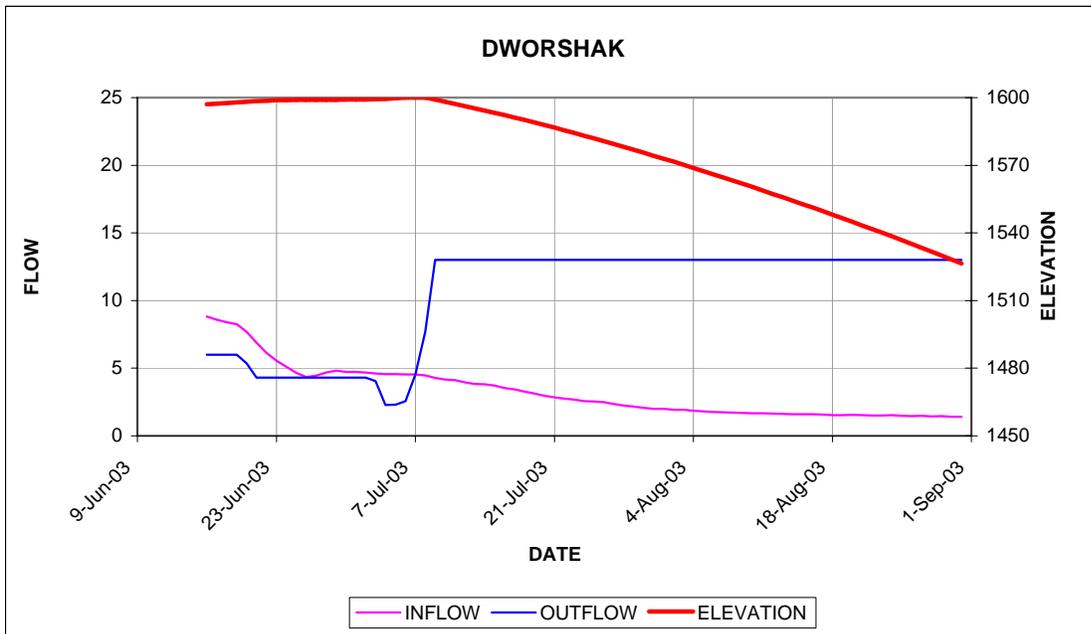
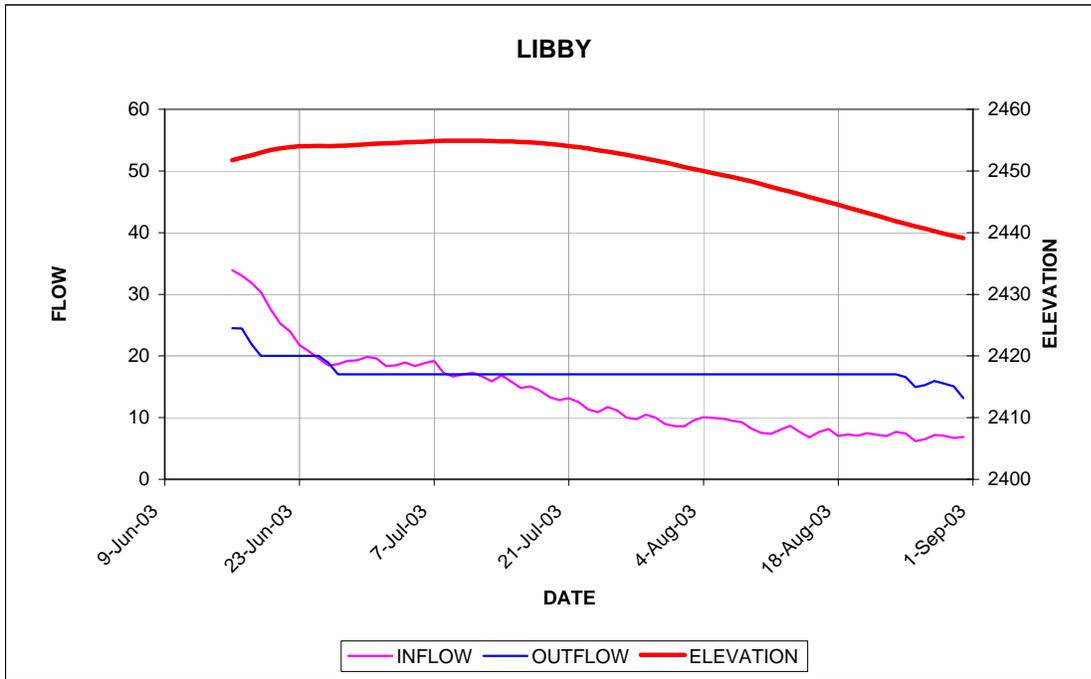
Mike O'Bryant	CBB
Russ George	WMCI
Lance Elias	PPL
Dennis Rohr	D. Rohr & Assoc.
Glenn Traeger	Avista
Steven Wallace	PacifiCorp



06-Jun-03  
**WY 2003**  
**SUMMER**

	Outflow (NPT-ID) (kcfs)	Outflow (NPT-Alt#1) (kcfs)	Outflow (NMFS-Alt#1) (kcfs)	Outflow (NMFS-Alt#2) (kcfs)	Outflow (BiOp) (kcfs)	scen #6	HCD Out (kcfs)
Jun 29th	DWORSHAK						HELLS CANYON
Jun 30-July 6	2.9	2.9	12.0	5.0	14.0	8	13
Jul 7-13	2.1	2.1	12.0	14.0	14.0	10	17
Jul 14-20	5.0	10.0	12.0	14.0	14.0	10	15.75
Jul 21-27	10.0	10.0	12.0	14.0	14.0	11	11
Jul 28- Aug 3	12.0	10.0	12.0	14.0	14.0	11	12
Aug 4-10	14.0	10.0	12.0	14.0	14.0	11	15
Aug 11-17	14.0	10.0	12.0	12.0	14.0	10	15
Aug 18-24	14.0	10.0	12.0	9.0	2.1	9	14
Aug 25-31	14.0	10.0	5.5	5.5	1.4	8	13
Sep 1-7	10.0	10.0	1.4	1.4	1.4	7	13
Sep 8-14	6.3	10.0	1.4	1.4	1.4	6	11.5
Sep 15-21	1.4	10.0	1.4	1.4	1.4	3	9
Sep 22-28	1.4	2.1	1.4	1.4	1.4	3	9
Sep 30th							
Total (KaF):	1,487 107.1	1,487 107.1	1,487 107.1	1,487 107.1	1,487 107.1	107.0	2,336





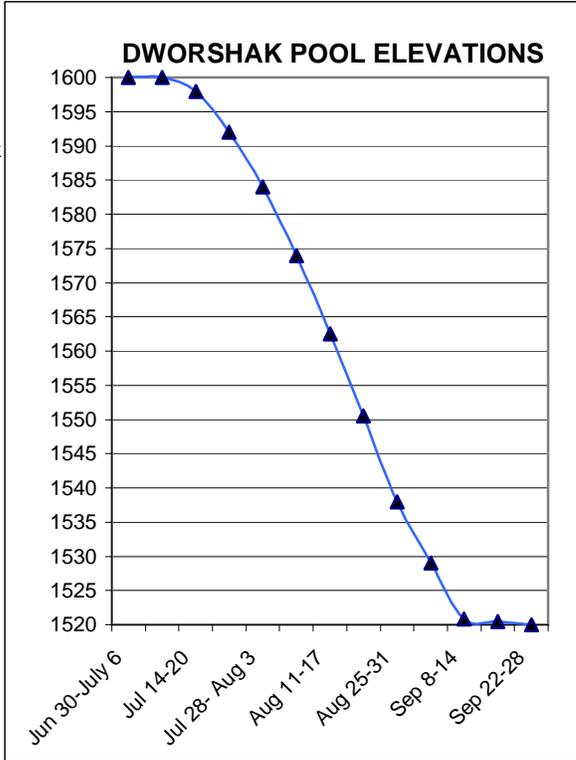
## Meeting 2003 BiOp Flow Objectives

	Actual*	Spring Target	Dates	Forecast	Summer Target	Dates
	(kcf)	(kcf)		(kcf)	(kcf)	
Lower Granite	90.2	89.1	03 Apr - 20 Jun	40.6	50.5	21 Jun - 31 Aug
McNary	232.2	220.0	10 Apr - 30 Jun	151.1	200.0	01 Jul - 31 Aug
Priest Rapids	141.5	135.0	10 Apr - 30 Jun			

