



WY16 Trinity River Release Hydrographs Recommended by the Flow/Temperature Workgroup

4/5/16 TAMWG Meeting

By: Andreas Krause,
Workgroup Coordinator



Overview

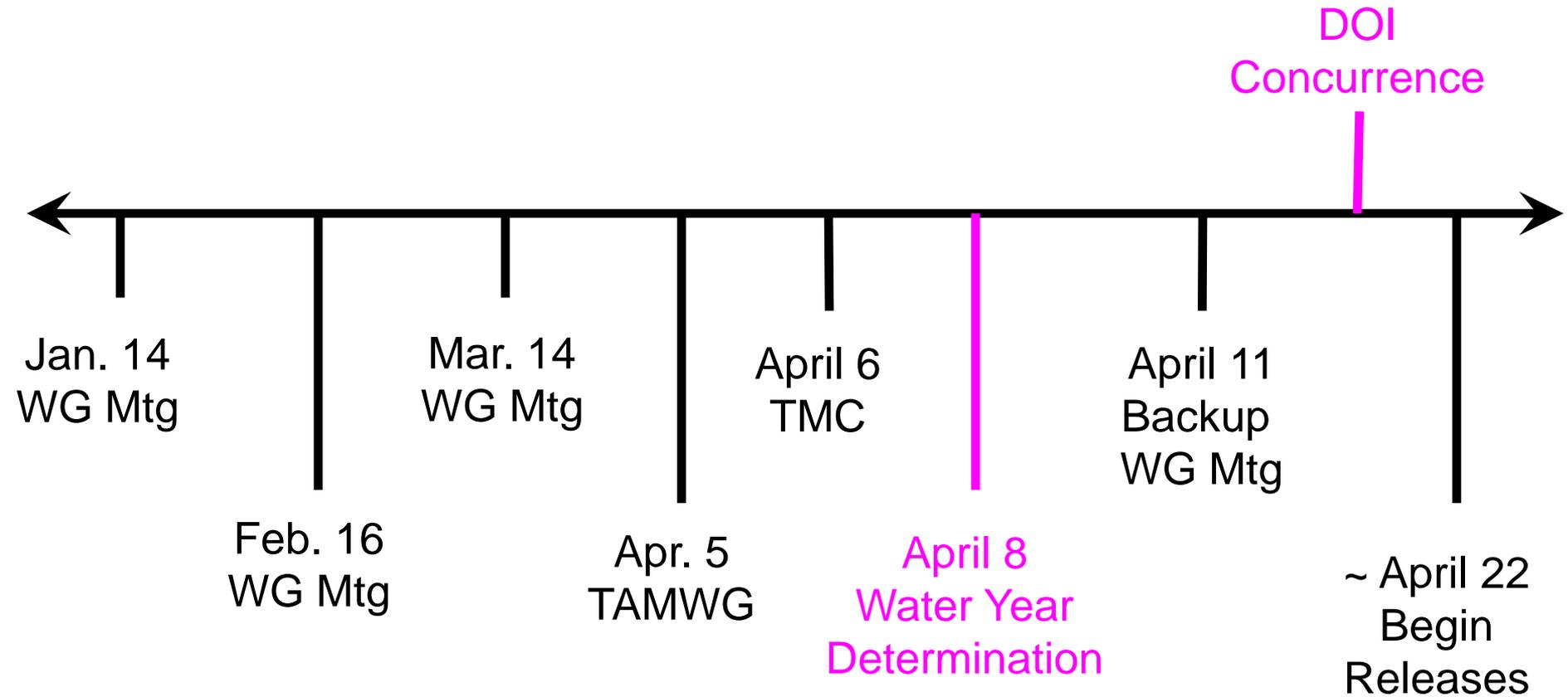
- Current Conditions
- WY16 Flow Recommendation
- WY16 Gravel Recommendation
- FY17 Science Funding Recommendation
- Looking ahead to next year



Current Conditions

Robert Stewart
to Present

Flow Scheduling Process



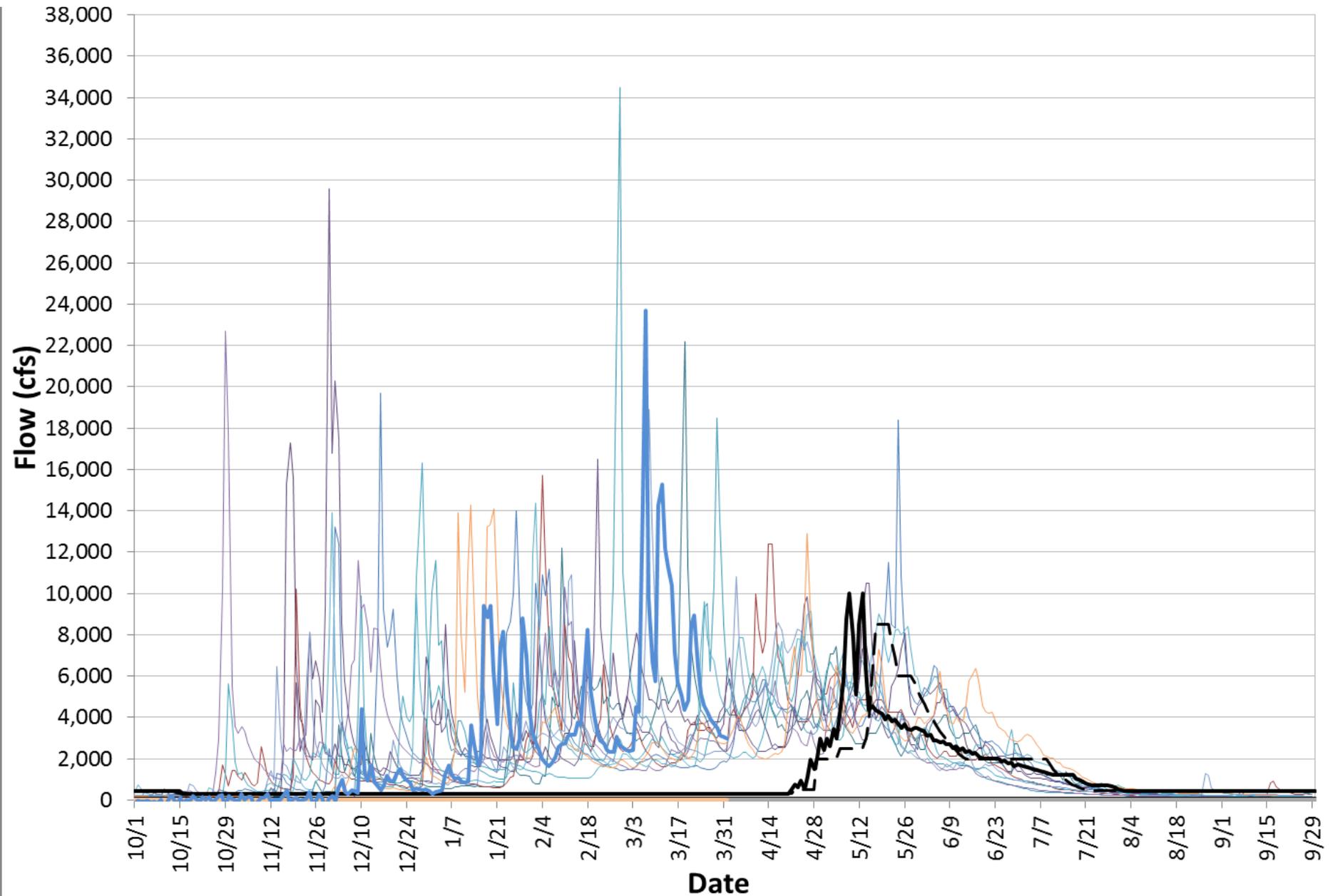
Hydrographs Considered

	Normal	Wet	Extremely Wet
Portfolio	ROD	ROD	ROD
	JPR	JPR	Riparian Initiation
		Wet 11k	
New	BPR	BPR	BPR

