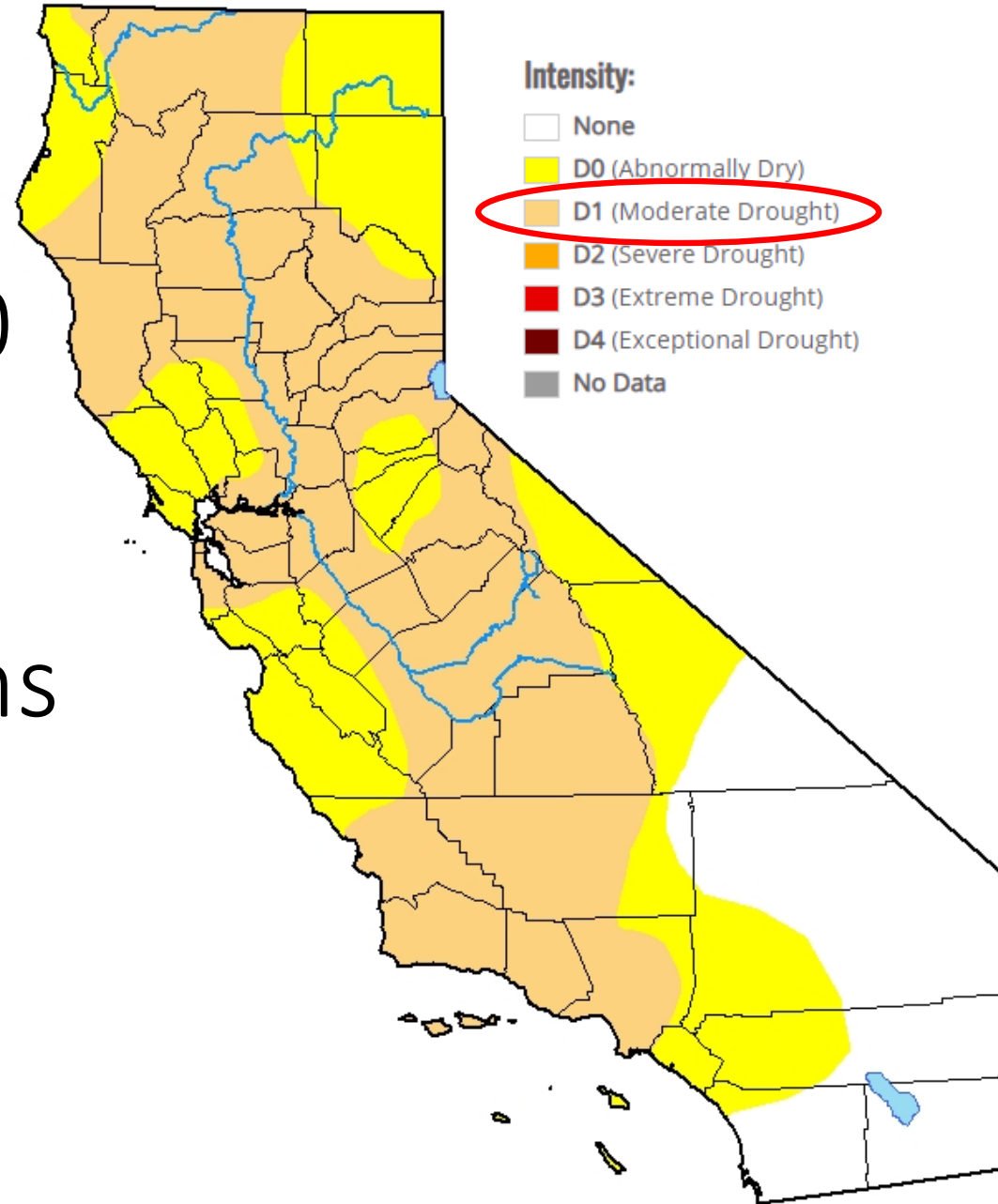




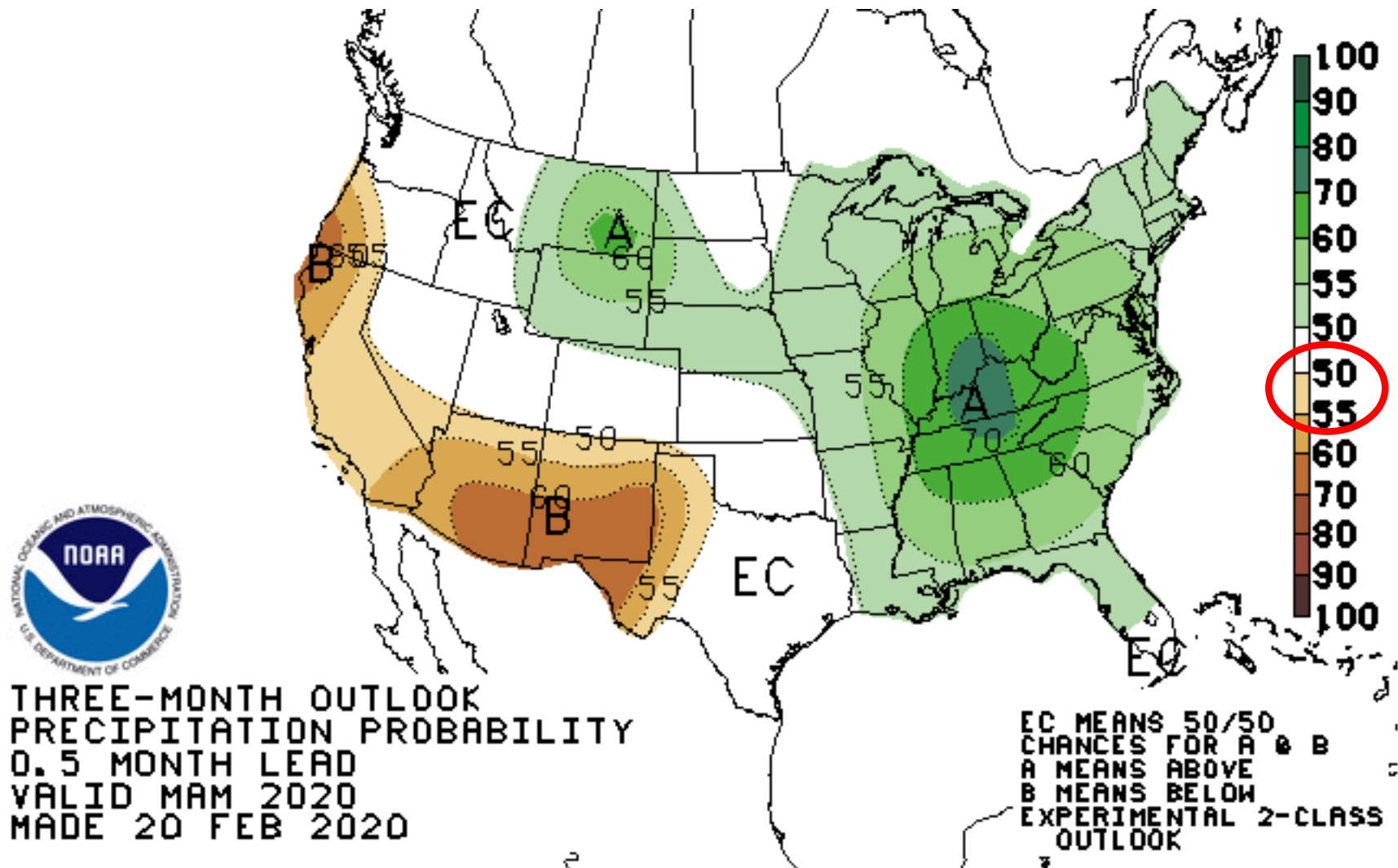
Water Year 2020 Flow Schedule Technical Recommendations



Trinity Management Council meeting,
Weaverville, California
March 18, 2020

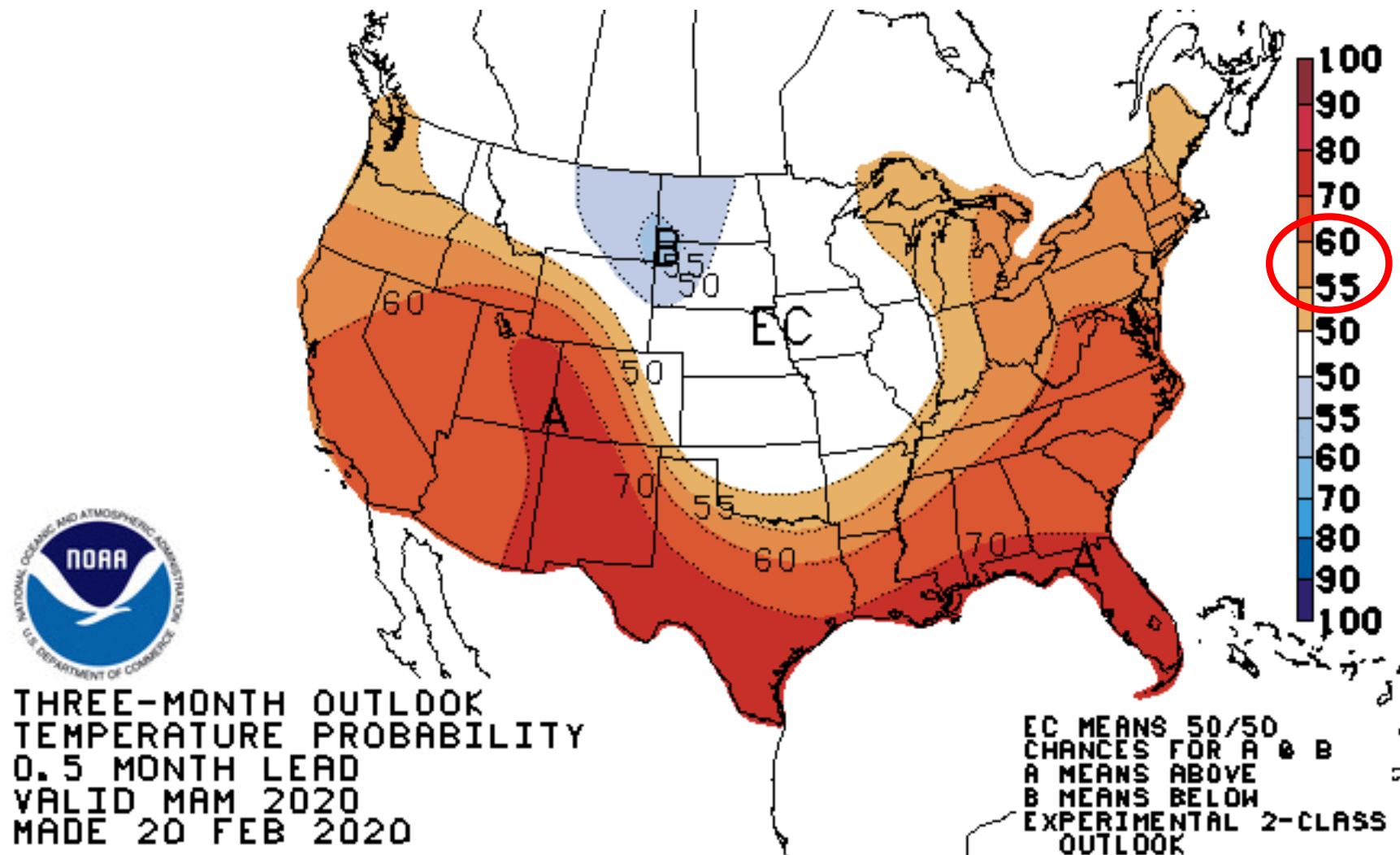
3-month precipitation probability

(National Oceanic and Atmospheric Administration)