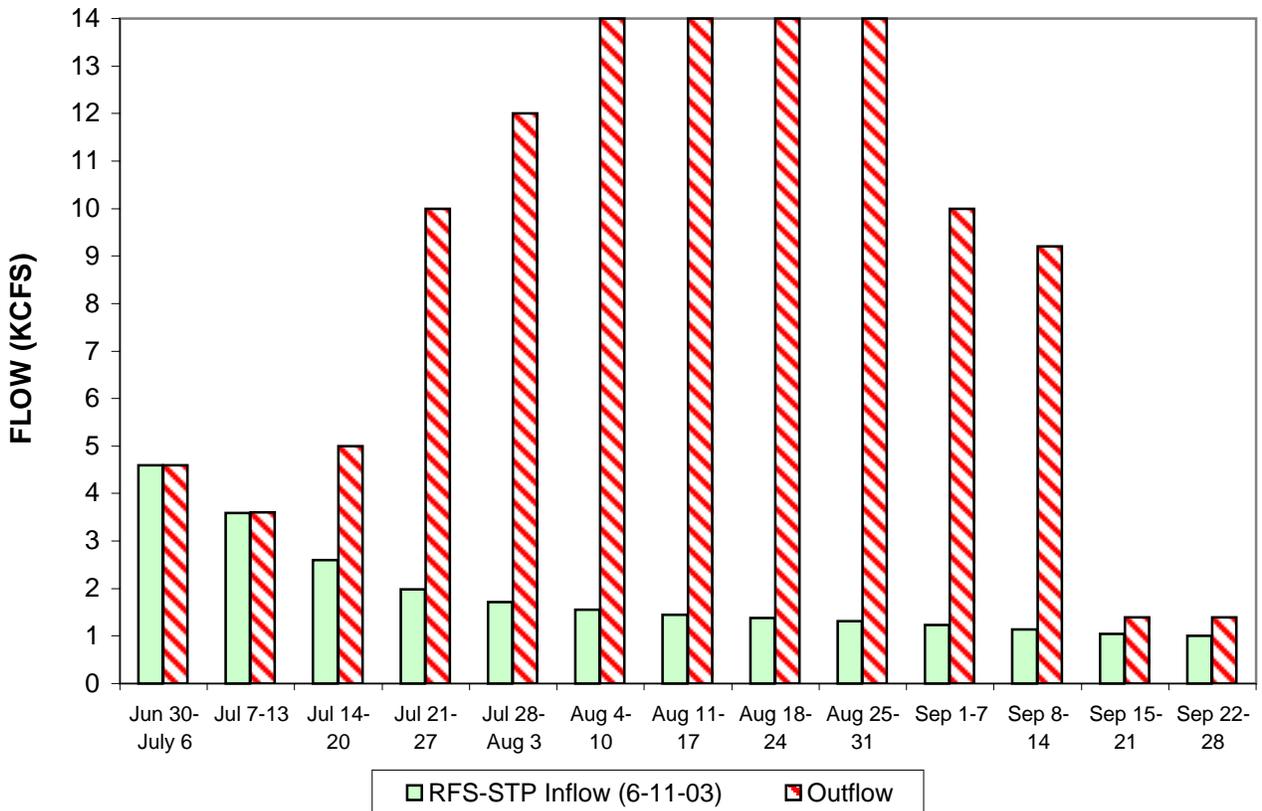
\* Observed data through 16 June and STP forecast data from 6/17 run

**N.F. Clearwater at Dworshak (DWR)**

17-Jun-03	Outflow (NPT-ID) (kcfs)	RFS-STP Inflow (6-11-03) (NWRFC) (kcfs)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week
Jun 29th		Forecast:		1600.0
Jun 30-July 6	4.6	4.6	0	1600.0
Jul 7-13	3.6	3.6	0	1600.0
Jul 14-20	5.0	2.6	-33	1598.0
Jul 21-27	10.0	2.0	-111	1592.0
Jul 28- Aug 3	12.0	1.7	-143	1584.0
Aug 4-10	14.0	1.5	-173	1574.0
Aug 11-17	14.0	1.5	-174	1562.5
Aug 18-24	14.0	1.4	-175	1550.5
Aug 25-31	14.0	1.3	-176	1538.0
Sep 1-7	10.0	1.2	-122	1529.0
Sep 8-14	9.2	1.1	-112	1520.8
Sep 15-21	1.4	1.0	-5	1520.5
Sep 22-28	1.4	1.0	-6	1520.0
Sep 30th				
Total (KaF):	1,572	341	-1230	