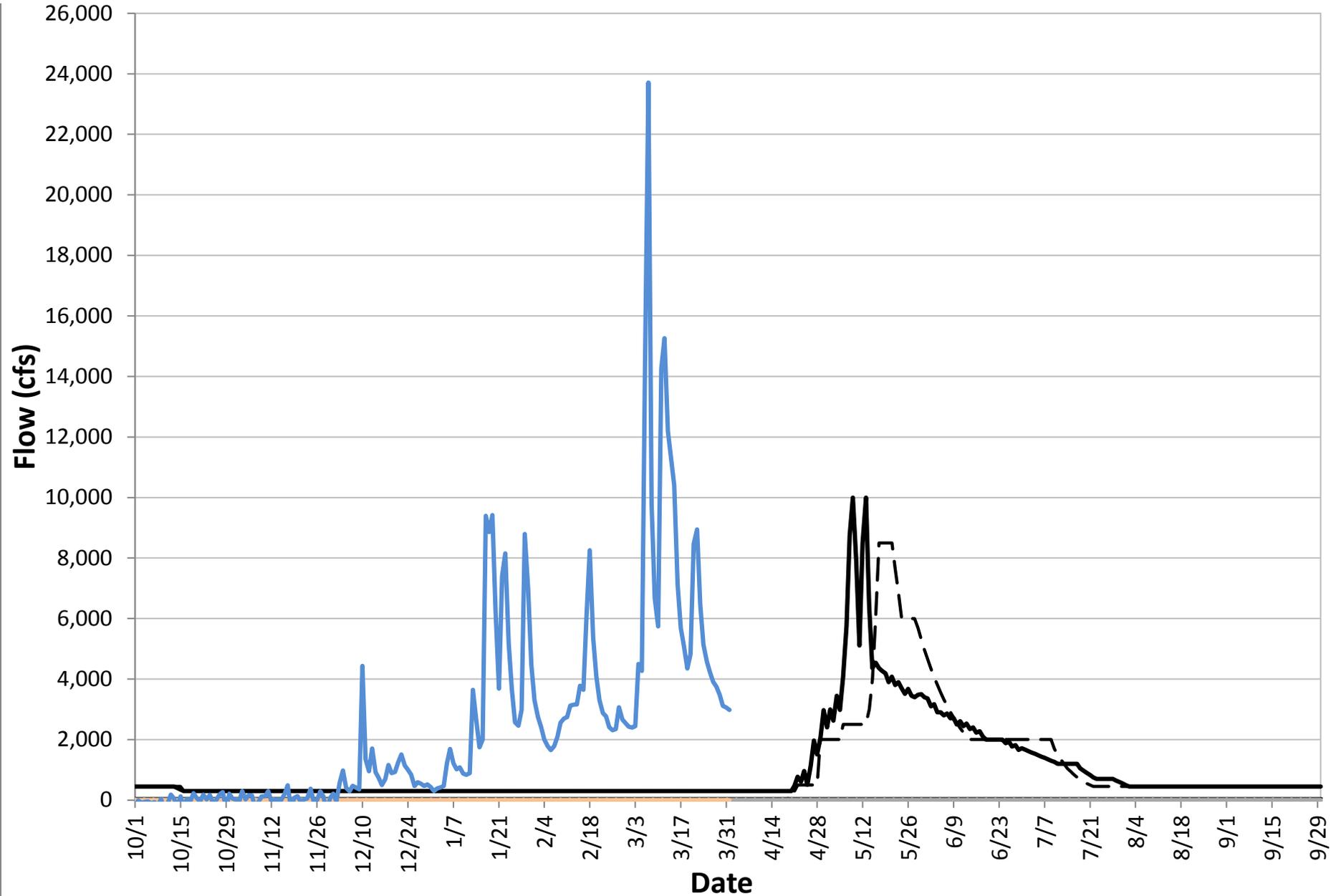
JPR = Joint Physical Riparian
BPR = Biological, Physical, Riparian