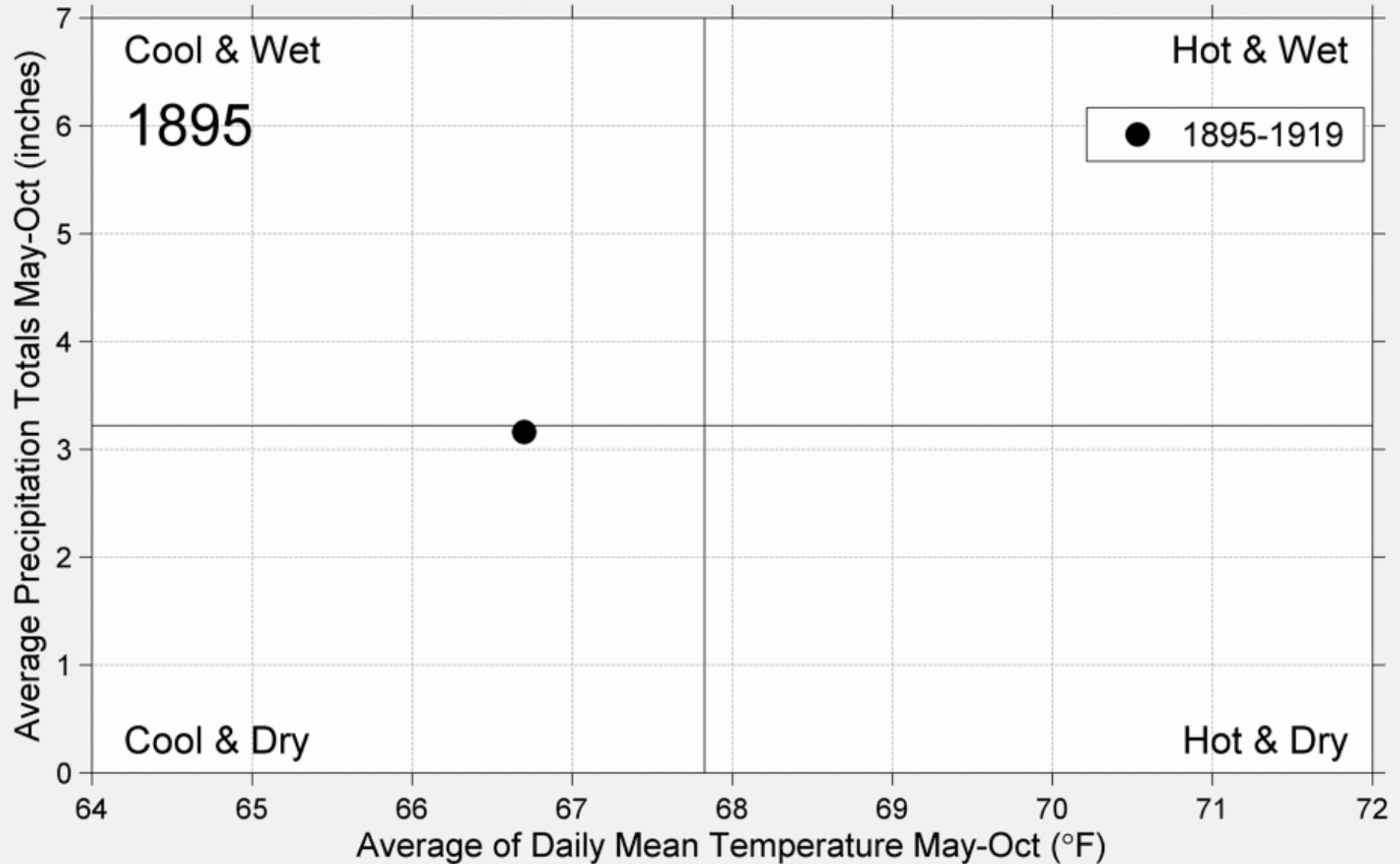
3-month temperature probability

(National Oceanic and Atmospheric Administration)



California Fire Season Weather

Average Temperature and Precipitation May-Oct



□ 10 Largest Wildfires

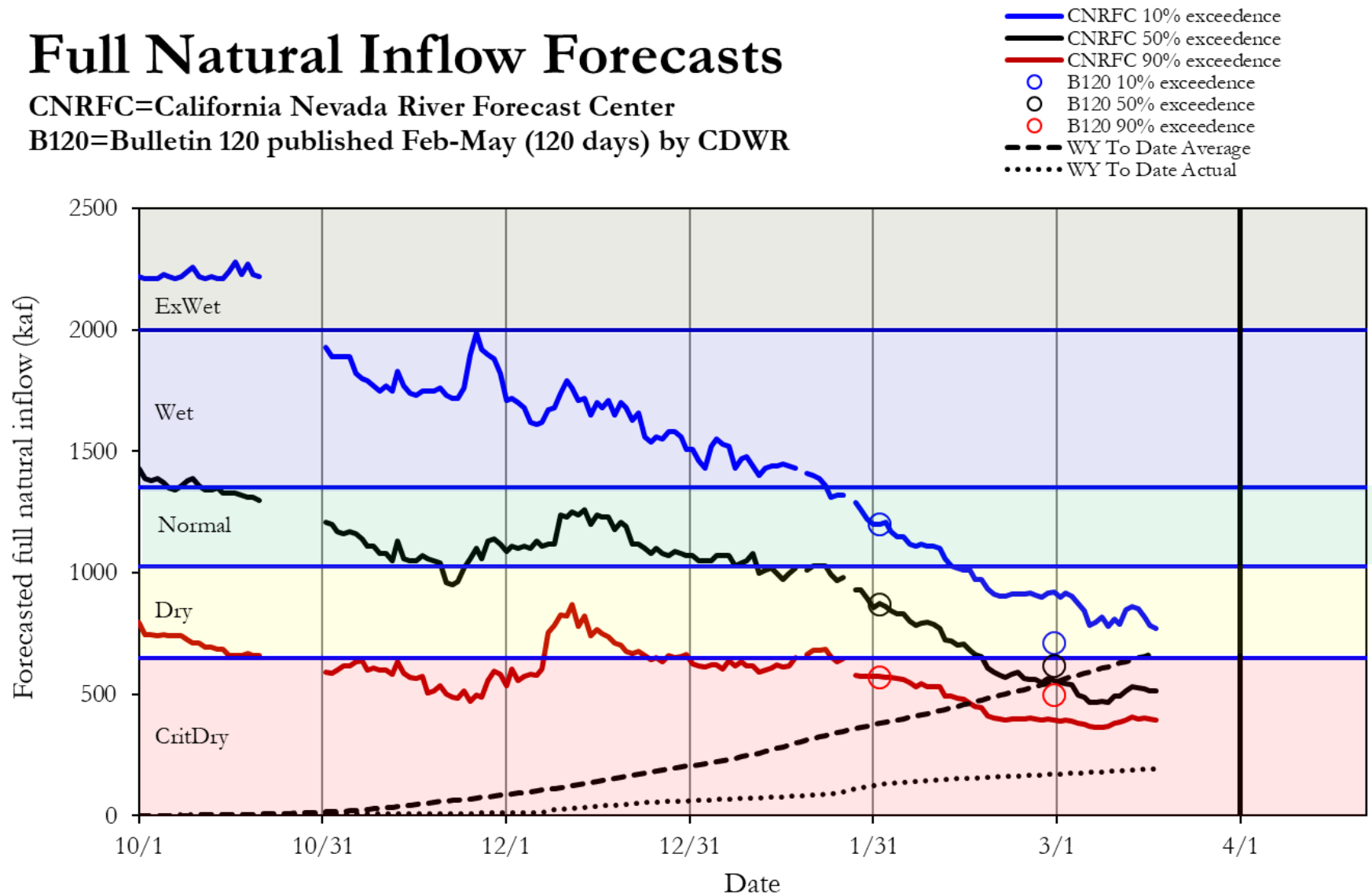
◇ 10 Most Destructive Wildfires



Full Natural Inflow Forecasts

CNRFC=California Nevada River Forecast Center

B120=Bulletin 120 published Feb-May (120 days) by CDWR



Primary differences between forecast methods is the B120 projects median precipitation and snow whereas the CNRFC incorporates forecasts of upcoming weather into their model.

March 17th CNRFC
daily forecast

10%
394 kAF

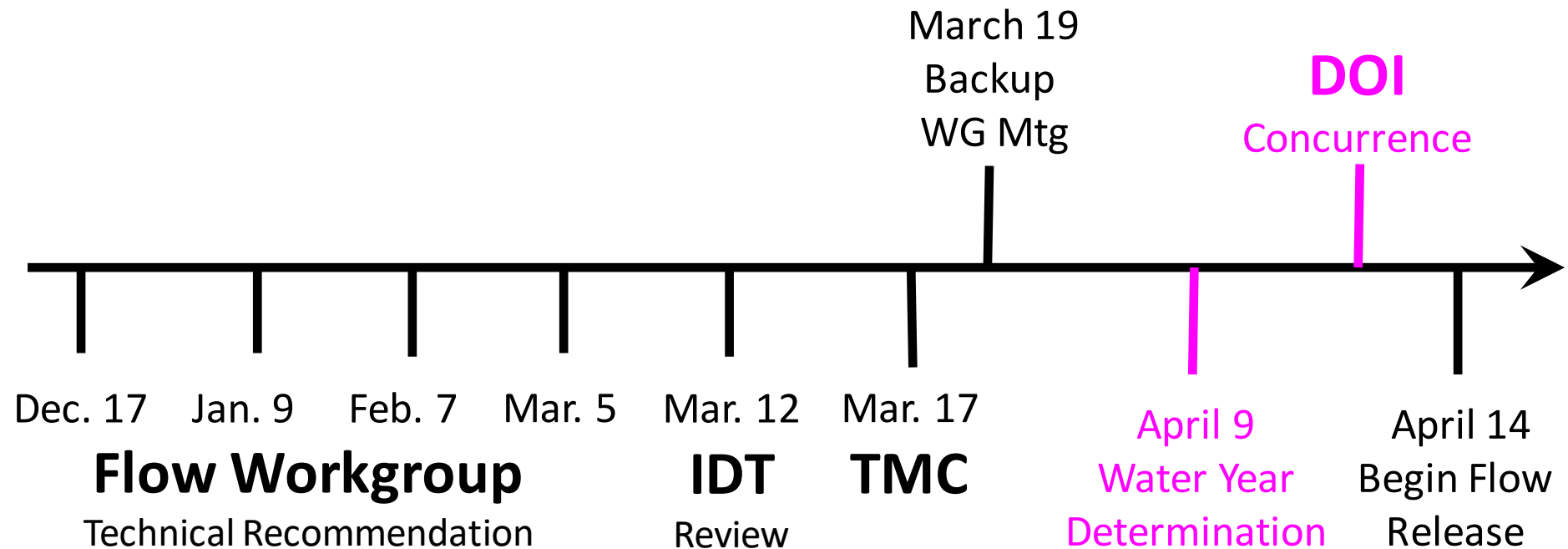
50%
516 kAF

90%
769 kAF

Water Year (WY) Type	Annual Basin Runoff Above Lewiston Gage (kAF)	ROD Water Allocation (kAF)	Probability of Occurrence
Critically Dry	< 650	369	12%
Dry	650 – 1,024	453	28%
Normal	1,025 – 1,349	647	20%
Wet	1,350 – 1,999	701	28%
Extremely Wet	≥ 2,000	815	12%