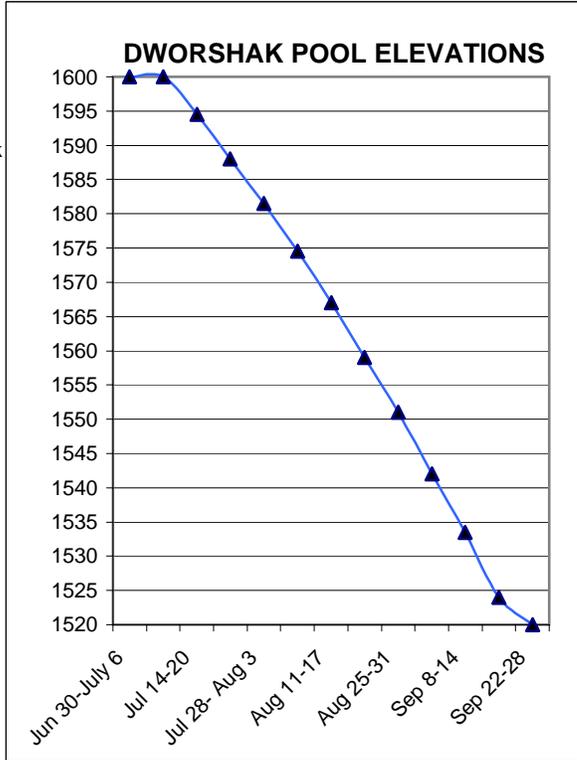


**DWORSHAK SEASONAL FLOWS: NPT-ID PLAN**

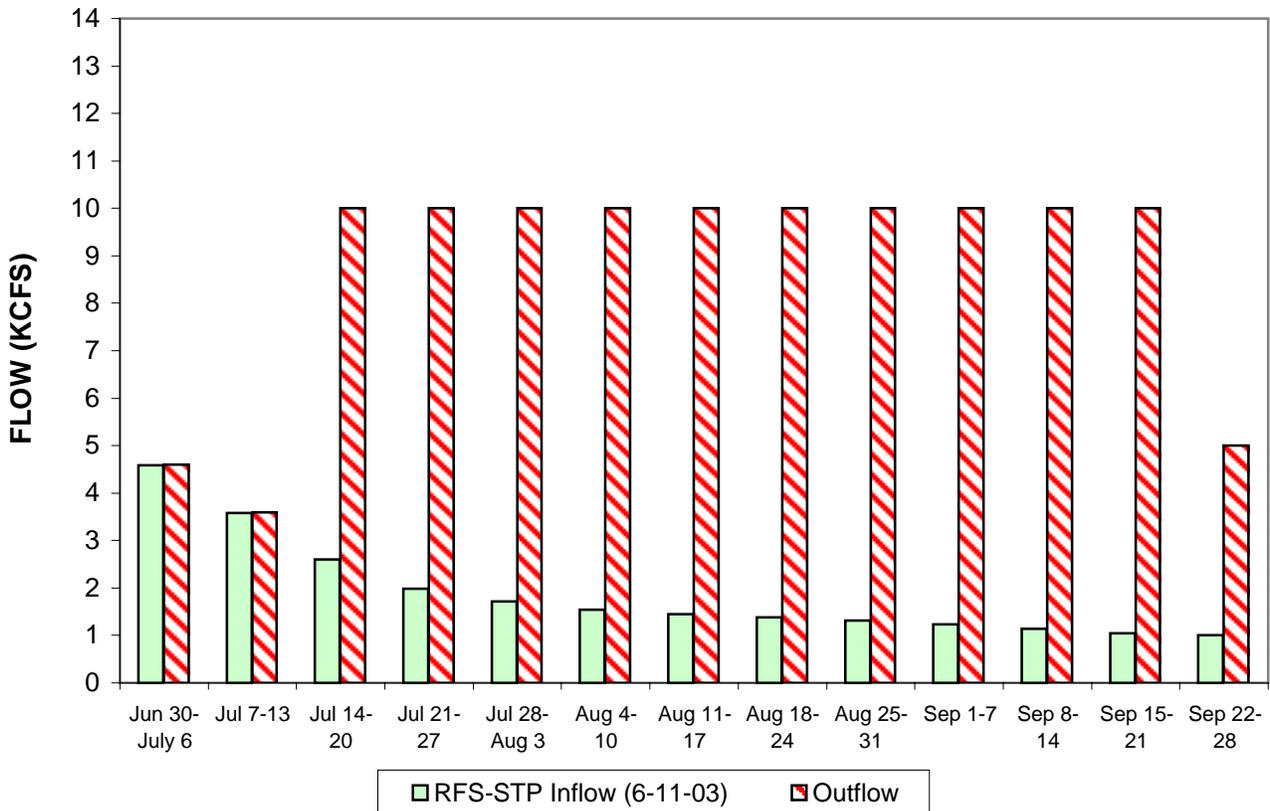


**N.F. Clearwater at Dworshak (DWR)**

17-Jun-03	Outflow (NPT-Alt1) (kcfs)	RFS-STP Inflow (6-11-03) (NWRFC) (kcfs)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week
Jun 29th		Forecast:		1600.0
Jun 30-July 6	4.6	4.6	0	1600.0
Jul 7-13	3.6	3.6	0	1600.0
Jul 14-20	10.0	2.6	-103	1594.5
Jul 21-27	10.0	2.0	-111	1588.0
Jul 28- Aug 3	10.0	1.7	-115	1581.5
Aug 4-10	10.0	1.5	-117	1574.5
Aug 11-17	10.0	1.5	-119	1567.0
Aug 18-24	10.0	1.4	-120	1559.0
Aug 25-31	10.0	1.3	-121	1551.0
Sep 1-7	10.0	1.2	-122	1542.0
Sep 8-14	10.0	1.1	-123	1533.5
Sep 15-21	10.0	1.0	-124	1524.0
Sep 22-28	5.0	1.0	-56	1520.0
Sep 30th				
Total (KaF):	1,572	341	-1230	

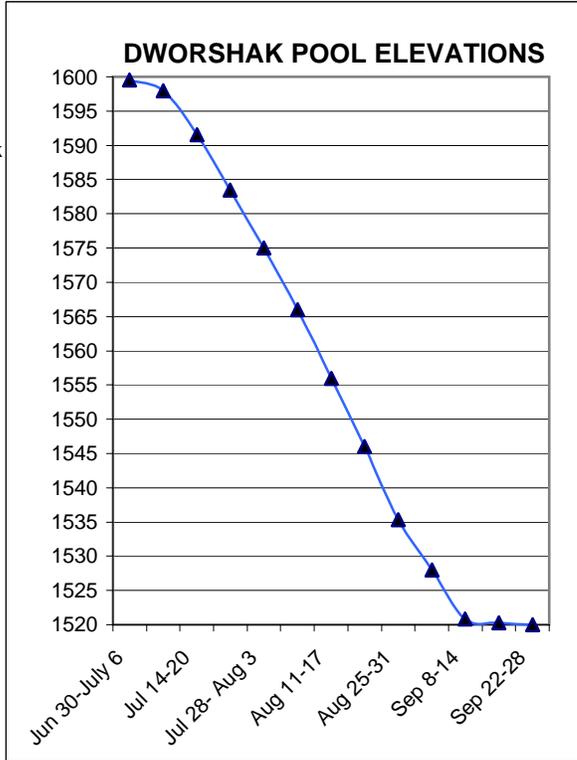


**DWORSHAK SEASONAL FLOWS: NPT ALTERNATIVE PLAN #1**

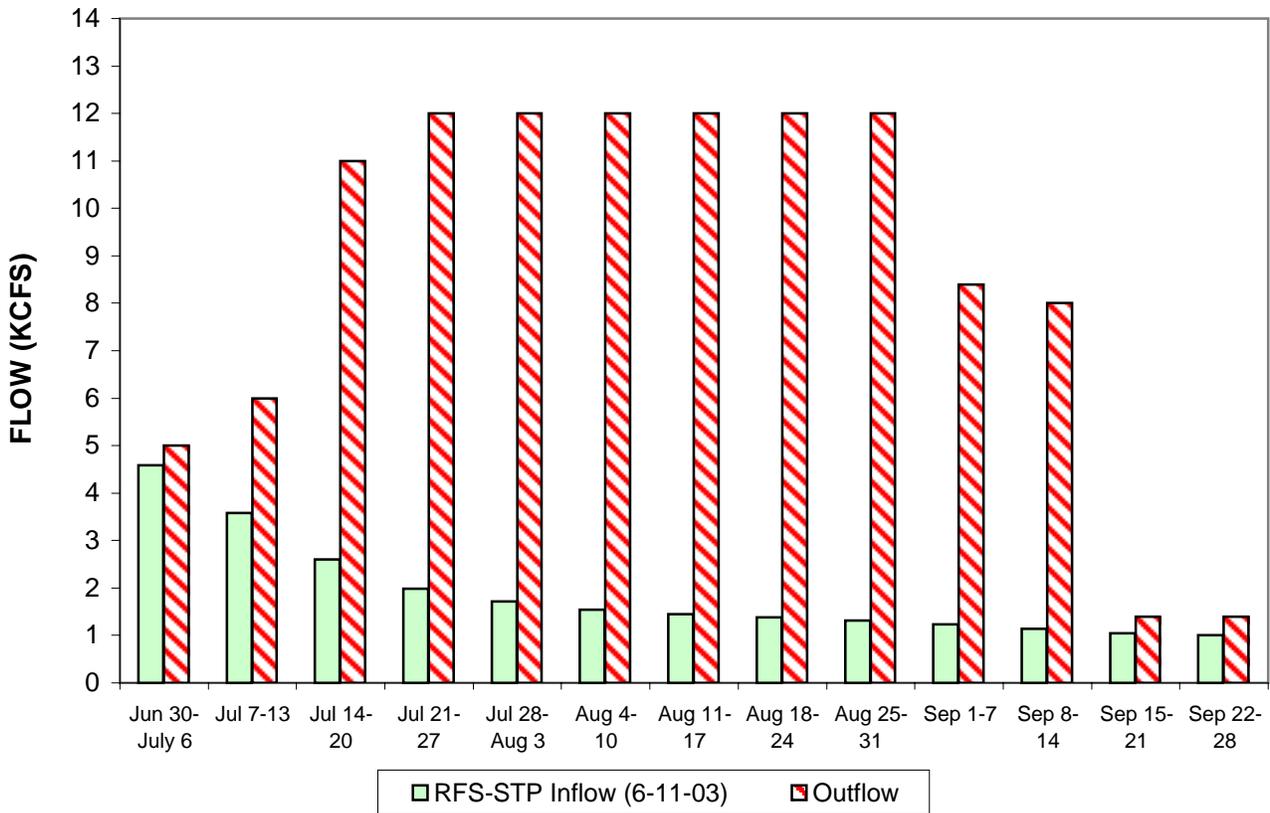


**N.F. Clearwater at Dworshak (DWR)**

17-Jun-03	Outflow (NPT-Alt2) (kcfs)	RFS-STP Inflow (6-11-03) (NWRFC) (kcfs)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week
Jun 29th		Forecast:		1600.0
Jun 30-July 6	5.0	4.6	-6	1599.5
Jul 7-13	6.0	3.6	-34	1598.0
Jul 14-20	11.0	2.6	-117	1591.5
Jul 21-27	12.0	2.0	-139	1583.5
Jul 28- Aug 3	12.0	1.7	-143	1575.0
Aug 4-10	12.0	1.5	-145	1566.0
Aug 11-17	12.0	1.5	-146	1556.0
Aug 18-24	12.0	1.4	-147	1546.0
Aug 25-31	12.0	1.3	-148	1535.3
Sep 1-7	8.4	1.2	-100	1528.0
Sep 8-14	8.0	1.1	-95	1520.8
Sep 15-21	1.4	1.0	-5	1520.3
Sep 22-28	1.4	1.0	-6	1520.0
Sep 30th				
Total (KaF):	1,572	341	-1230	