Workgroup
Recommended

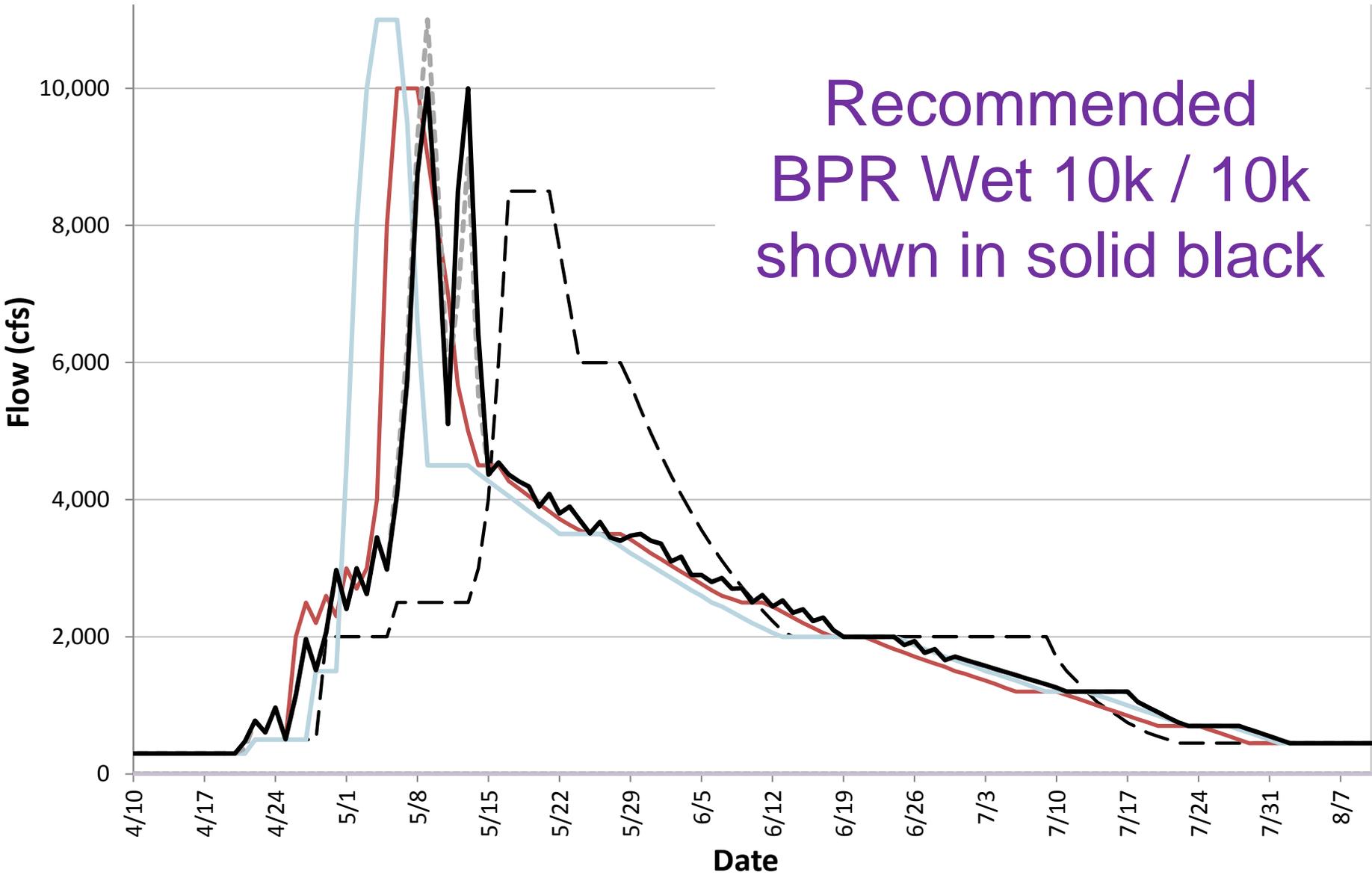
Pre-Dam Wet vs Proposed



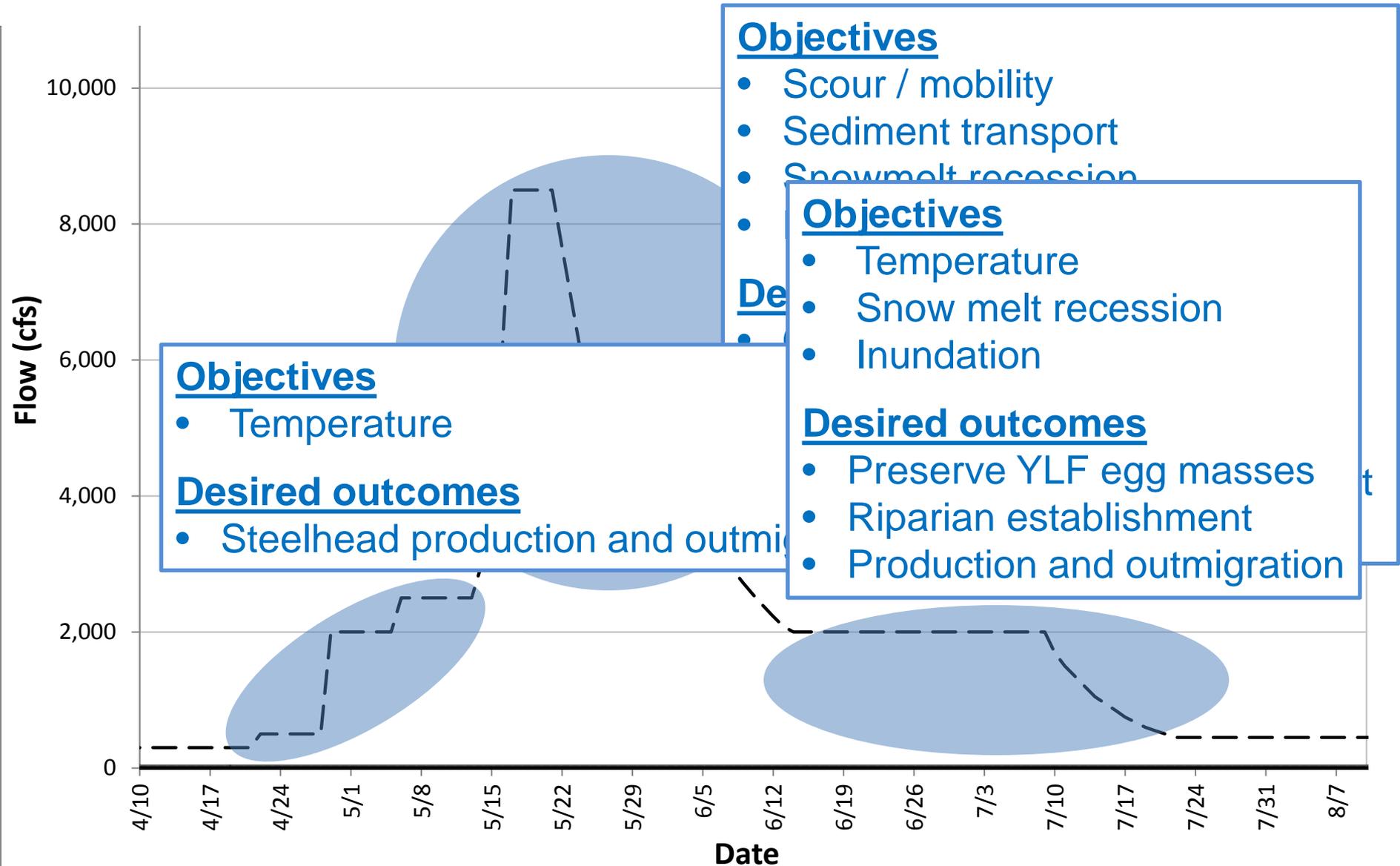
WY16 Inflow vs Proposed Wet



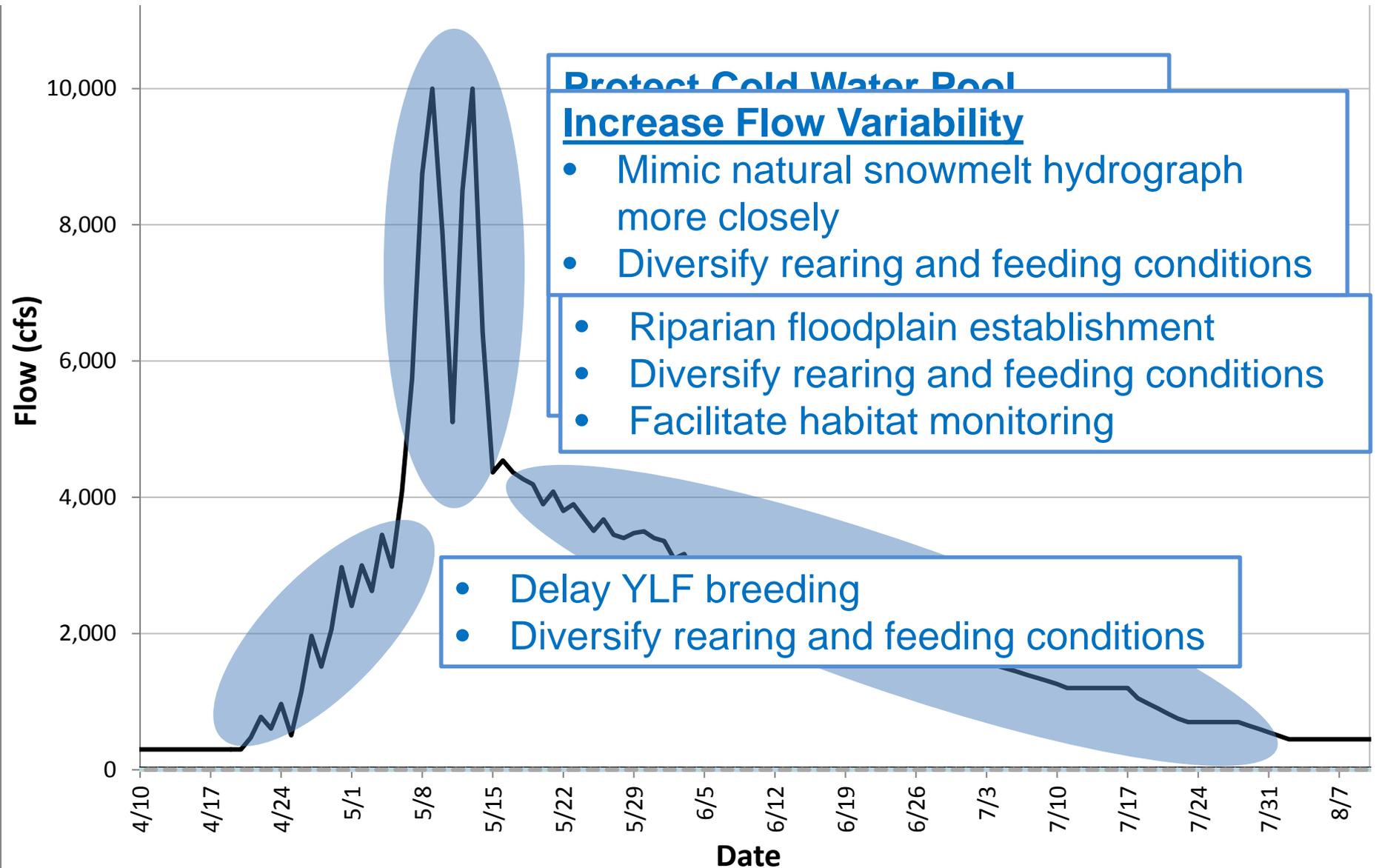
Hydrographs Considered - Wet



ROD Objectives (Wet)