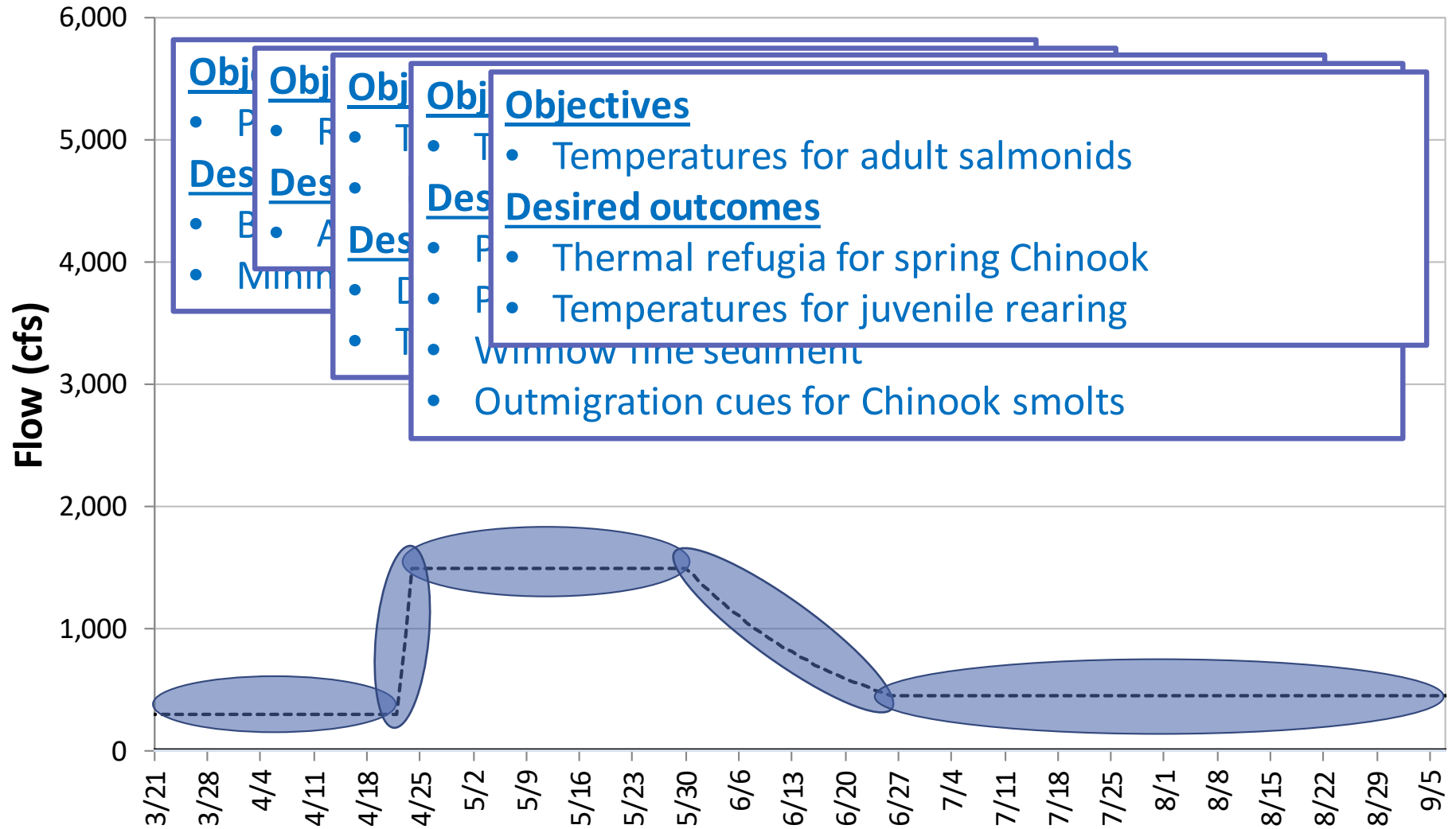
WY 2020 Hydrograph Development

Proposed Flow Releases



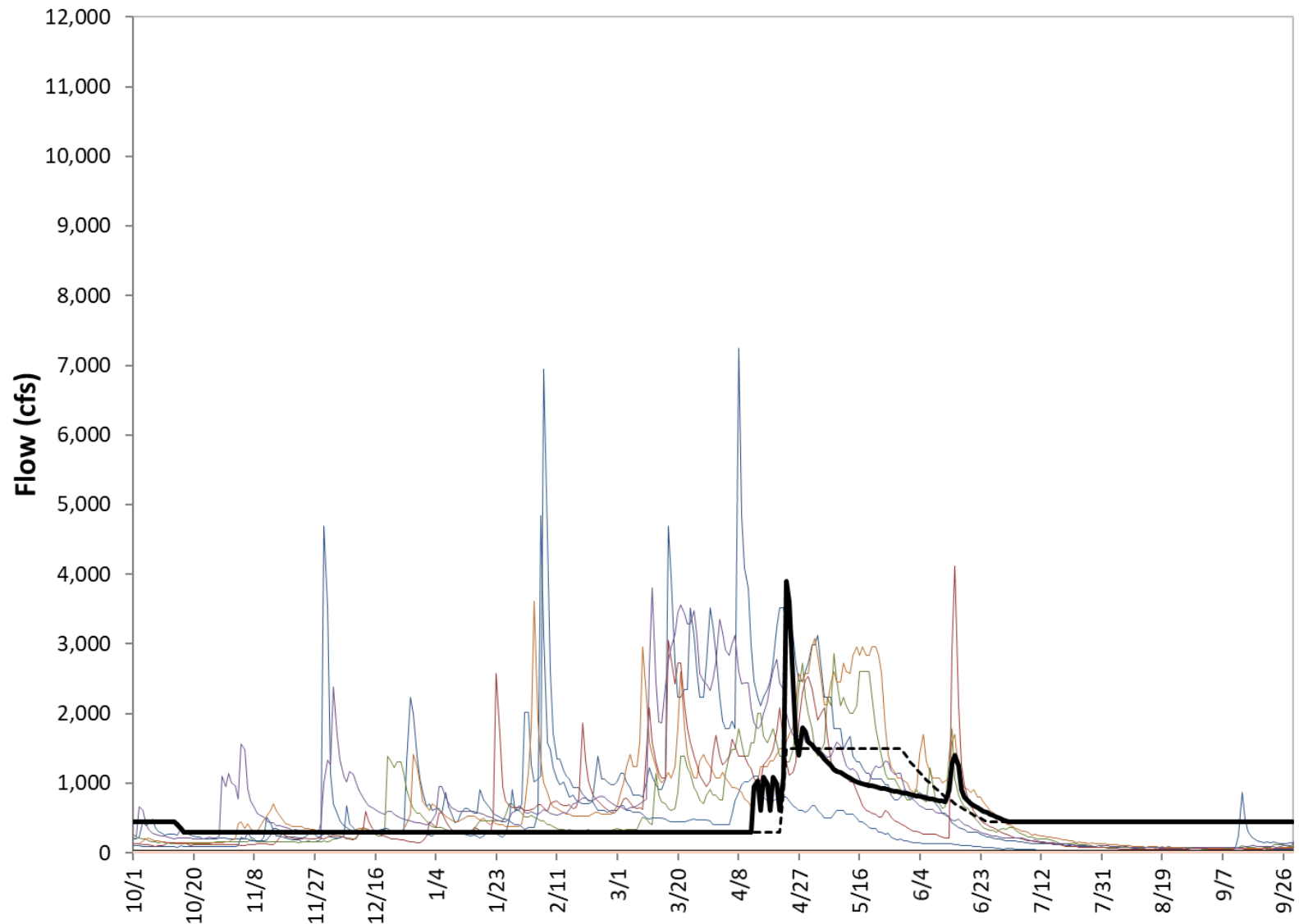
- Flow workgroup evaluated 1 proposed hydrograph for a **critically dry** WY and 1 proposed hydrograph for a **dry** WY
- Evaluations included workgroup discussions of hydrograph objectives and modeling