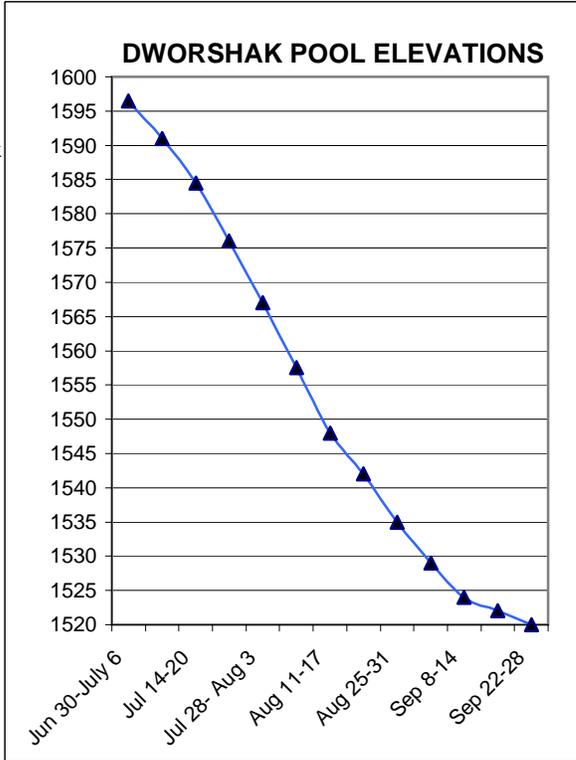


**DWORSHAK SEASONAL FLOWS: NPT ALTERNATIVE PLAN #2**

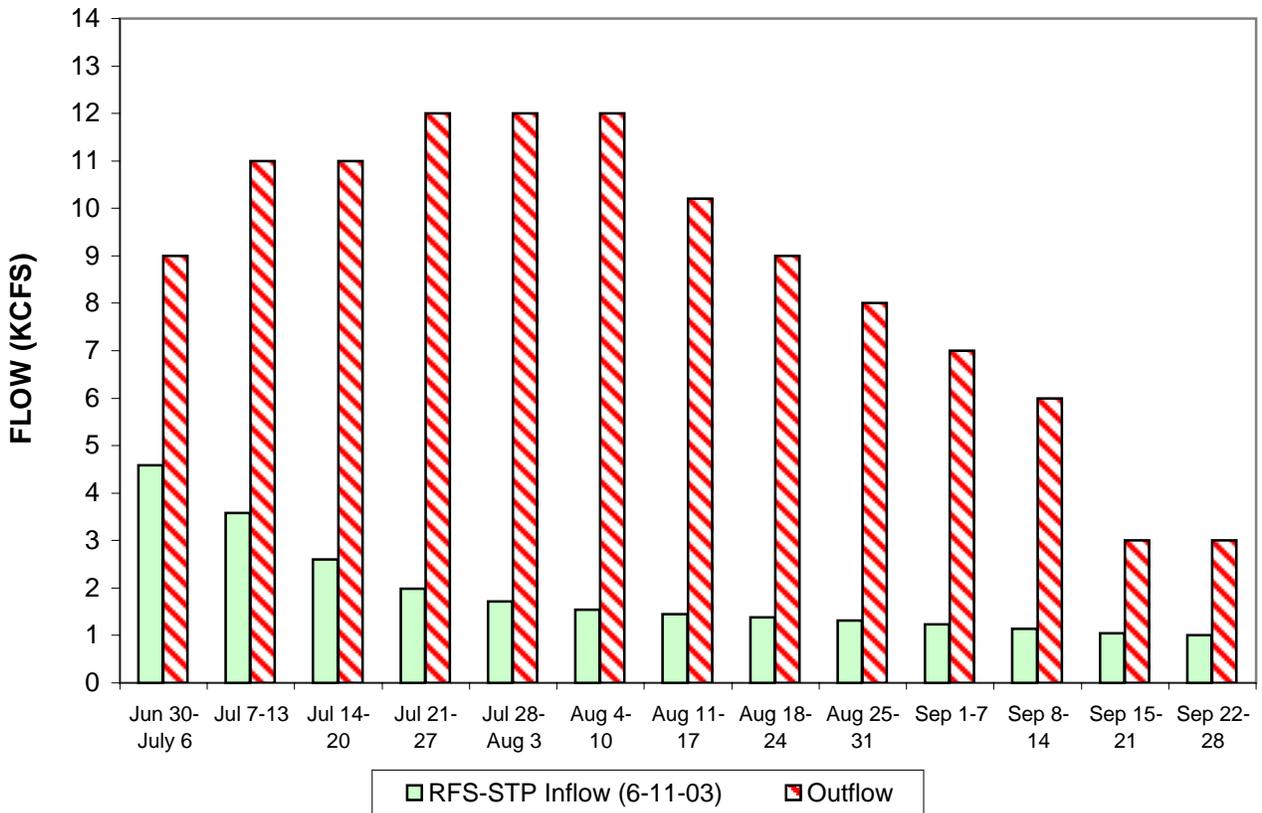


**N.F. Clearwater at Dworshak (DWR)**

17-Jun-03	Outflow (EPA)	RFS-STP Inflow (6-11-03) (NWRFC)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week
Jun 29th		Forecast:		1600.0
Jun 30-July 6	9.0	4.6	-61	1596.5
Jul 7-13	11.0	3.6	-103	1591.0
Jul 14-20	11.0	2.6	-117	1584.5
Jul 21-27	12.0	2.0	-139	1576.0
Jul 28- Aug 3	12.0	1.7	-143	1567.0
Aug 4-10	12.0	1.5	-145	1557.5
Aug 11-17	10.2	1.5	-121	1548.0
Aug 18-24	9.0	1.4	-106	1542.0
Aug 25-31	8.0	1.3	-93	1535.0
Sep 1-7	7.0	1.2	-80	1529.0
Sep 8-14	6.0	1.1	-68	1524.0
Sep 15-21	3.0	1.0	-27	1522.0
Sep 22-28	3.0	1.0	-28	1520.0
Sep 30th				
Total (KaF):	1,572	341	-1230	