Objectives in Addition to ROD



Supporting Analysis

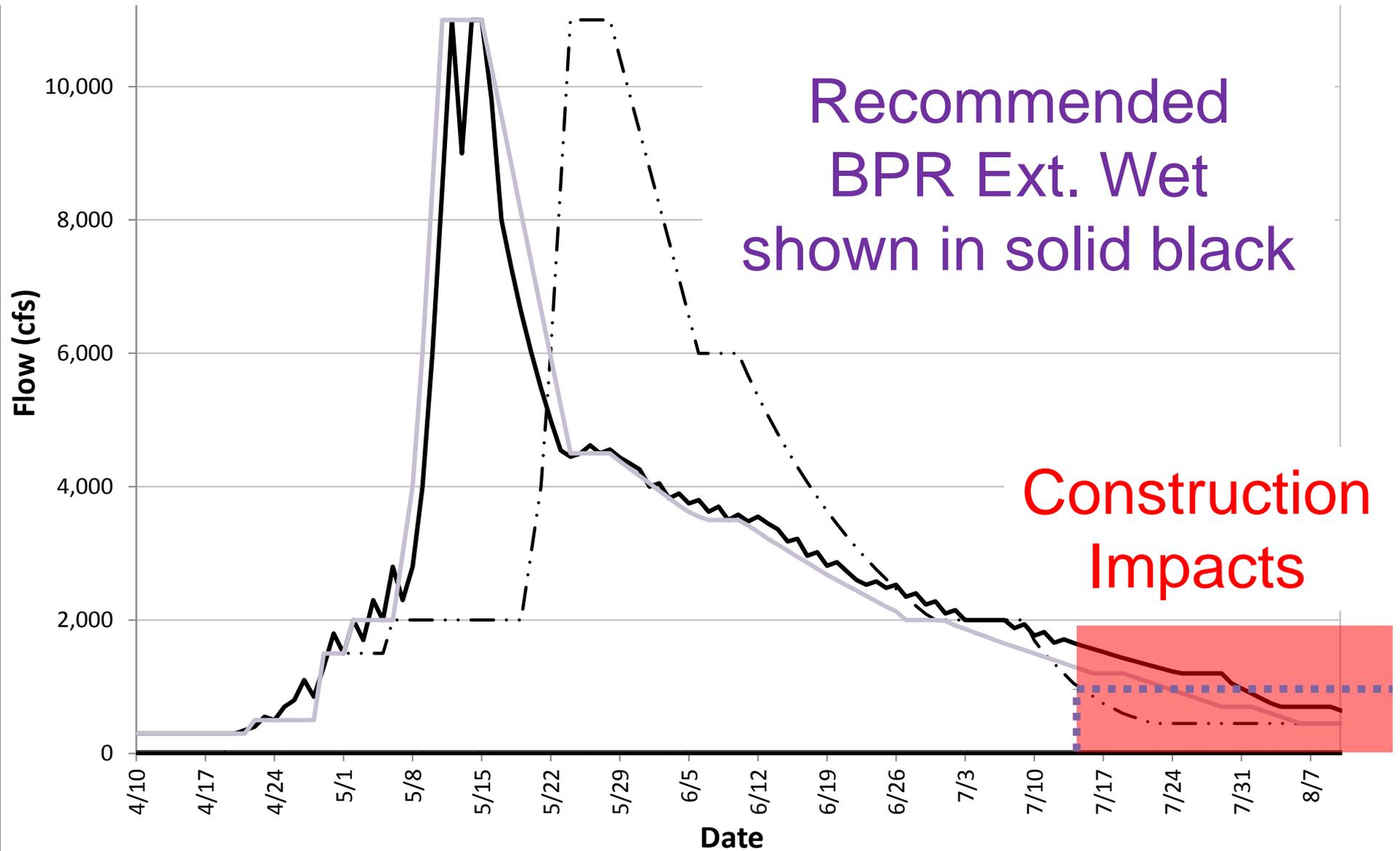
- Temperature
 - Modeling issue
 - Similar temperature response to recent years
- Smolt Outmigration
 - RT80 shifts by 1 day as compared to ROD
 - based on preliminary correlations with temperature
- Smolt Production
 - SSS model not yet available
- Sediment Transport
 - Hysteresis in single peaks

Learning Objectives Vs Monitoring

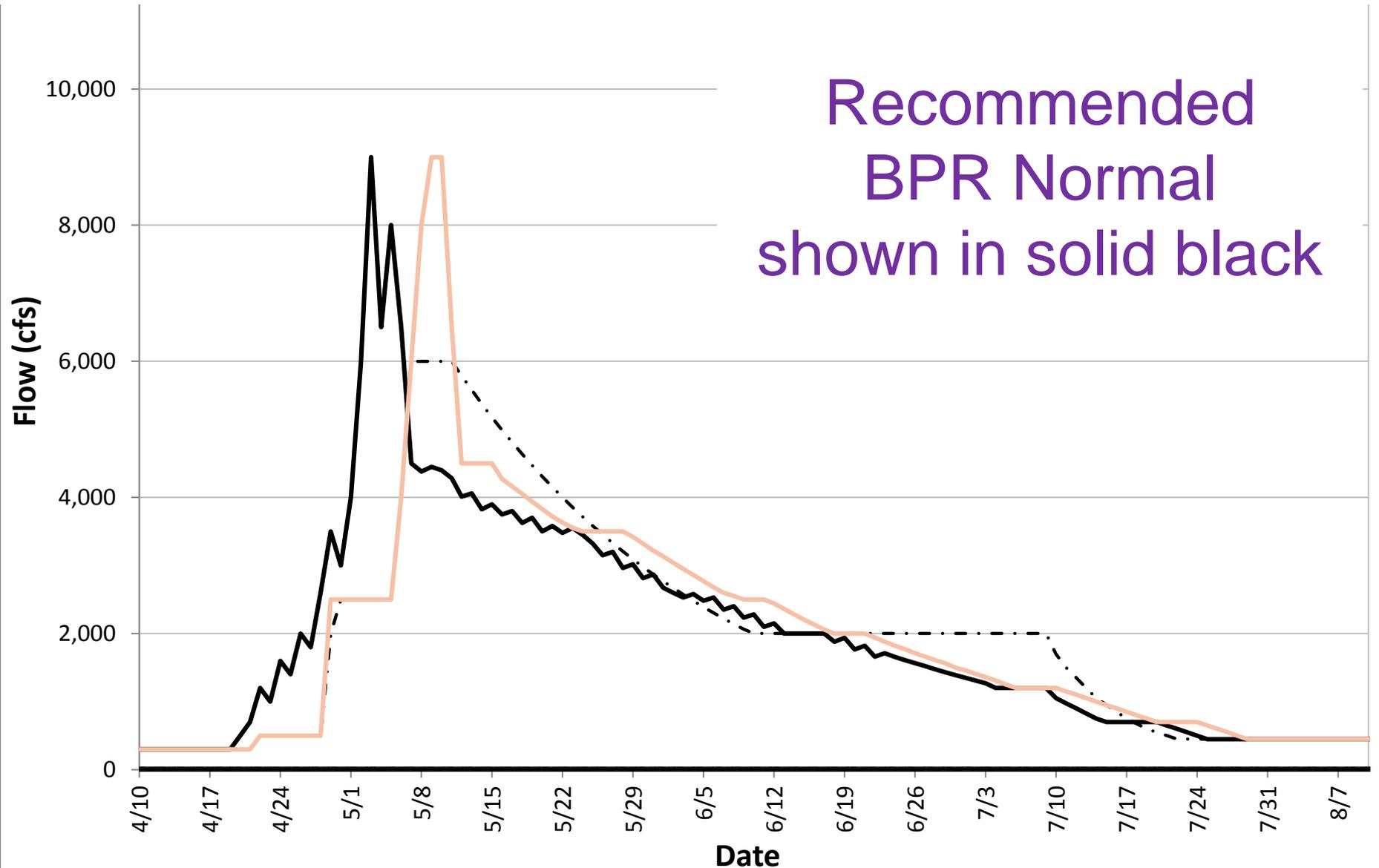
Desired Learning Objective	Monitoring		
	YES	Maybe	No
Dual peak dynamics	X		
Delta response	X		
Riparian establishment	X		
Improved systemic habitat estimates	X		
Delayed YLF Breeding		X	
Diverse rearing and feeding			X
Lower Klamath survival			X