ROD objectives for Critically Dry

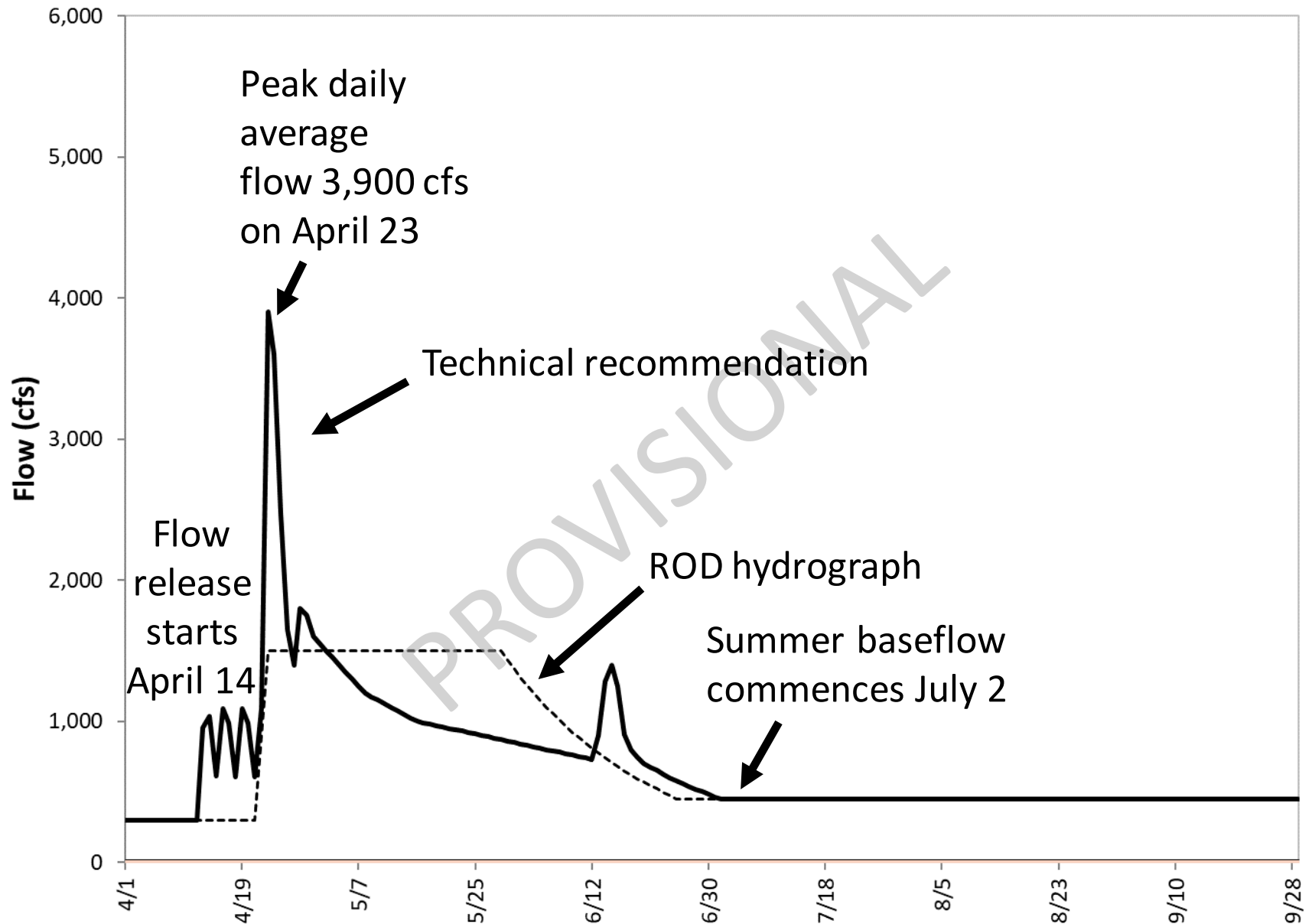




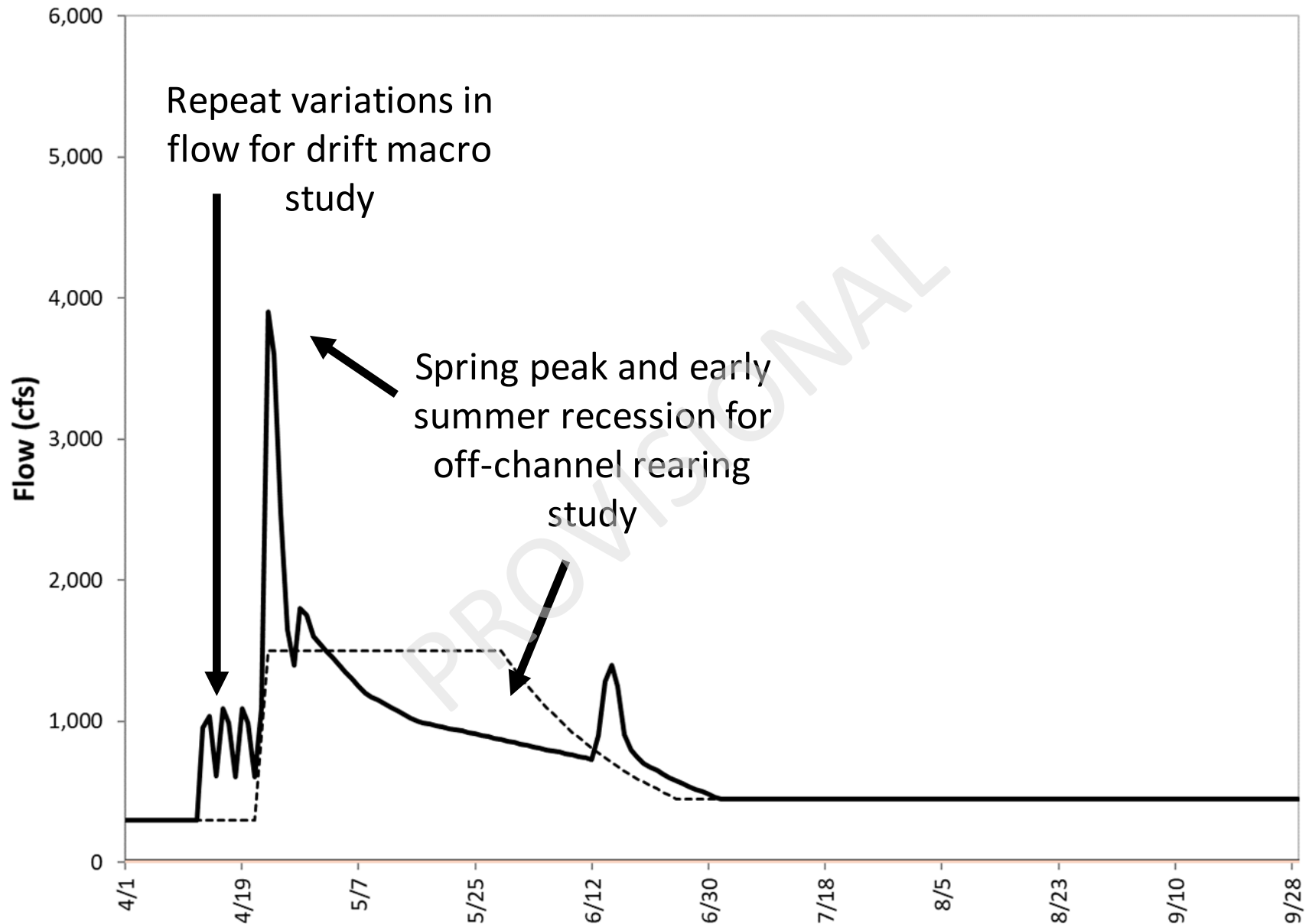
ROD, recommended **Critically Dry** hydrograph and pre-dam flows at Lewiston



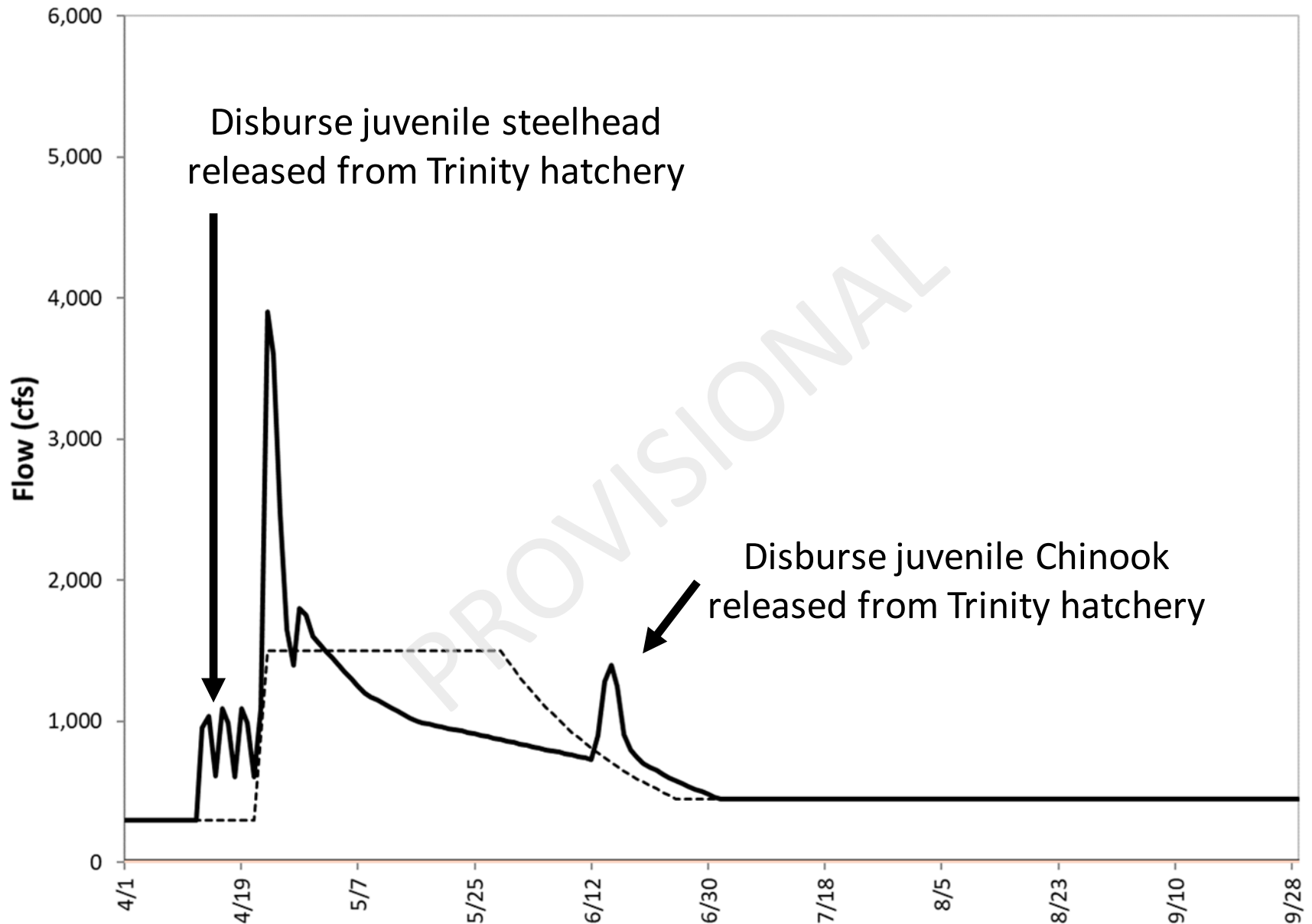
Technical Recommendation: Critically Dry