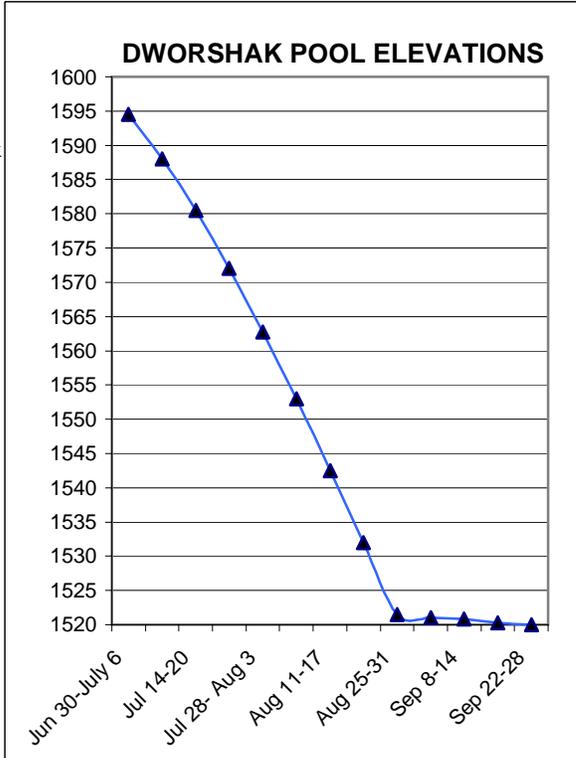


**DWORSHAK SEASONAL FLOWS: EPA PLAN**

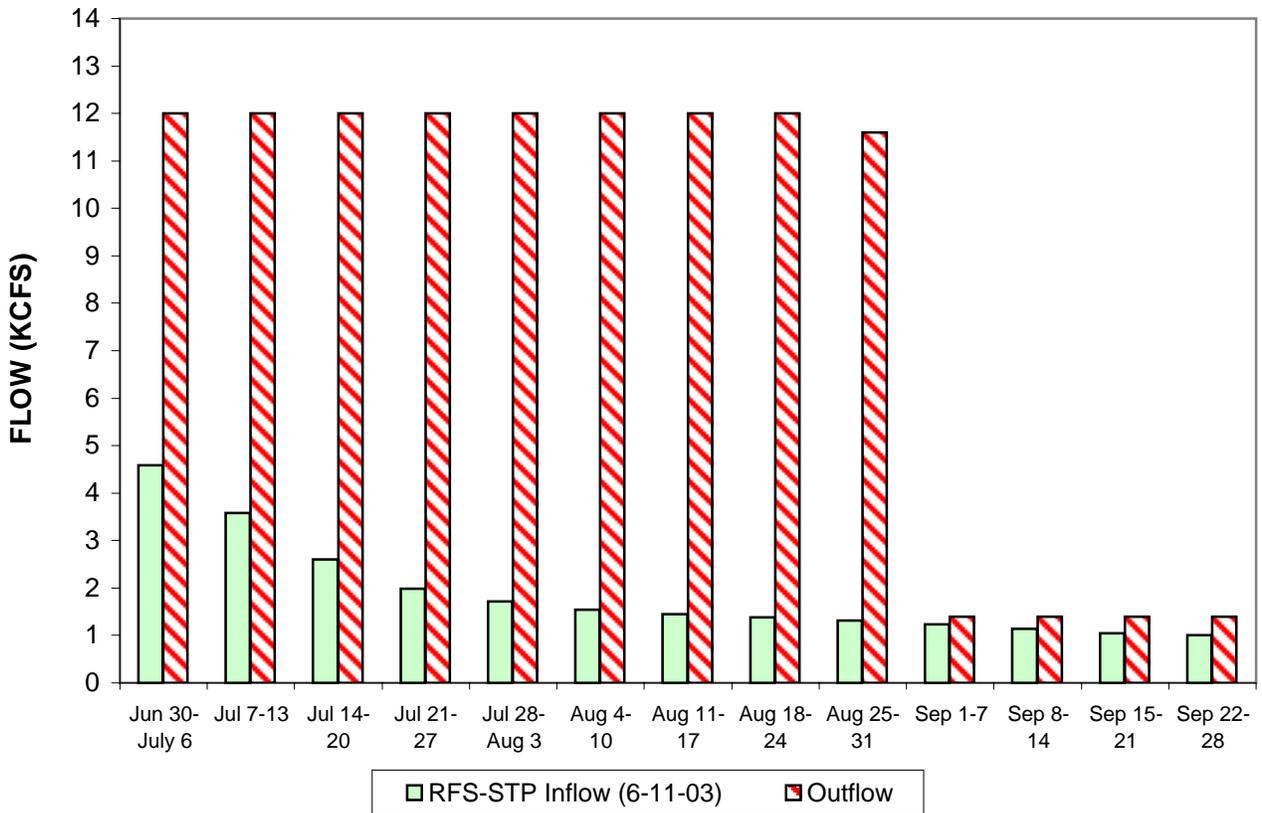


**N.F. Clearwater at Dworshak (DWR)**

17-Jun-03	Outflow (NMFS) (kcfs)	RFS-STP Inflow (6-11-03) (NWRFC) (kcfs)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week
Jun 29th		Forecast:		1600.0
Jun 30-July 6	12.0	4.6	-103	1594.5
Jul 7-13	12.0	3.6	-117	1588.0
Jul 14-20	12.0	2.6	-130	1580.5
Jul 21-27	12.0	2.0	-139	1572.0
Jul 28- Aug 3	12.0	1.7	-143	1562.7
Aug 4-10	12.0	1.5	-145	1553.0
Aug 11-17	12.0	1.5	-146	1542.5
Aug 18-24	12.0	1.4	-147	1532.0
Aug 25-31	11.6	1.3	-143	1521.5
Sep 1-7	1.4	1.2	-2	1521.0
Sep 8-14	1.4	1.1	-4	1520.8
Sep 15-21	1.4	1.0	-5	1520.3
Sep 22-28	1.4	1.0	-6	1520.0
Sep 30th				
Total (KaF):	1,572	341	-1230	