**Not Covered by
Current Monitoring**

Hydrographs Considered - Ext. Wet



Hydrographs Considered - Normal



Precautionary Measures

(for Flows > 8,500 cfs)

- Flow Schedule
 - Peak flows on weekdays
- Real-time Field Monitoring
- Emergency Response Plan
 - Communications plan
 - Reclamation – Dam operators
 - County Sheriff
 - 911
 - Search and Rescue
- Public Notification

Gravel Augmentation Recommendation



Dave Gaeuman to Present

Flow Experiments and Learning

- Current
 - Ad-hoc process
 - No written study plans
 - Monitoring limited to recurring long-term monitoring
- Proposed
 - Uncertainties to test are prioritized
 - Written study plans developed in advance
 - Management action, experimental design, monitoring, analysis, and budget
 - Budget flexibility to implement
 - Water year specific budget line item

FY17 Science Funding Recommendation

The TMC should elevate the FY17 “emergency science” budget line item proposed by the Fish Workgroup but prioritized low by the IDT. The funds would be used for water year specific monitoring needs associated with the flow releases. The workgroup recommended \$120,000 (commensurate with the FY16 funding for a DSS lead). The flow workgroup is committed to develop written study plans for one or more proposed flow experiments in FY17 that could utilize these funds.

Workgroup tasks for the coming year

- Incorporate DSS models into flow scheduling
- ID Synthesis reports
 - Documents existing learning
 - Staff time to write is not yet identified
- Develop flow experiment portfolio
 - Multiple water year types
 - Hydrographs
 - Learning objectives
 - Study plans (monitoring and analysis)
 - Budget
 - Directs water year specific fund expenditures
- Participate in annual budget development

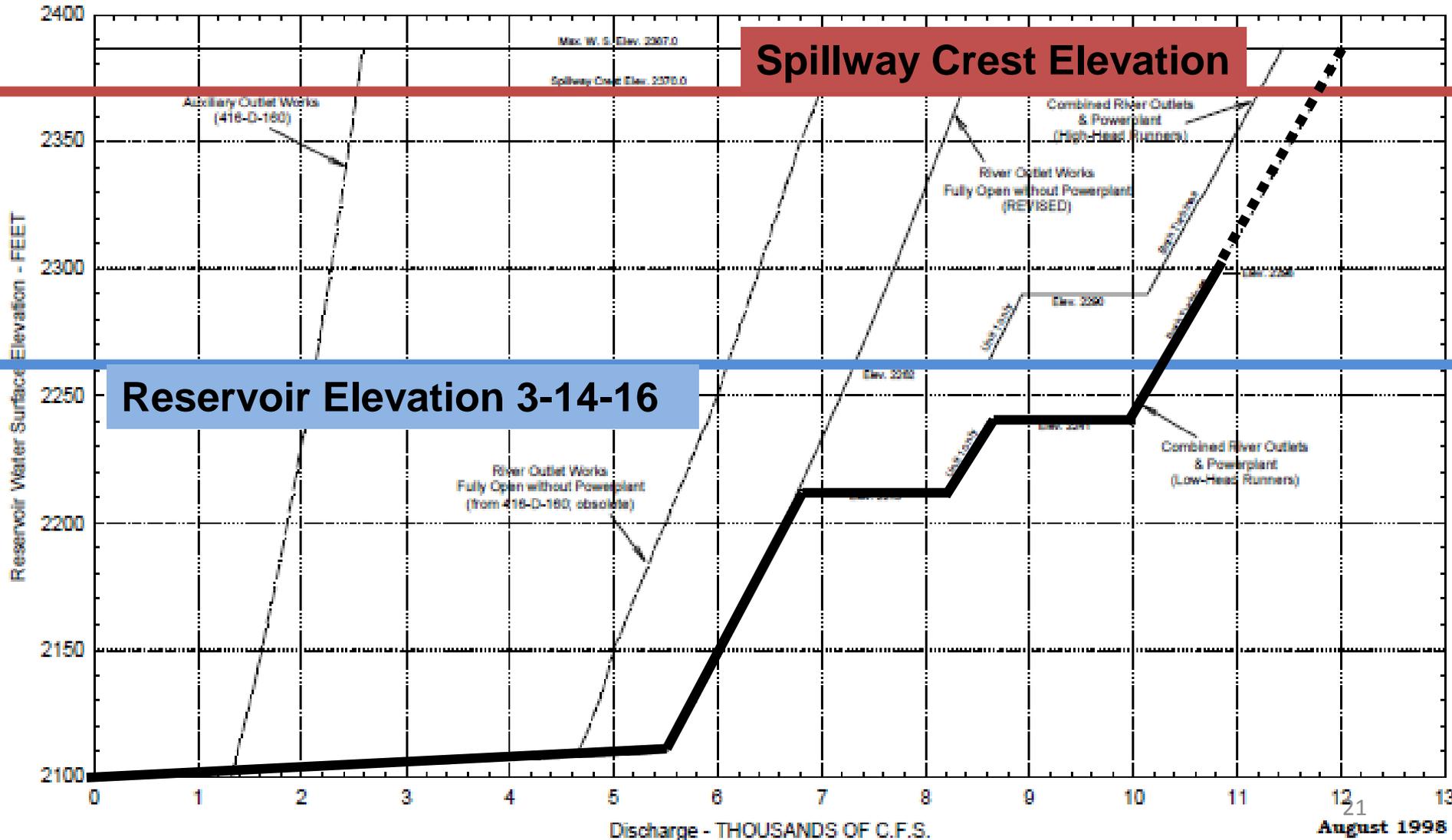
Questions?