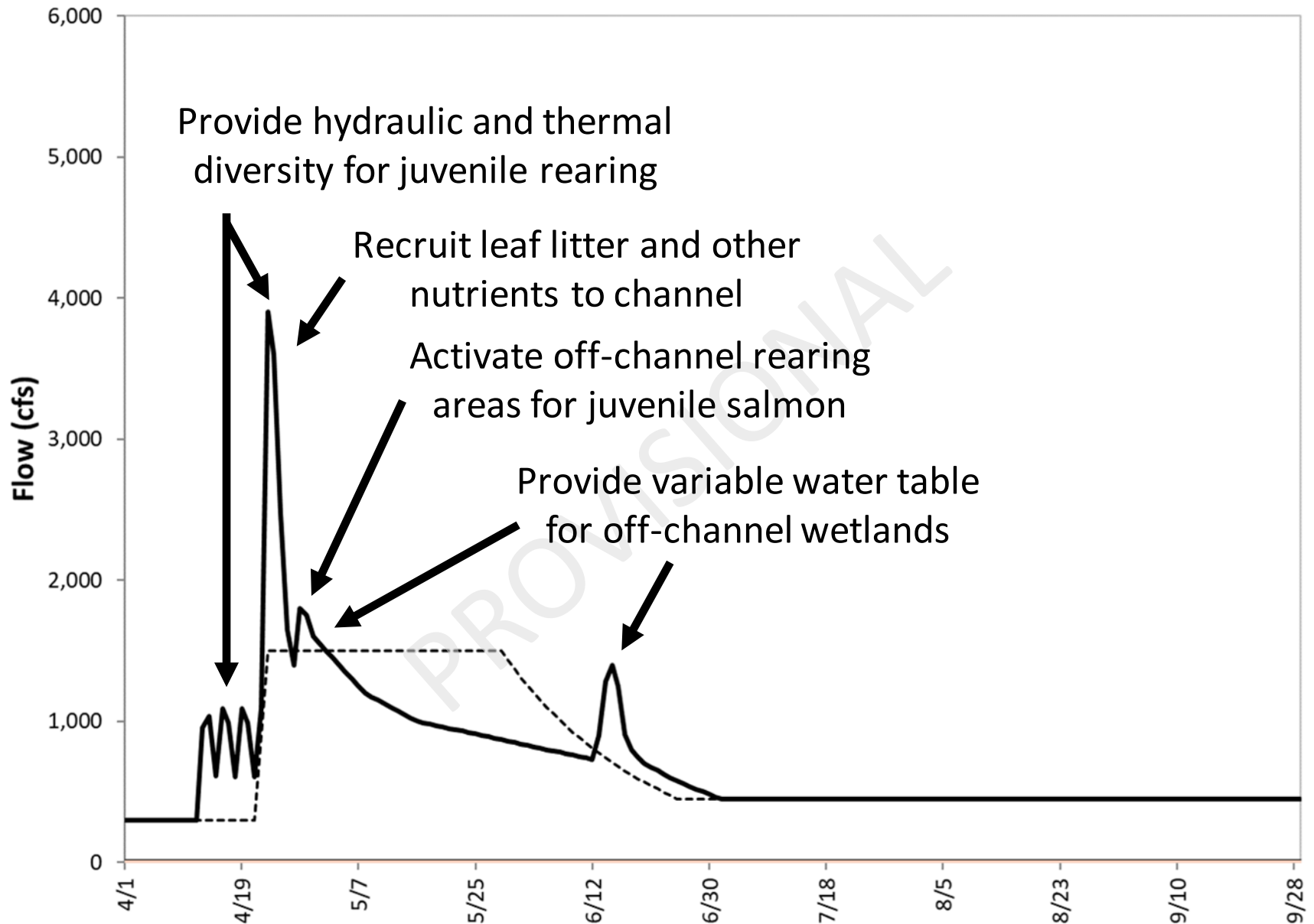
Technical Recommendation: Critically Dry



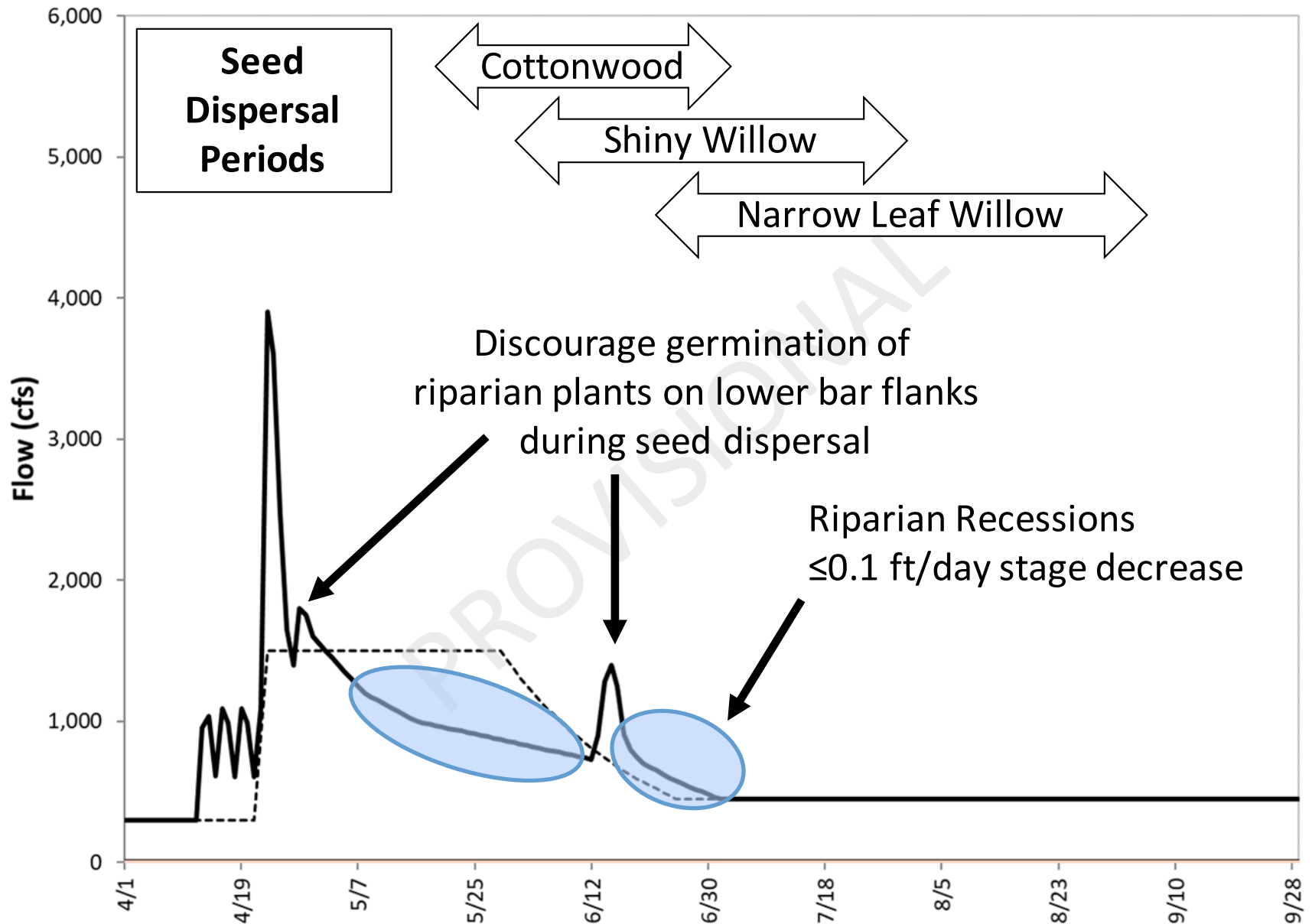
Technical Recommendation: Critically Dry



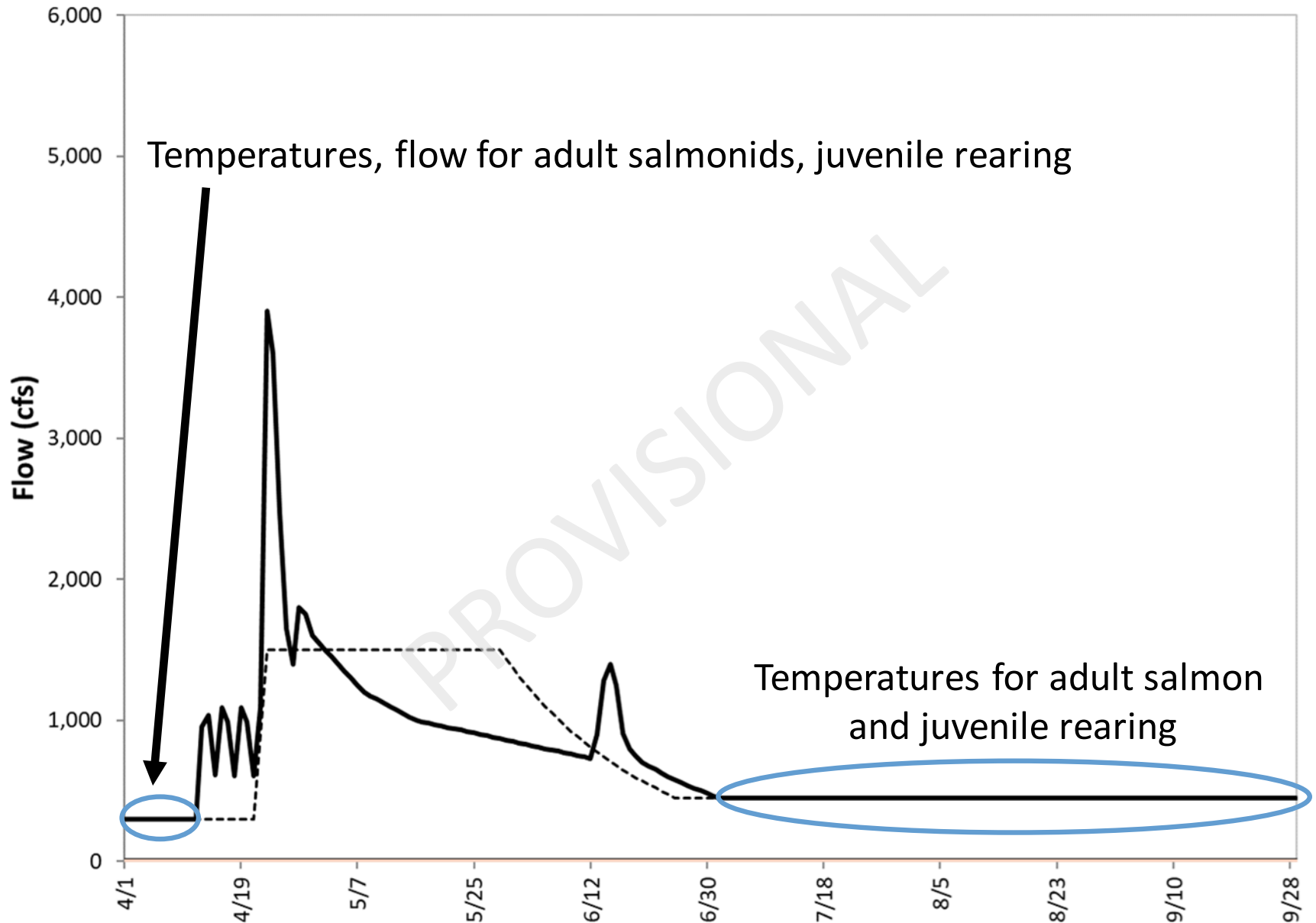
Technical Recommendation: Critically Dry