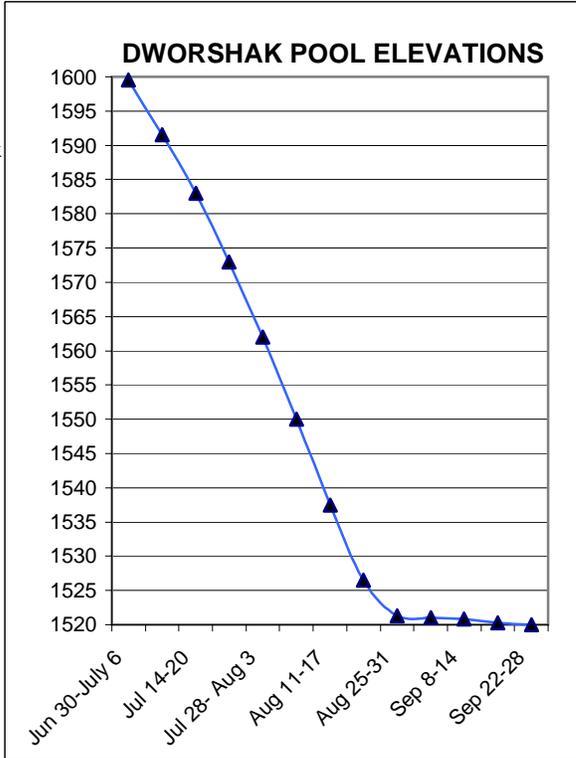


**DWORSHAK SEASONAL FLOWS: NMFS ALTERNATIVE #1**

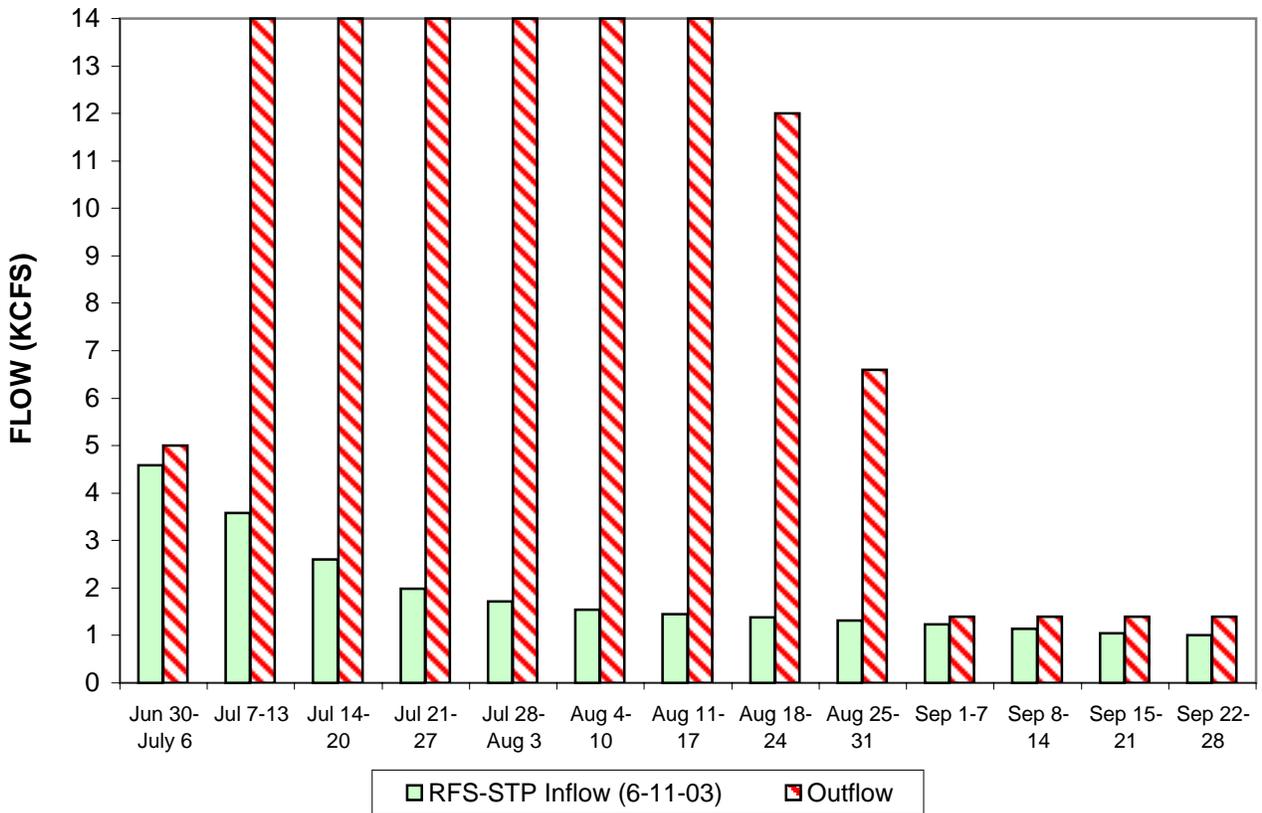


**N.F. Clearwater at Dworshak (DWR)**

17-Jun-03	Outflow (NMFS) (kcfs)	RFS-STP Inflow (6-11-03) (NWRFC) (kcfs)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week
Jun 29th		Forecast:		1600.0
Jun 30-July 6	5.0	4.6	-6	1599.5
Jul 7-13	14.0	3.6	-145	1591.5
Jul 14-20	14.0	2.6	-158	1583.0
Jul 21-27	14.0	2.0	-167	1573.0
Jul 28- Aug 3	14.0	1.7	-171	1562.0
Aug 4-10	14.0	1.5	-173	1550.0
Aug 11-17	14.0	1.5	-174	1537.5
Aug 18-24	12.0	1.4	-147	1526.5
Aug 25-31	6.6	1.3	-73	1521.3
Sep 1-7	1.4	1.2	-2	1521.0
Sep 8-14	1.4	1.1	-4	1520.8
Sep 15-21	1.4	1.0	-5	1520.3
Sep 22-28	1.4	1.0	-6	1520.0
Sep 30th				
Total (KaF):	1,572	341	-1230	

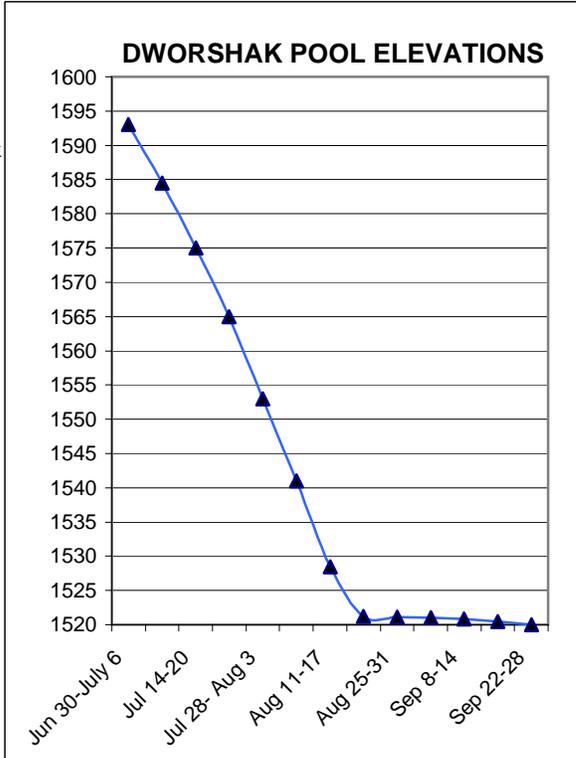


**DWORSHAK SEASONAL FLOWS: NMFS ALTERNATIVE #2**



**N.F. Clearwater at Dworshak (DWR)**

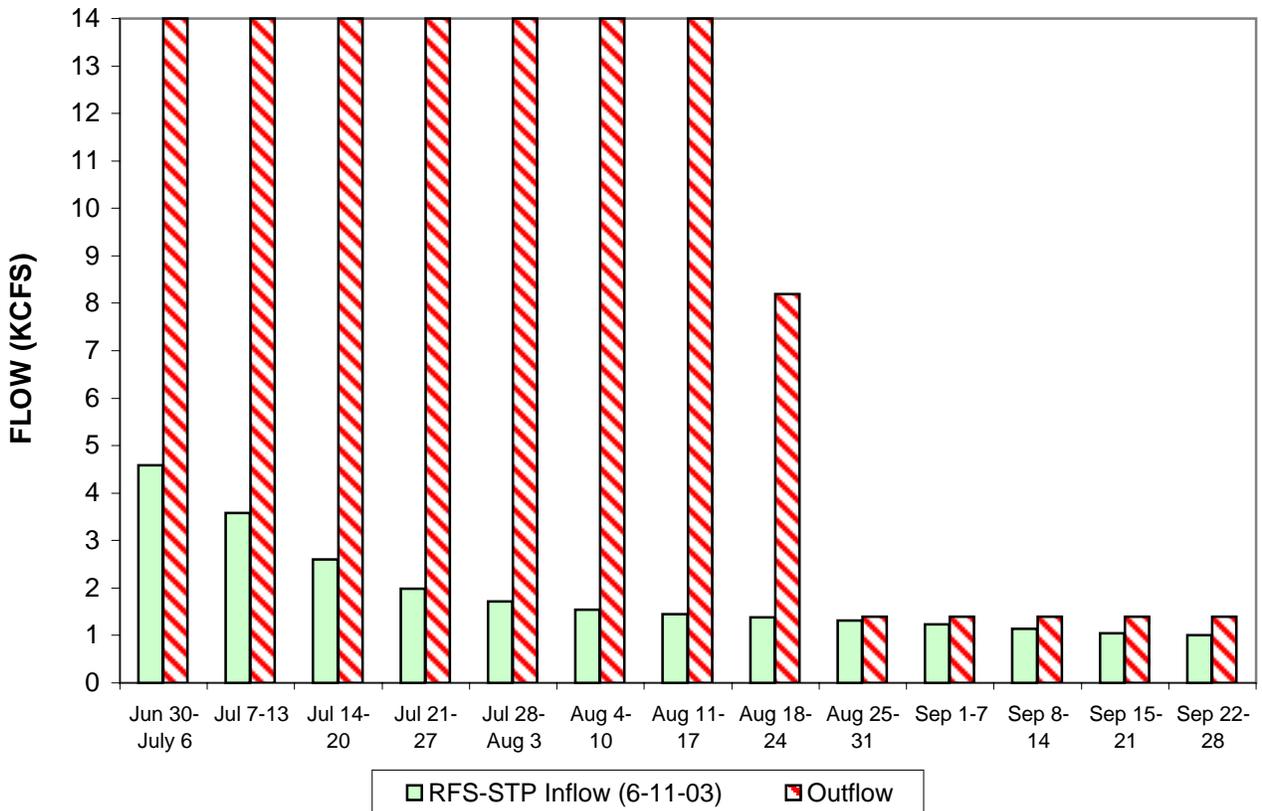
17-Jun-03	Outflow (BiOp) (kcfs)	RFS-STP Inflow (6-11-03) (NWRFC) (kcfs)	Storage Change (KaF)	DWR Pool Elevation (feet) end-of-week
Jun 29th		Forecast:		1600.0
Jun 30-July 6	14.0	4.6	-131	1593.0
Jul 7-13	14.0	3.6	-145	1584.5
Jul 14-20	14.0	2.6	-158	1575.0
Jul 21-27	14.0	2.0	-167	1565.0
Jul 28- Aug 3	14.0	1.7	-171	1553.0
Aug 4-10	14.0	1.5	-173	1541.0
Aug 11-17	14.0	1.5	-174	1528.5
Aug 18-24	8.2	1.4	-95	1521.2
Aug 25-31	1.4	1.3	-1	1521.1
Sep 1-7	1.4	1.2	-2	1521.0
Sep 8-14	1.4	1.1	-4	1520.8
Sep 15-21	1.4	1.0	-5	1520.5
Sep 22-28	1.4	1.0	-6	1520.0
Sep 30th				
Total (KaF):	1,572	341	-1230	