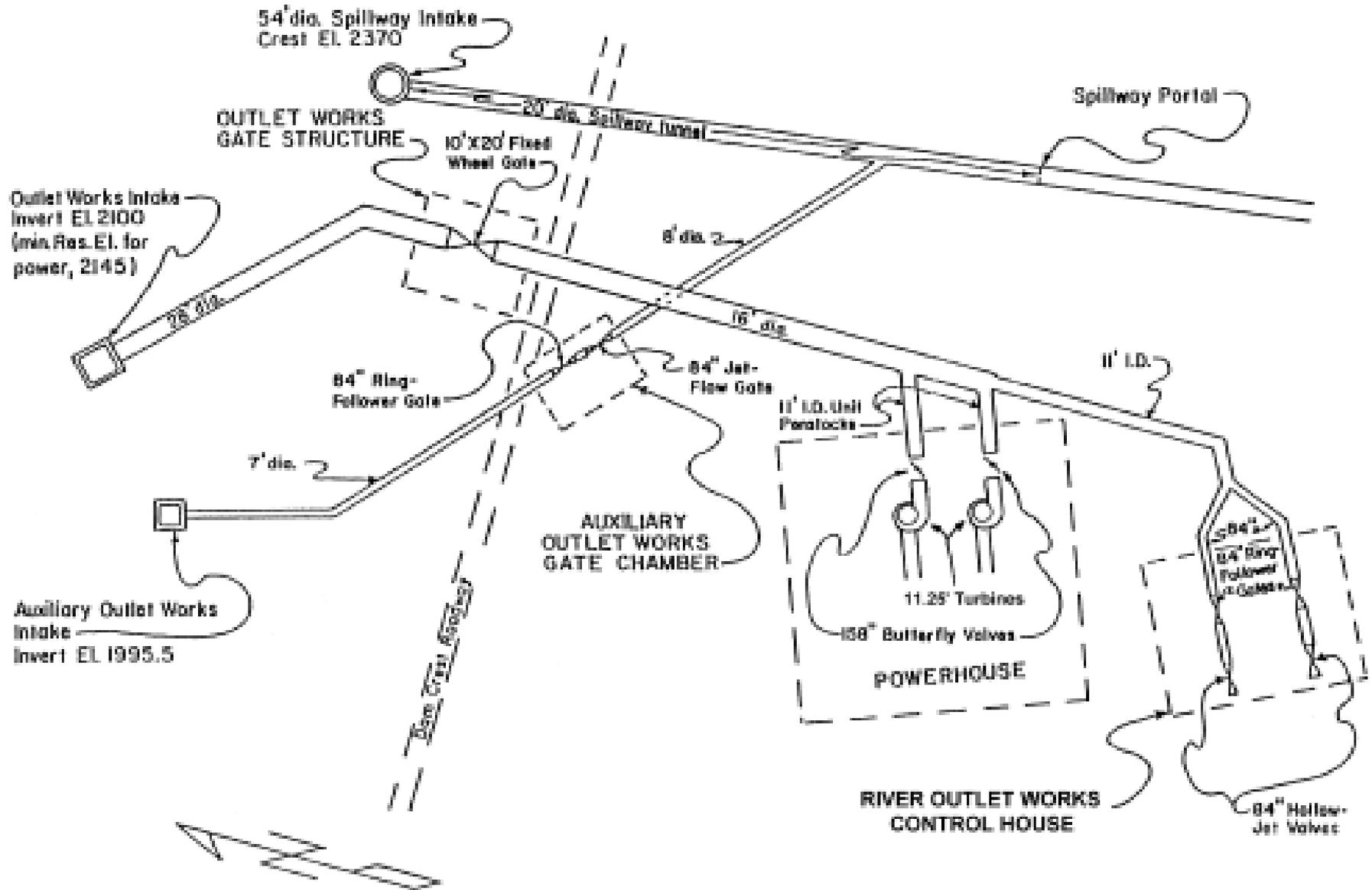
Trinity Dam Discharge Curve

(source: Wahl and Cohen 1999)

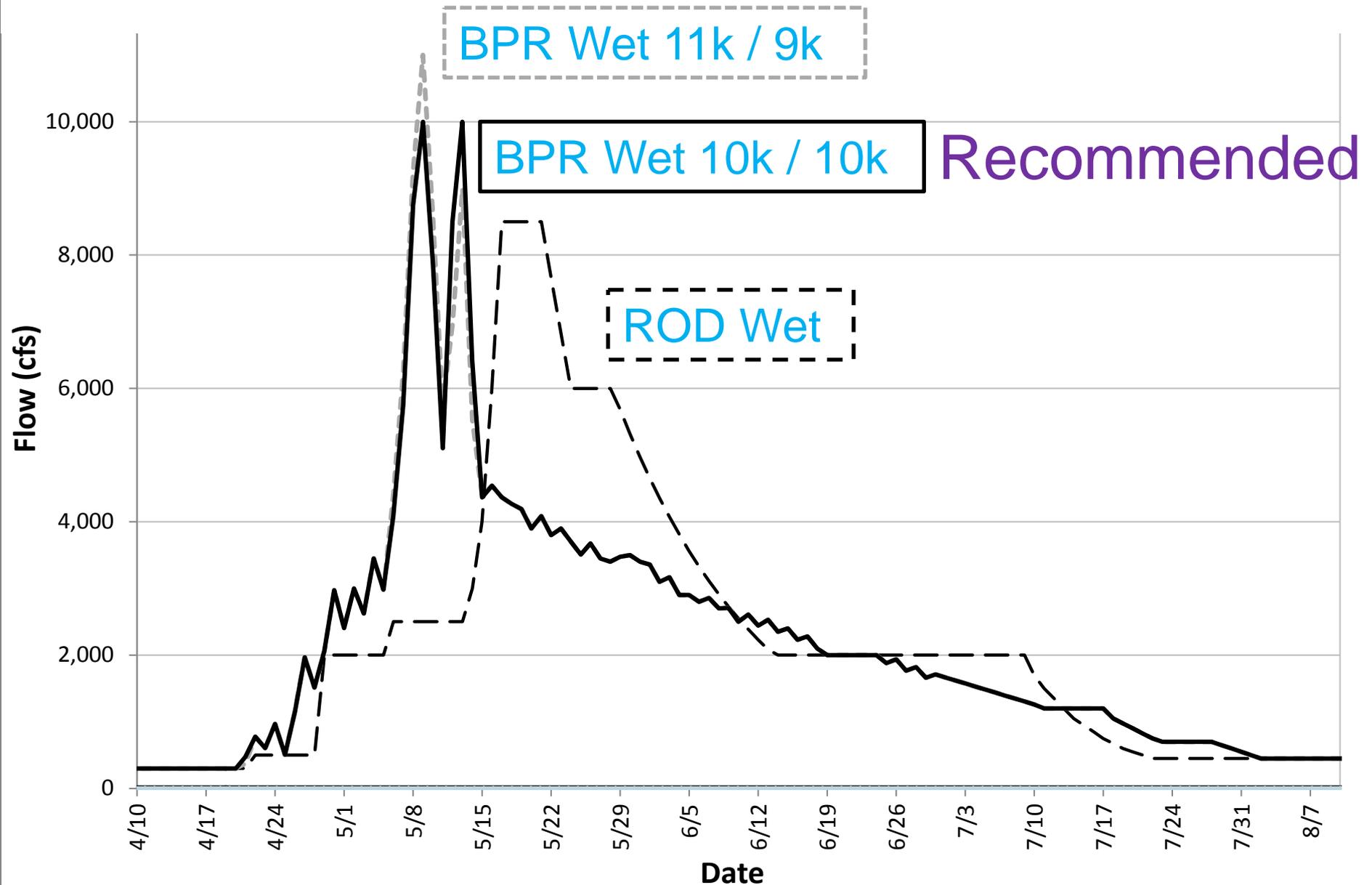
TRINITY DAM - Controlled Release Discharge Curves