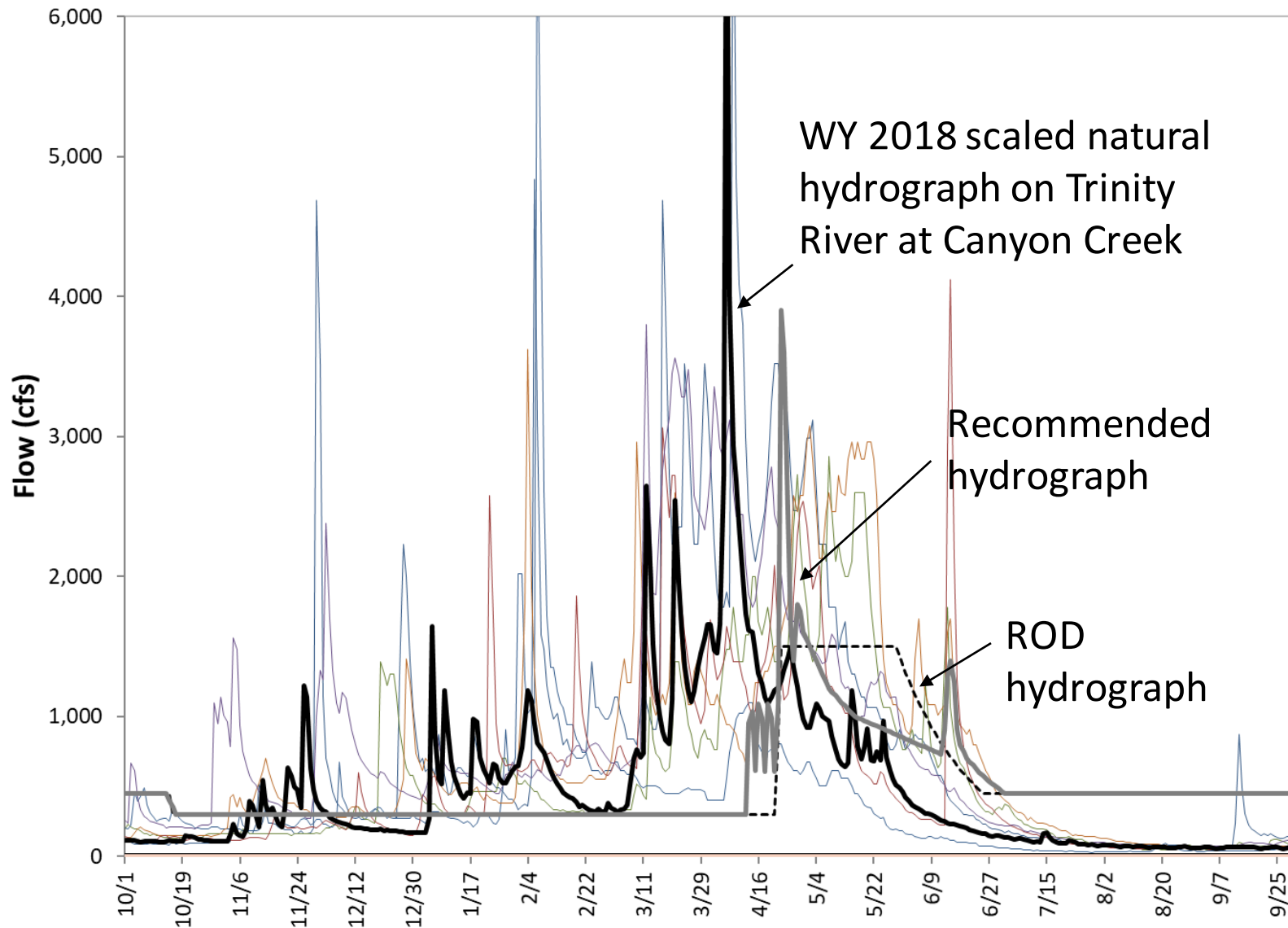
Technical Recommendation: Critically Dry



Technical Recommendation: Critically Dry



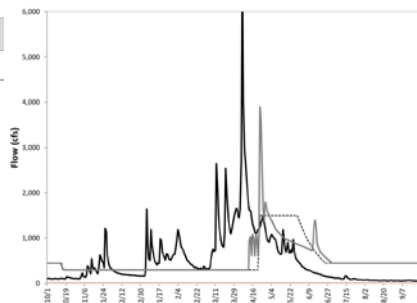
ROD, scaled natural critically dry, and recommended flows at Lewiston

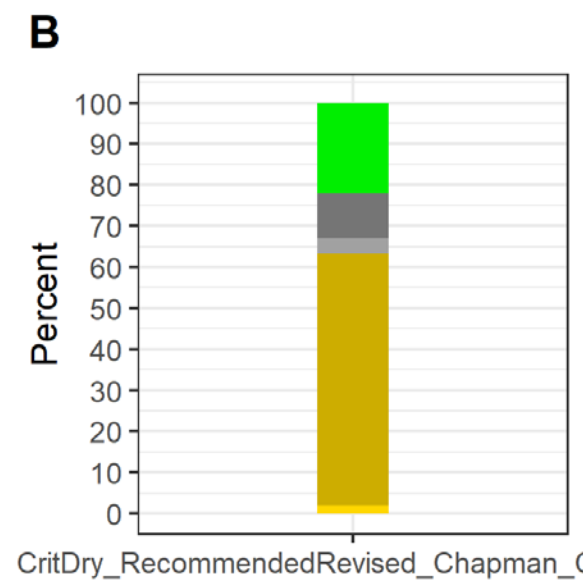
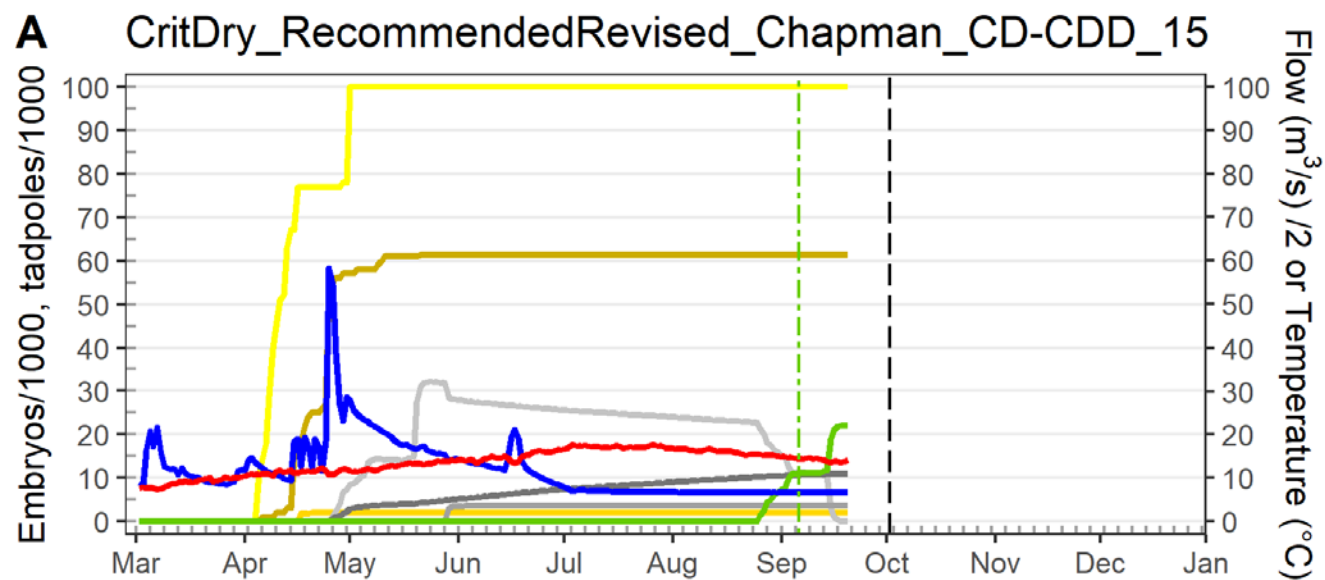


WY 2020 Hydrograph modeling

- Juvenile Chinook production (SSS)
- Temperature and flow accretion (RBM10)
- Bedload transport (rating curve for Douglas City)
- Bed mobility and scour (Shields approach)
- TARGETS (riparian vegetation)
- FYFAM (Foothill yellow-legged frogs)

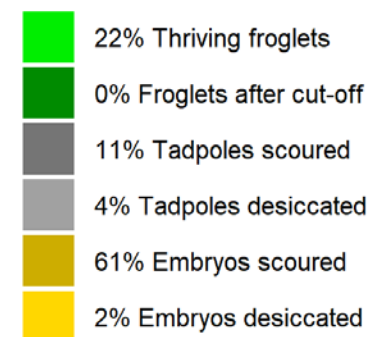
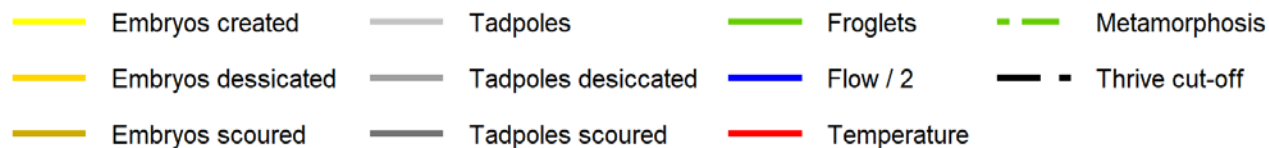
Modeling results for proposed hydrographs		Critically dry WY alternatives		
Parameter		ROD Crit Dry	Recommended Crit Dry	Scaled Natural Crit Dry
Fisheries				
Total Natural Chinook Abundance at Pear Tree (spring and fall run) (SSS)		1,232,844	1,235,545	1,237,757
	Fry abundance (<55 mm)	994,800	996,276	996,268
	Parr abundance (55 - 90 mm)	159,866	158,463	153,453
	Smolt abundance (>90 mm)	78,178	80,806	88,036
Total Natural Chinook Biomass at Pear Tree (metric tons) (SSS)		1.74	1.74	1.80
Temperature				
EIS Temperature objectives for adult salmon holding/spawning at Douglas City (exceedance °C days)				
	Exceedance, average climate conditions (median temperatures)	0	0	95.1
	Exceedance, adverse climate conditions (90% percentile temperatures)	0.5	0.5	220.5
EIS Temperature objectives for adult salmon holding/spawning above NF Trinity River (exceedance °C days)				
	Exceedance, average climate conditions (median temperatures)	0	0	14.7
	Exceedance, adverse climate conditions (90% percentile temperatures)	5.0	5.0	53.3
Temperature Objectives for outmigrating juvenile salmon at Weitchpec (exceedance °C days)				
	Exceedance, average climate conditions (median temperatures)	62.5	78.7	141.7
	Exceedance, adverse climate conditions (90% percentile temperatures)	241.7	268.5	394.7
Temperature objective for juvenile salmonid rearing on Trinity River above NF Trinity River April 1 - July 31 (7 DADA <13°C/>16.5°C; 7 DADA = 7 day average of the daily average temperatures)				
	Exceedance, average climate conditions (median temperatures)	-35.2/0	-39.5/0	-39.5/0
	Exceedance, adverse climate conditions (90% percentile temperatures)	0/0	0/0	-4.9/0
Riparian				
	Black Cottonwood Initiation Potential (nodes)	918	588	924
	Risk of encroachment by narrow leaf willow (peak discharge >6,000 cfs=no risk; <6,000 cfs=risk)	risk	risk	no risk
Biology				
	Number of froglets produced in the modeled reach, % survival	25,955 (26%)	22,098 (22%)	50,559 (51%)
	Median date for FYLF metamorphosis	8/29/2020	9/6/2020	7/22/2020
Physical				
	Total bedload transport at Douglas City (tons)	0	177	602
	Bed surface mobilization (% channel area inundated at 3,000 cfs)	0%	24%	42%
	Deep scour (% channel area inundated at 3,000 cfs)	0%	8%	15%
Administrative				
	Construction Impacts (Days ≥1000 cfs; July 15 to Sept 15)	0	0	0