CRITFC Hydro Program

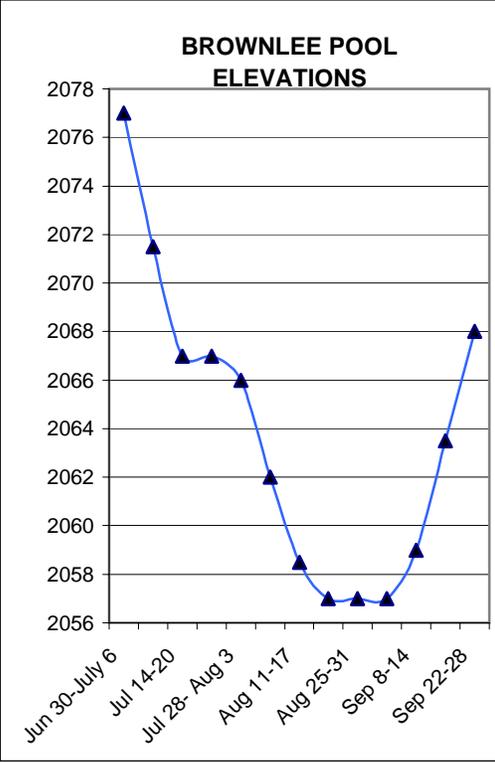
BiOp Plan

**DWORSHAK SEASONAL FLOWS: NMFS BIOLOGICAL OPINION**



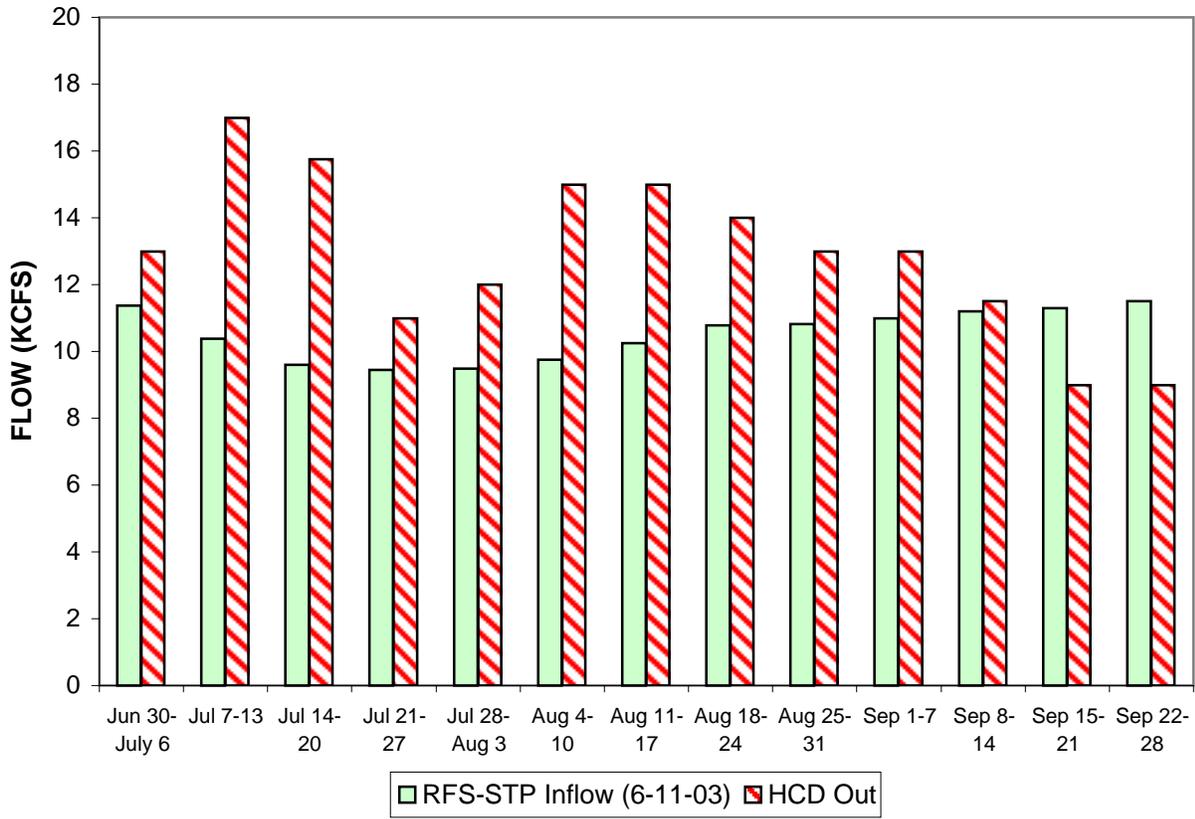
**Snake River at Brownlee (BRN)**

17-Jun-03	HCD Out	RFS-STP Inflow (6-11-03)	Local Flow	Storage Change	BRN Pool Elevation
	(kcfs)	(NWRFC) (kcfs)	(kcfs)	(KaF)	(feet)
Jun 29th		Forecast:			2077.0
Jun 30-July 6	13	11.4	1.5	-2	2077.0
Jul 7-13	17	10.4	1.5	-71	2071.5
Jul 14-20	15.75	9.6	1.5	-65	<b>2067.0</b>
Jul 21-27	11	9.4	1.5	-1	2067.0
Jul 28- Aug 3	12	9.5	1.5	-14	2066.0
Aug 4-10	15	9.8	1.8	-48	2062.0
Aug 11-17	15	10.3	1.8	-41	2058.5
Aug 18-24	14	10.8	1.9	-18	2057.0
Aug 25-31	13	10.8	2.2	0	2057.0
Sep 1-7	13	11.0	2.1	1	2057.0
Sep 8-14	11.5	11.2	1.9	22	<b>2059.0</b>
Sep 15-21	9	11.3	1.8	57	2063.5
Sep 22-28	9	11.5	1.7	58	2068.0
Sep 30th					
Total (KaF):	2,336	1,901		-120	