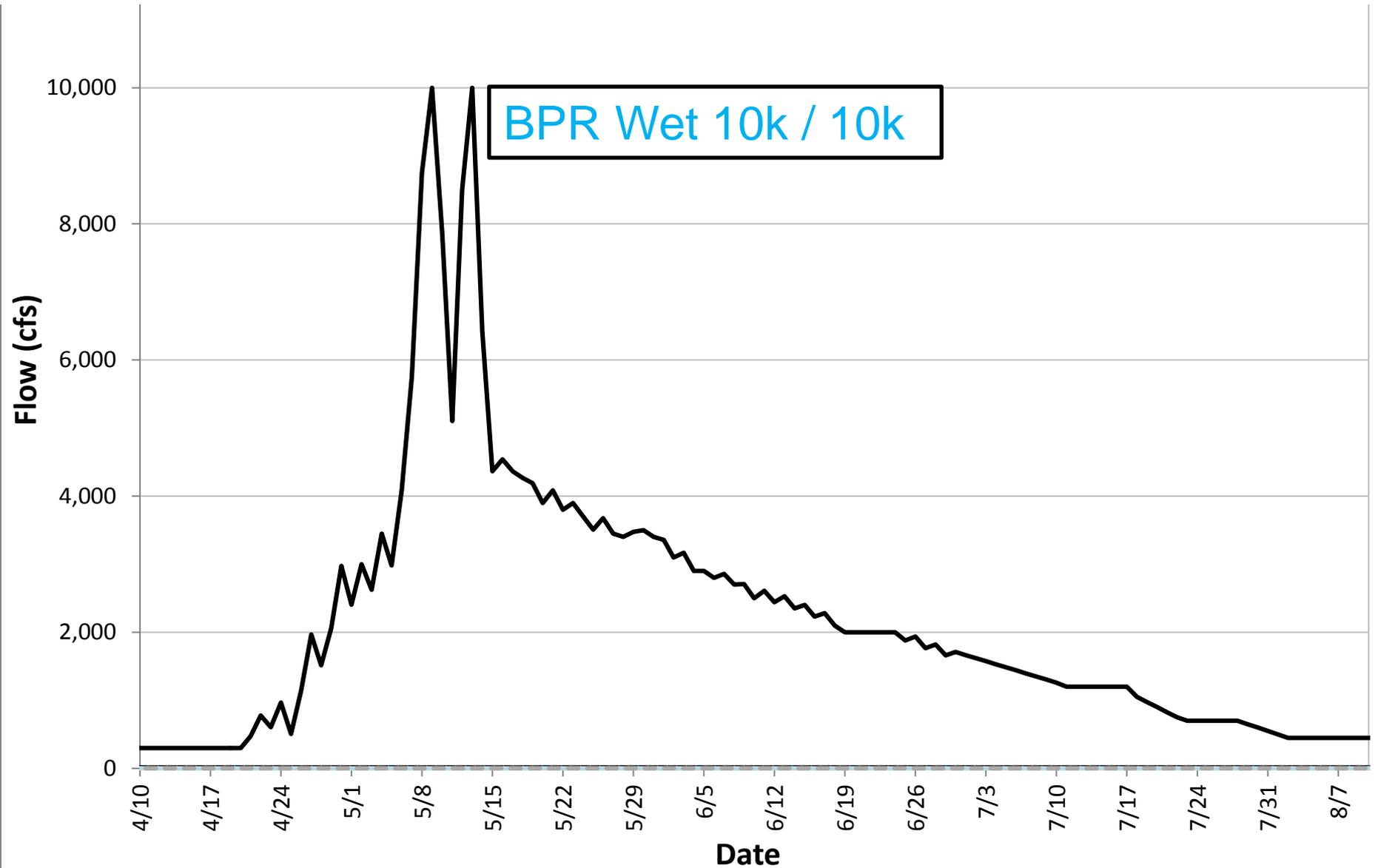
Trinity Dam Outlet Works



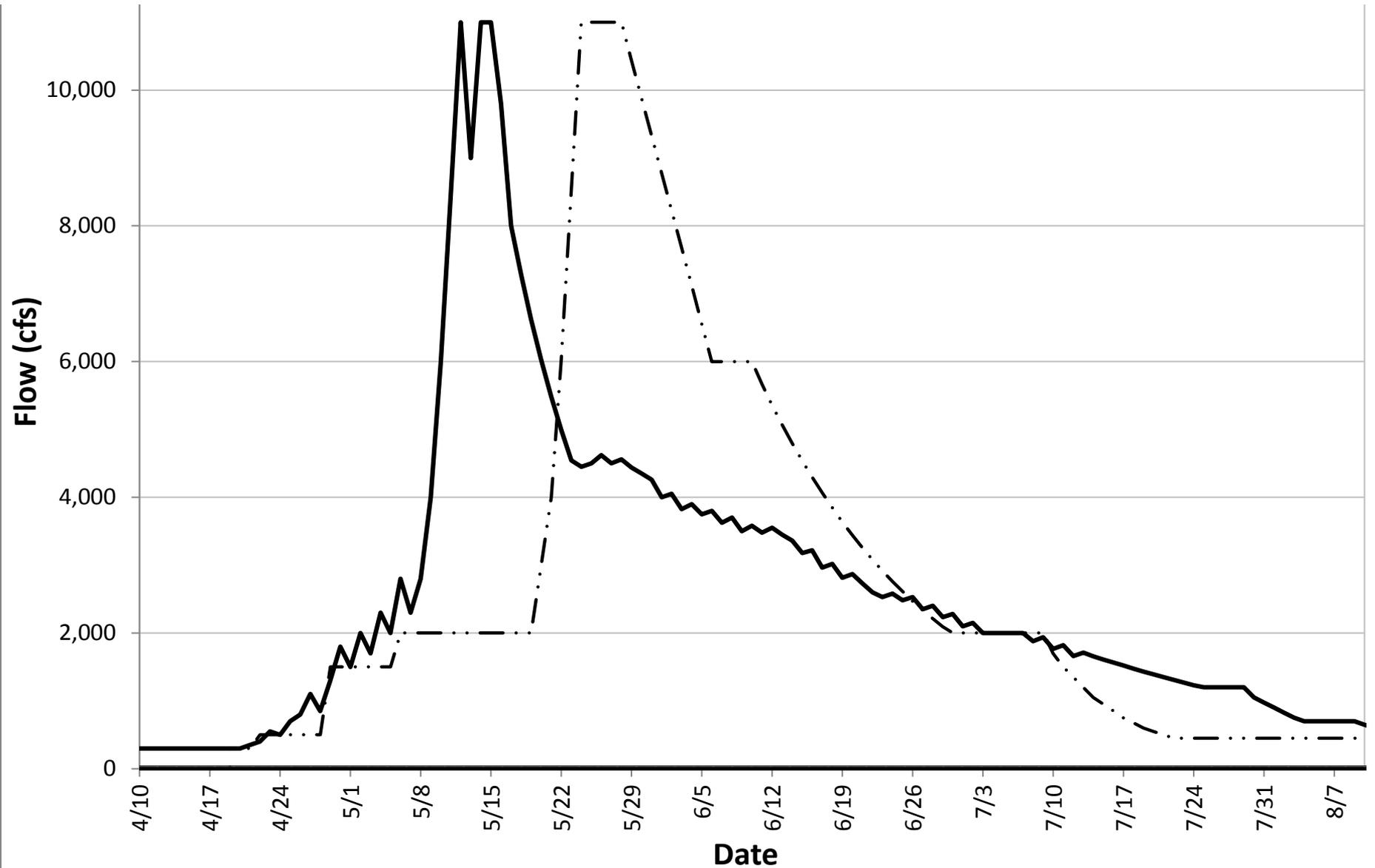
Wet Year Recommendation



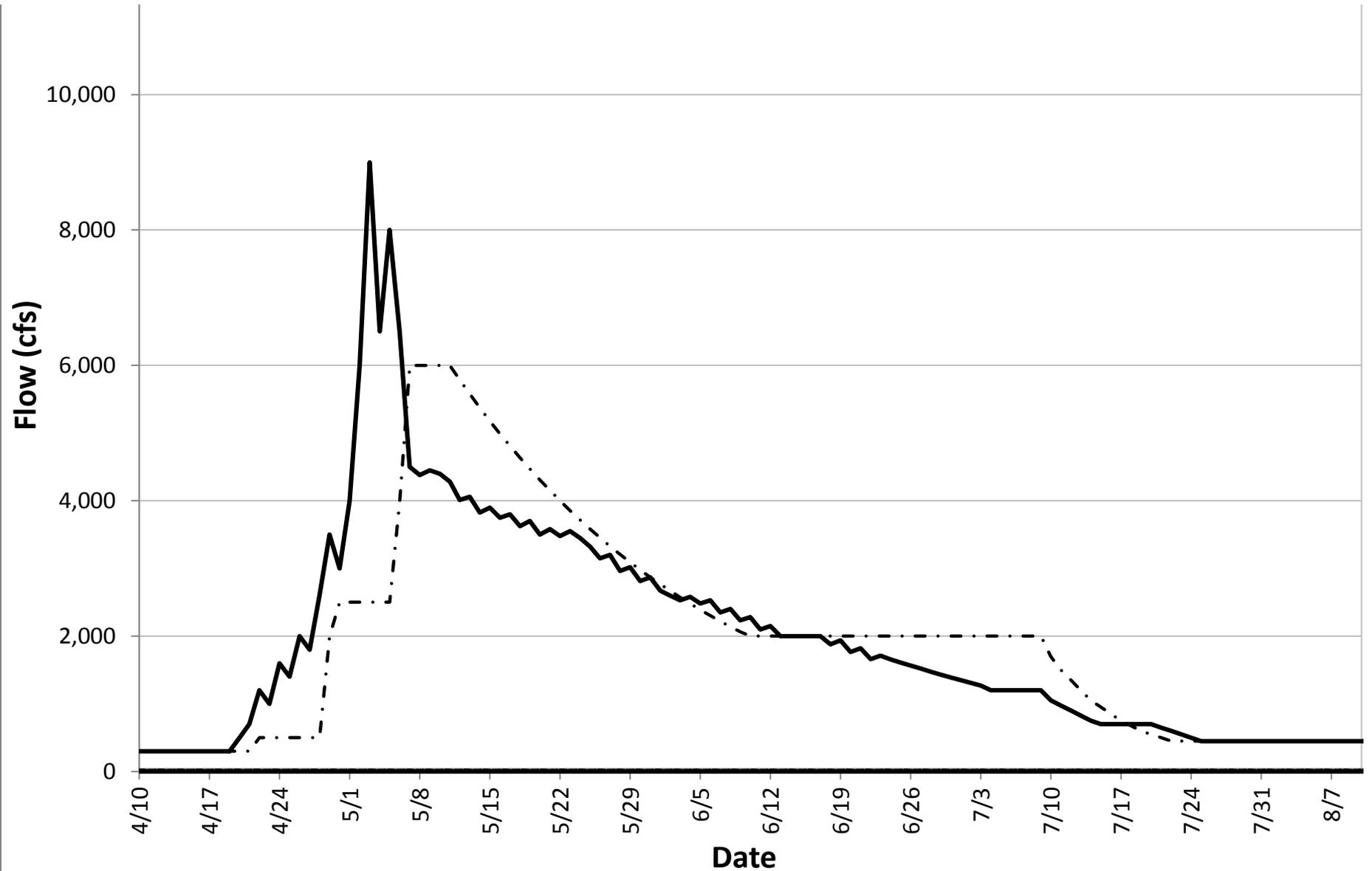
Wet Year Recommendation



Extremely Wet Year Recommendation



Normal Year Recommendation



High Flow Monitoring

- riparian band transects
- scour / mobility transects
- sediment transport monitoring
 - External research on surrogate sediment monitoring technologies.
- gravel tracers at Lewiston and lowden
- real-time bathymetry at lowden
- delta re-surveys
- frog breeding
- update 40 mile bathymetry
 - WSE and velocity monitoring to update SRH 40 mile model needs to be investigated
- WSE and velocity at pilot sites in lower river (below north fork) to help calibrate SSS model extension.

Temperature Objectives

Source	Target Area	Dates	Temperature Objective ¹
Basin Plan for the North Coast Region (Regional Water Quality Control Board, 1994)	<ul style="list-style-type: none"> Lewiston to Douglas City (rkm 178.2 to 148.5) Lewiston to Douglas City (rkm 178.2 to 148.5) Lewiston to the Confluence of the North Fork Trinity River Confluence (rkm 178.2 to 117.6) 	<u>All Years</u>	
		<ul style="list-style-type: none"> July 1 to September 15 	≤ 15.5
		<ul style="list-style-type: none"> September 15 to September 30 	≤ 13.3
		<ul style="list-style-type: none"> October 1 to December 31 	≤ 13.3
Spring-Time Objectives of the Record of Decision for the Trinity River EIS/EIR (USFWS et.al., 2000)	<ul style="list-style-type: none"> Lewiston to Weitchpec (rkm 178.2 to 0.1) 	<u>Normal and Wetter Water Years:</u>	
		<ul style="list-style-type: none"> April 15 to May 22 	≤ 13.0
		<ul style="list-style-type: none"> May 23 to June 4 	≤ 15.0
		<ul style="list-style-type: none"> June 5 to July 9 	≤ 17.0
		<u>Dry and Critically Dry Water Years:</u>	
		<ul style="list-style-type: none"> April 15 to May 22 	≤ 15.0