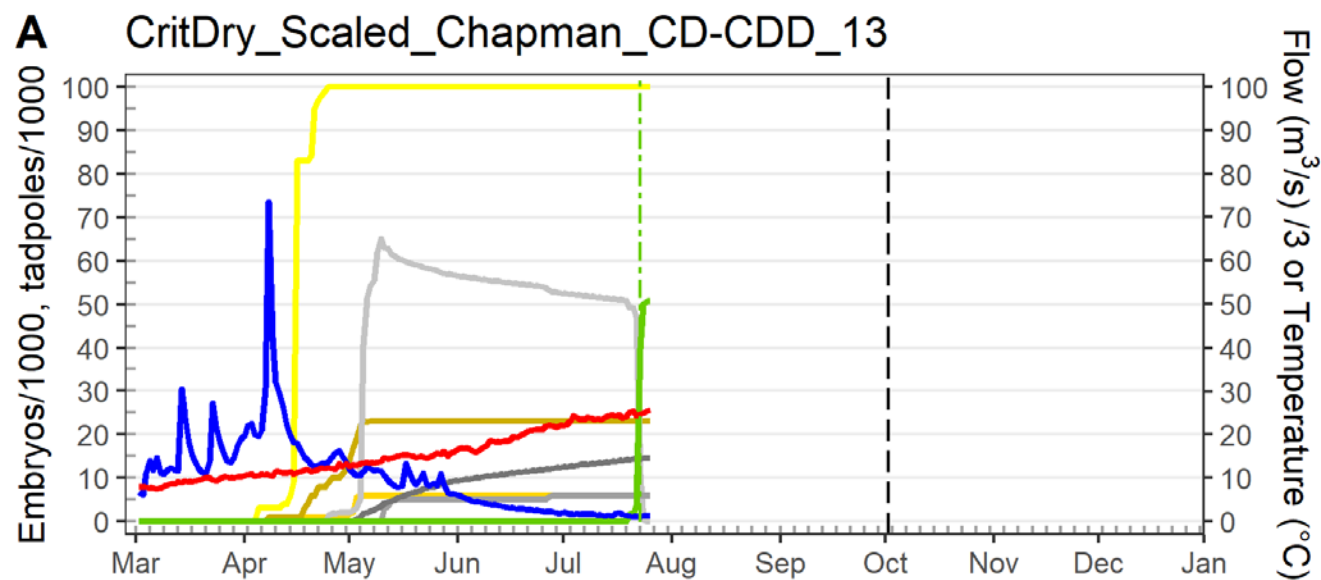




Frogllets produced = 22098 (22%); Median metamorphosis date = 2020-09-05

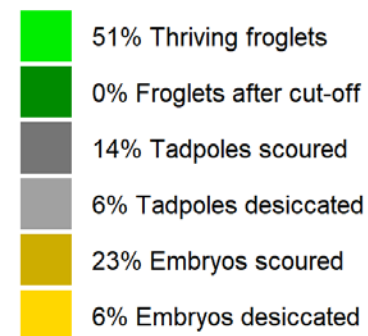
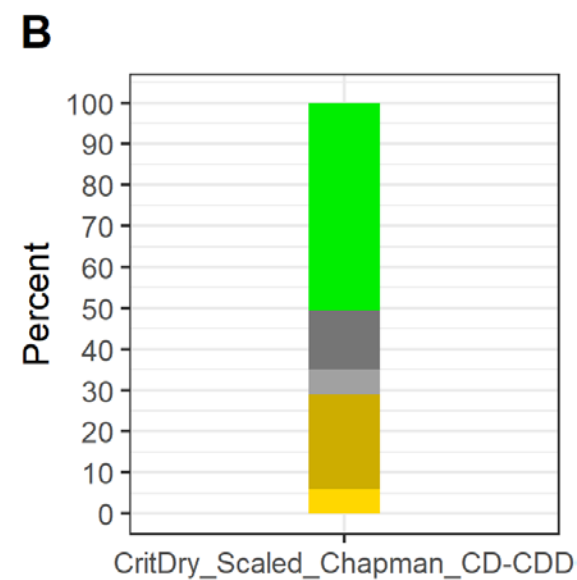
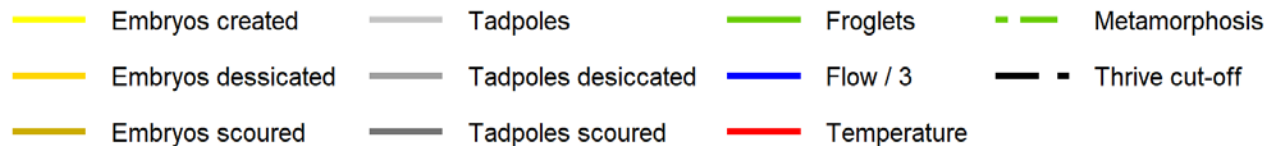
Frogllets produced by 2020-10-01 = 22098 (100% of froglets expected to thrive)





Froglets produced = 50559 (51%); Median metamorphosis date = 2020-07-22

Froglets produced by 2020-10-01 = 50559 (100% of froglets expected to thrive)