CRITFC Hydro Program **Biological Opinion** BiOp = 2059 ft

**BROWNLEE and HELLS CANYON SEASONAL FLOWS**



**Snake at Lower Granite (LWG)**

17-Jun-03

**WY 2003  
SUMMER**

NPT-ID Outflow (kcfs)	NPT#1 Outflow	NPT#2 Outflow	EPA Outflow	NMFS#1 Outflow	NMFS#2 Outflow	BiOp Outflow
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Grand Ronde R. & Local (kcfs)	Clearwater: DWR (NPT-ID) (kcfs)	Salmon: Orofino (kcfs)	Snake White Bird (kcfs)	Snake at Hells Canyon (kcfs)
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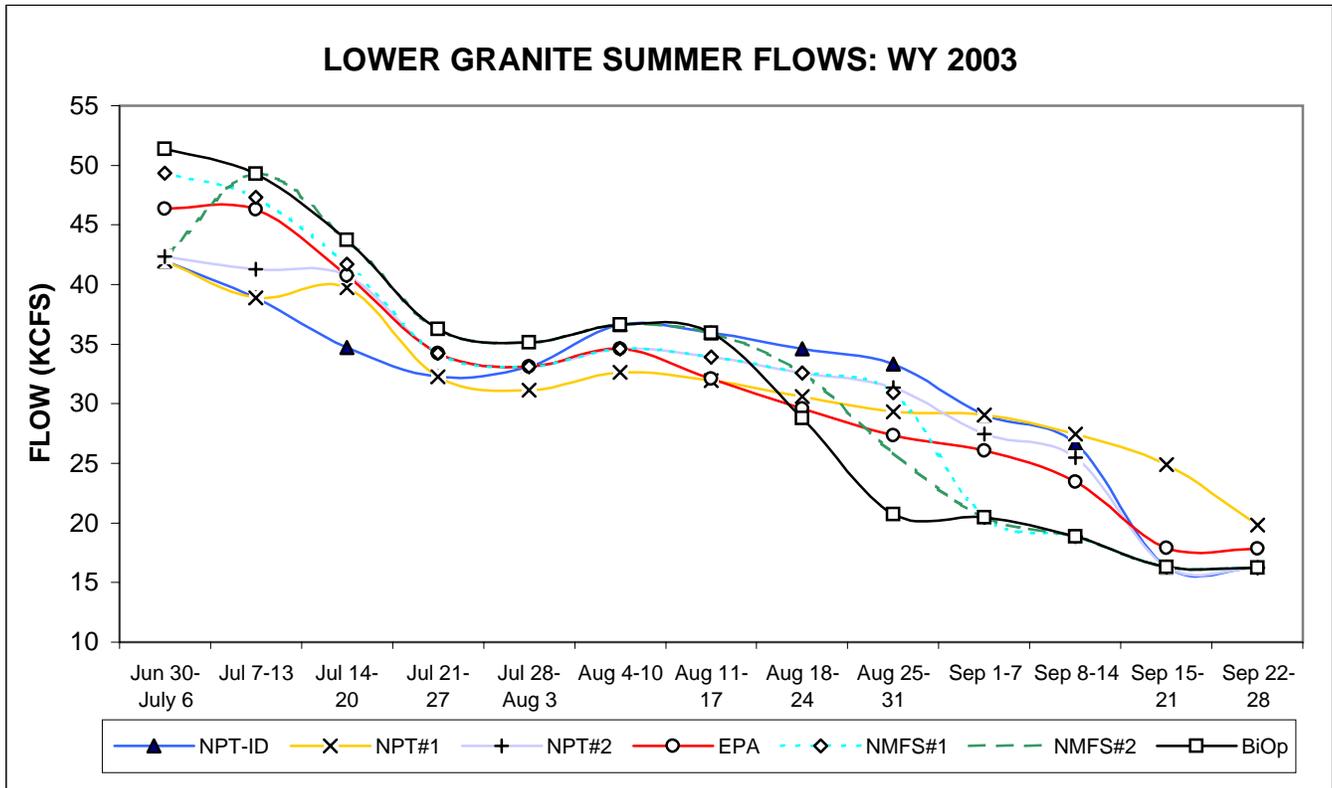
	NPT-ID	NPT#1	NPT#2	EPA	NMFS#1	NMFS#2	BiOp	Forecast:	Forecast:	Forecast:		
Jun 29th												
Jun 30-July 6	42.0	42.0	42.4	46.4	49.4	42.4	51.4	2.1	4.6	11.7	10.6	13
Jul 7-13	38.9	38.9	41.3	46.3	47.3	49.3	49.3	1.9	3.6	8.1	8.4	17
Jul 14-20	34.7	39.7	40.7	40.7	41.7	43.7	43.7	1.7	5	5.4	6.8	16
Jul 21-27	32.2	32.2	34.2	34.2	34.2	36.2	36.2	1.6	10	3.8	5.8	11
Jul 28- Aug 3	33.1	31.1	33.1	33.1	33.1	35.1	35.1	1.2	12	2.8	5.1	12
Aug 4-10	36.6	32.6	34.6	34.6	34.6	36.6	36.6	0.7	14	2.3	4.7	15
Aug 11-17	35.9	31.9	33.9	32.1	33.9	35.9	35.9	0.6	14	1.9	4.4	15
Aug 18-24	34.6	30.6	32.6	29.6	32.6	32.6	28.8	0.6	14	1.7	4.3	14
Aug 25-31	33.3	29.3	31.3	27.3	30.9	25.9	20.7	0.6	14	1.6	4.2	13
Sep 1-7	29.1	29.1	27.5	26.1	20.5	20.5	20.5	0.5	10	1.5	4.1	13
Sep 8-14	26.7	27.5	25.5	23.5	18.9	18.9	18.9	0.4	9.2	1.5	4.0	12
Sep 15-21	16.3	24.9	16.3	17.9	16.3	16.3	16.3	0.4	1.4	1.5	4.0	9
Sep 22-28	16.2	19.8	16.2	17.8	16.2	16.2	16.2	0.3	1.4	1.5	4.0	9
Sep 30th												

Tributary Monthly Totals (KaF):

JUL - SEP: (in KaF)	5,687	5,687	5,687	5,687	5,687	5,687	5,687	175	1,572	629	976	2,336
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CRITFC Hydro Program

RFS-STP Inflow (6-11-03)



**2003****GENESYS HYDRO MODEL RESULTS (average of Water Years 1929 through 1978)**

DWR Outflows (cfs):	NPT-ID	NPT-Alt #1	NPT-Alt #2	EPA	NMFS Alt #1	NMFS Alt #2	BiOp
July	6650	7350	8900	10900	12000	12000	14000
August 1-15	11550	8450	12000	11050	12000	13850	13850
August 16-31	14000	10000	11950	8500	13300	11550	7700
September	6600	9450	5100	5400	1300	1300	1300
DWR Elevations (feet):	NPT-ID	NPT-Alt #1	NPT-Alt #2	EPA	NMFS Alt #1	NMFS Alt #2	BiOp
31-Jul	1588	1585.5	1580	1572.5	1568.2	1567.9	1560.2
15-Aug	1570.4	1573.6	1560.7	1554.2	1547.7	1543.5	1534.9
31-Aug	1543.5	1555.7	1537.3	1538.4	1520	1520	1520
30-Sep	1520	1520	1520	1520	1520	1520	1520
June refill misses:	NPT-ID	NPT-Alt #1	NPT-Alt #2	EPA	NMFS Alt #1	NMFS Alt #1	BiOp
(> 1599 feet)	13	13	13	13	13	13	13
(> 1595 feet)	10	10	10	10	10	10	10
DWR Generation (MW):	NPT-ID	NPT-Alt #1	NPT-Alt #2	EPA	NMFS Alt #1	NMFS Alt #2	BiOp
31-Jul	313	347	409	435	440	440	440
15-Aug	400	377	439	439	439	435	435
31-Aug	438	439	438	373	424	352	319
30-Sep	277	377	218	231	51	51	51
Seasonal Total:	1010	1131	1065	1071	923	885	868

# PROPOSED DWORSHAK SUMMER 2003 OPERATIONS

<b>2003</b>		CURRENT (June 11, 2003) NWS-STP MODEL FORECAST RESULTS						
Dworshak Outflows (cfs):		NPT-ID	NPT-Alt #1	NPT-Alt #2	EPA	NMFS Alt #1	NMFS Alt #2	BiOp
July		6600	7400	8900	10900	12000	12000	14000
August 1-15		13600	10000	12000	11400	12000	14000	14000
August 16-31		14000	10000	12000	8700	11800	9900	5950
September		5500	8750	4800	4750	1400	1400	1400
SEP DWR Augmentation (KaF):		234	425	206	203	17	17	17
Lower Granite Outflows (cfs):		NPT-ID	NPT-Alt #1	NPT-Alt #2	EPA	NMFS Alt #1	NMFS Alt #2	BiOp
July		36500	37300	38800	40800	41900	41900	43900
August 1-15		35700	32100	34100	33500	34100	36100	36100
August 16-31		34200	30200	32200	28900	32000	30100	26100
September		22100	25300	21400	21300	18000	18000	18000
Dworshak at 1570 ft:		12-Aug	14-Aug	8-Aug	1-Aug	28-Jul	29-Jul	23-Jul
EPA Water Temp. Model results								
Days above 20 degC at LWG:		NPT-ID	NPT-Alt #1	NPT-Alt #2	EPA	NMFS Alt #1	NMFS Alt #2	BiOp
July		15	12	2	2	2	0	0
August 1-15		2	11	3	3	2	0	0
August 16-31		0	0	0	0	0	0	0
September		0	0	0	0	1	2	7
Total exceedences:		17	23	5	5	5	2	7