<ul style="list-style-type: none"> May 23 to June 4 	≤ 17.0		
		<ul style="list-style-type: none"> June 5 to June 15 	≤ 20.0

¹ = Average daily water temperature in degrees Centigrade

Modeled Trinity River Water Temperatures in Support of the Flow Scheduling Process
March 17 & March 28th, 2011
Scenario Matrix:

Date	Flow Alternative: Dam Hydrology	Lewiston Dam Release Temperature (F)	Periods & Locations of Interest	Hypothetical Hydro-Meteorology
March 17 ^a	Normal (ROD) ^b NORM A NORM B NORM C	Assumed: 50	Spring & Early Summer: Lower River -Weitchpec Summer & Early Fall: Upper River: Douglas City & Conf. of the N .Fork Trinity R.	Average tributary accretion w/average meteorology & Dry tributary Accretion w/extreme warm meteorology
	WET (ROD) ^b WET A WET B WET C WET D	Assumed: 50		
March 28 ^c	WET (ROD) - WET GEO 1 WET GEO 2 WET RIP 1	Regression-Derived for April 15 to July 22 July 22 to Sept 16 assumed to be 50 .	Spring & Early Summer: Lower River –Weitchpec Summer & Early Fall: Upper River: Douglas City (only)	Average tributary accretion w/average meteorology & Average tributary Accretion w/extreme warm meteorology

a = These results have been superseded by March 28 simulations. Presentation available upon request.

b = hydrology plots are shown in Appendix E.

c = Full presentation available upon request

Purpose of BRP Wet

1. test the effect of multiple flow peaks on sediment transport
2. achieve temperature and smolt migration objectives for a wet water year
3. provide a flow schedule that more closely mimics a natural flow regime including variable peaks and daily fluctuations similar to snowmelt
4. provide diverse rearing and feeding conditions for salmonid juveniles and smolts
5. discourage early breeding of the foothill yellow legged frog (YLF)
6. provide a recession limb to create the opportunity for regeneration to coincide with a well-timed seed dispersal event.