Monitoring during spring flow release

Juvenile rearing in off-channel areas

Riparian recruitment of cottonwood and tree willows

Bed load transport with hydrophones

Chinook spawning abundance and distribution

Hydraulic model evaluation at habitat assessment sites

Macroinvertebrate drift

Spring Chinook run size estimate at Junction City

Chinook run size estimate at Willow Creek

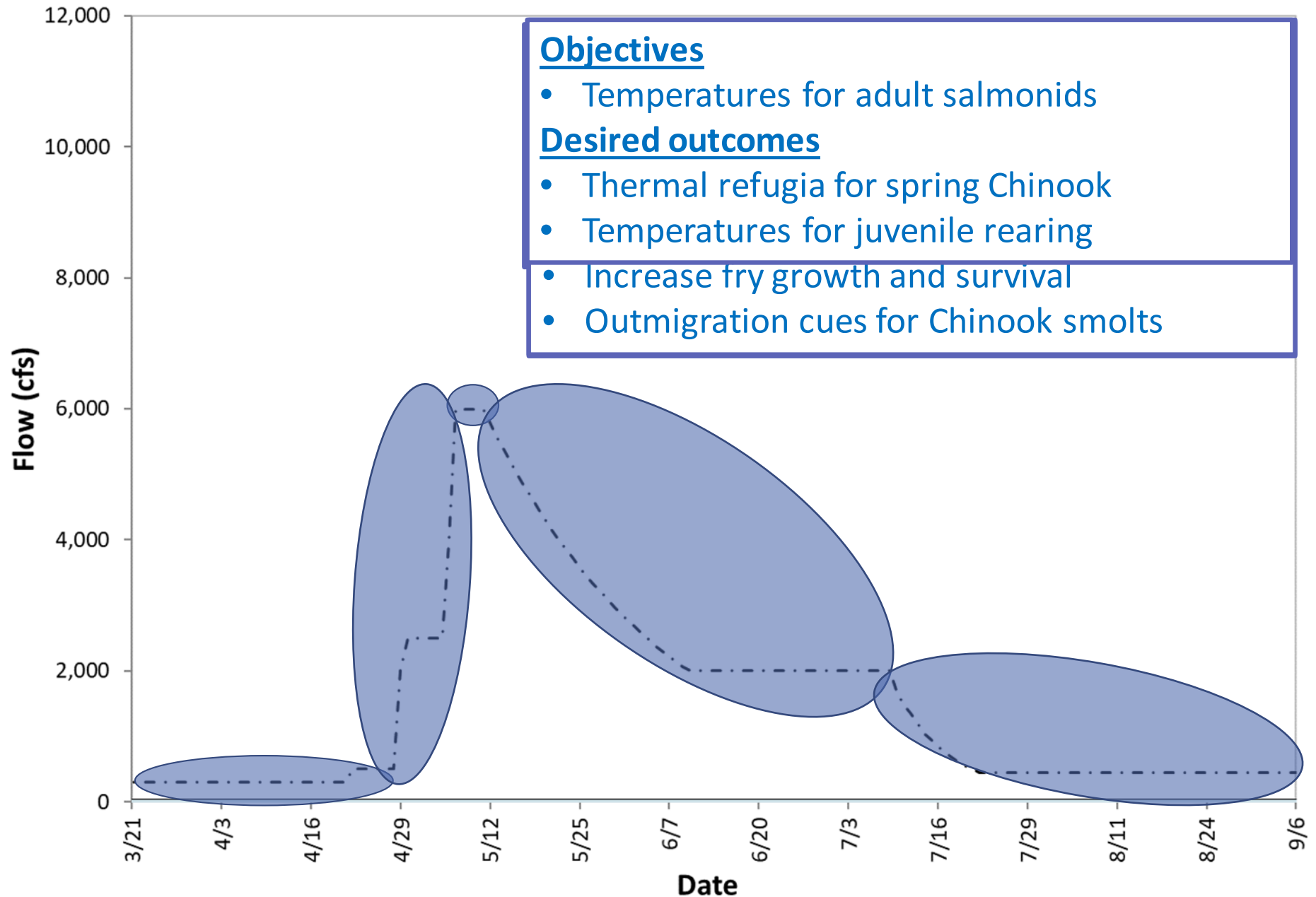
Tribal salmon harvest monitoring

Sport salmon harvest monitoring

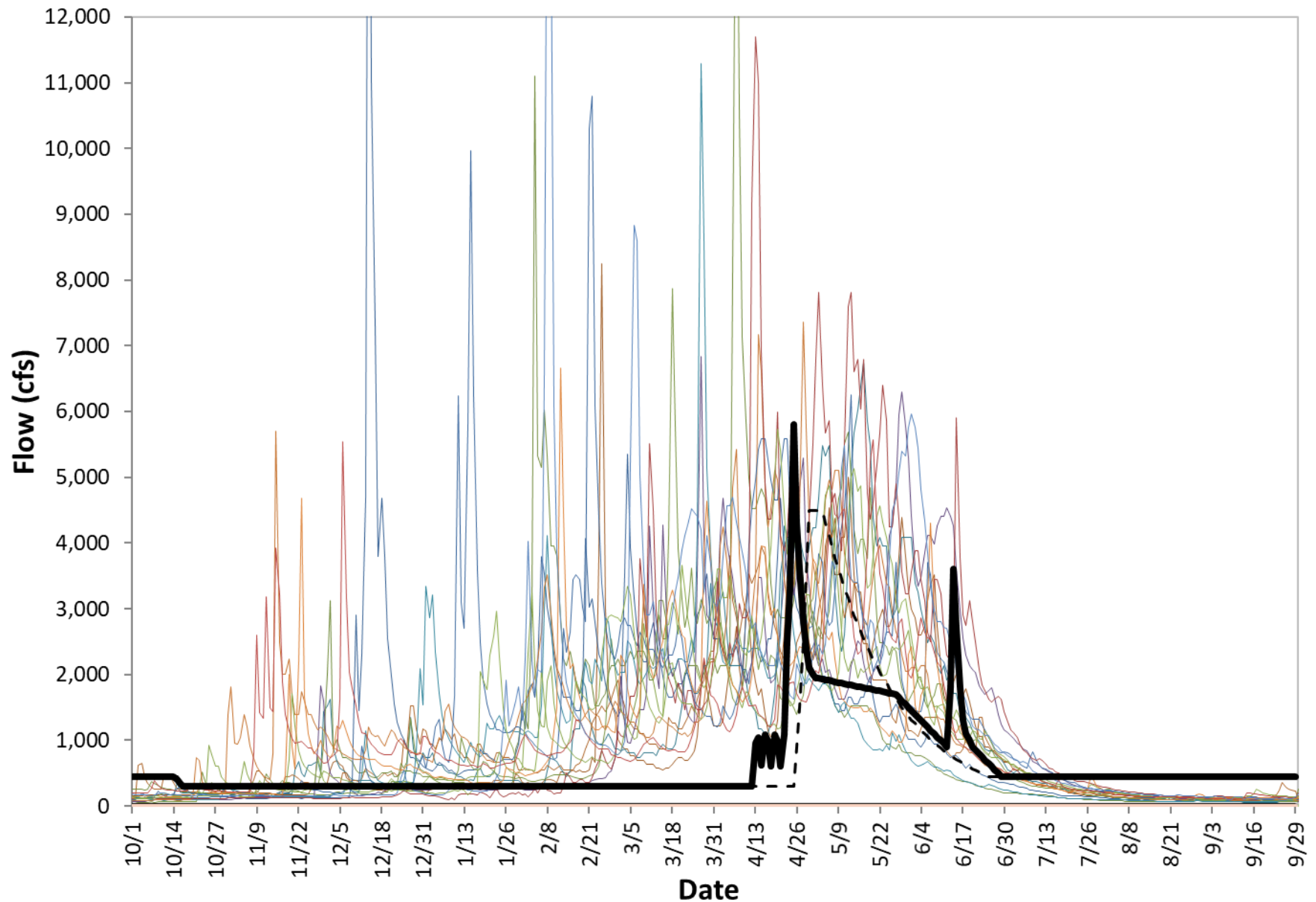
Channel rehabilitation effectiveness monitoring

Juvenile outmigrant monitoring

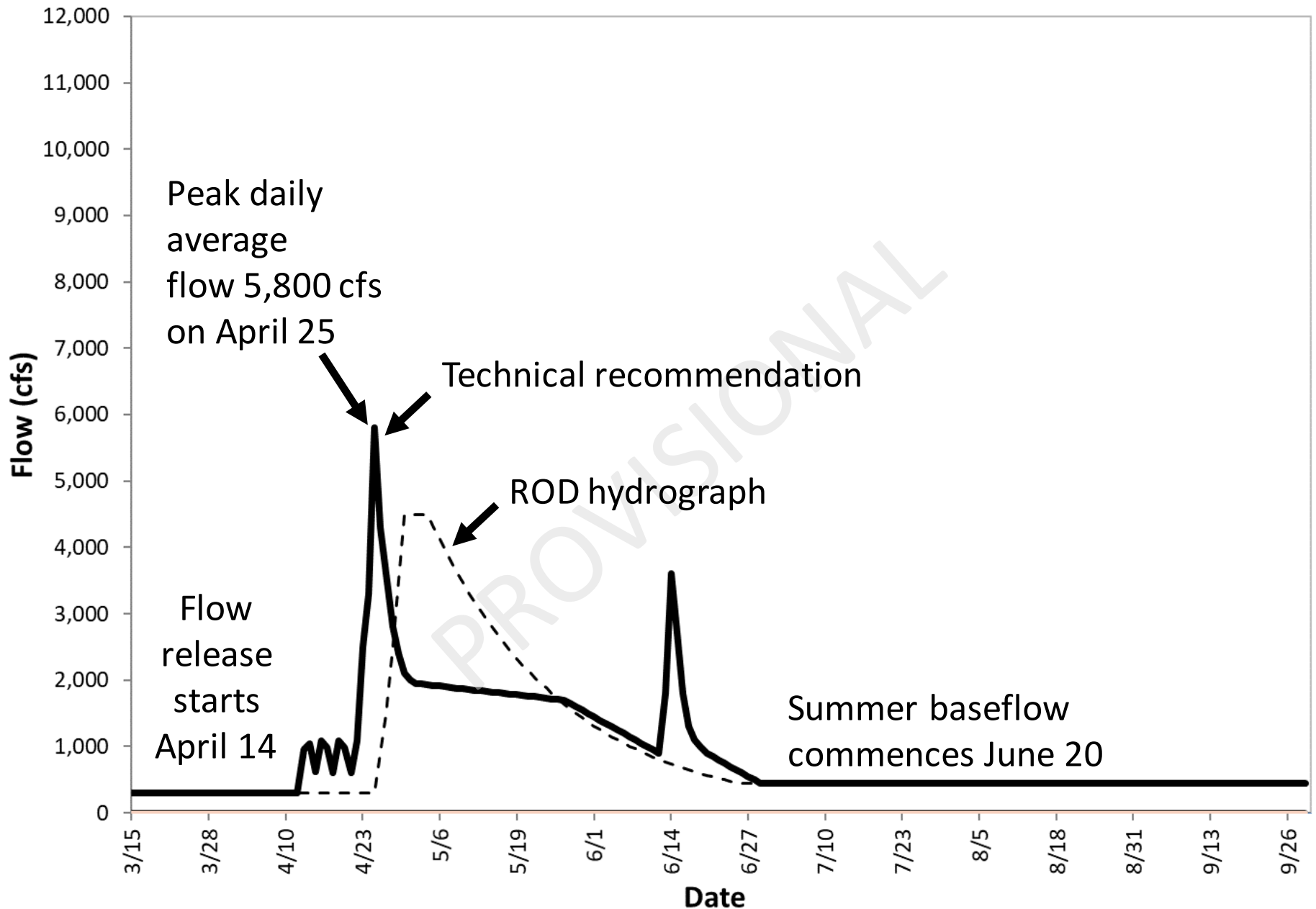
ROD objectives for Dry



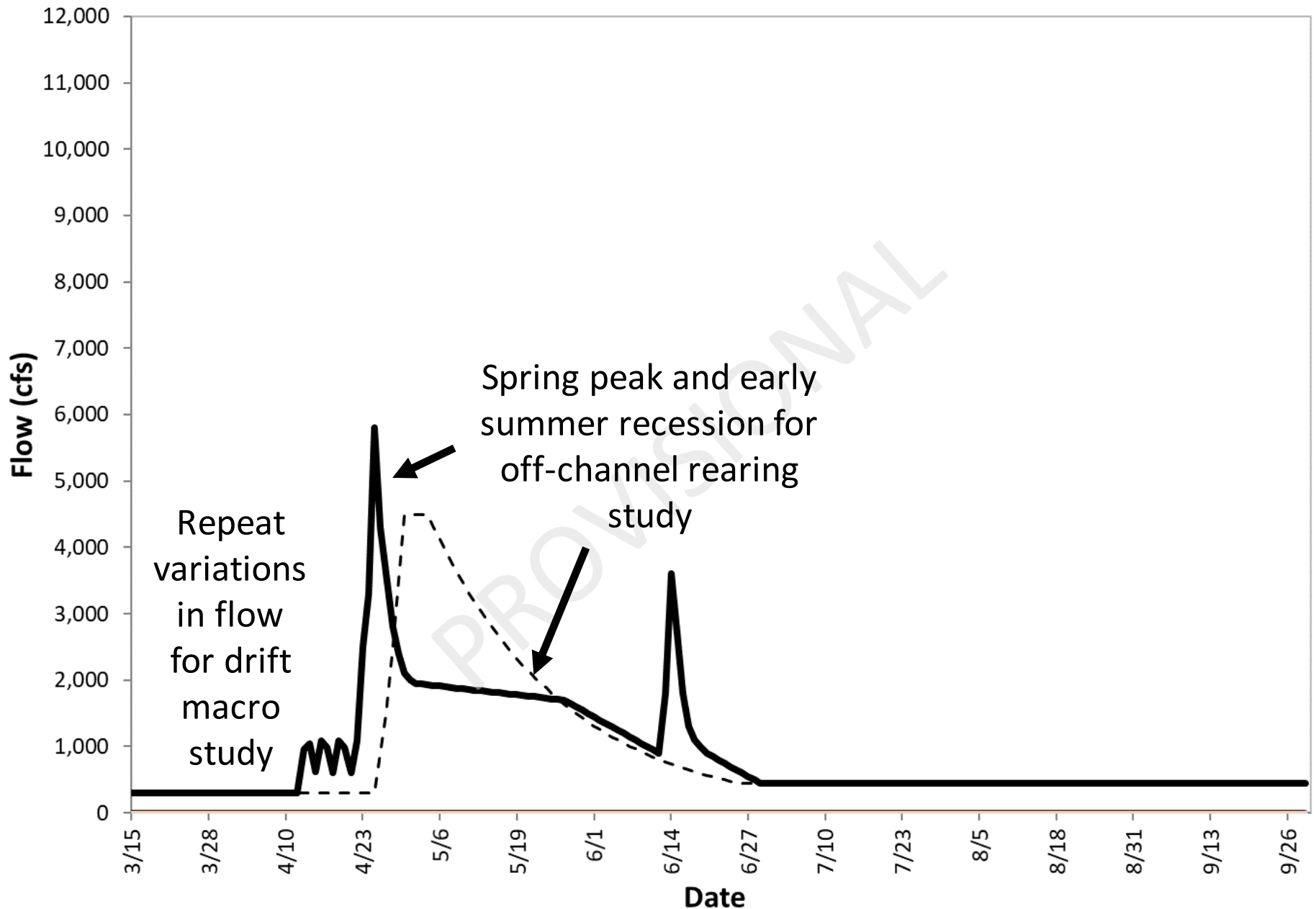
ROD, recommended **Dry** hydrograph and pre-dam flows at Lewiston



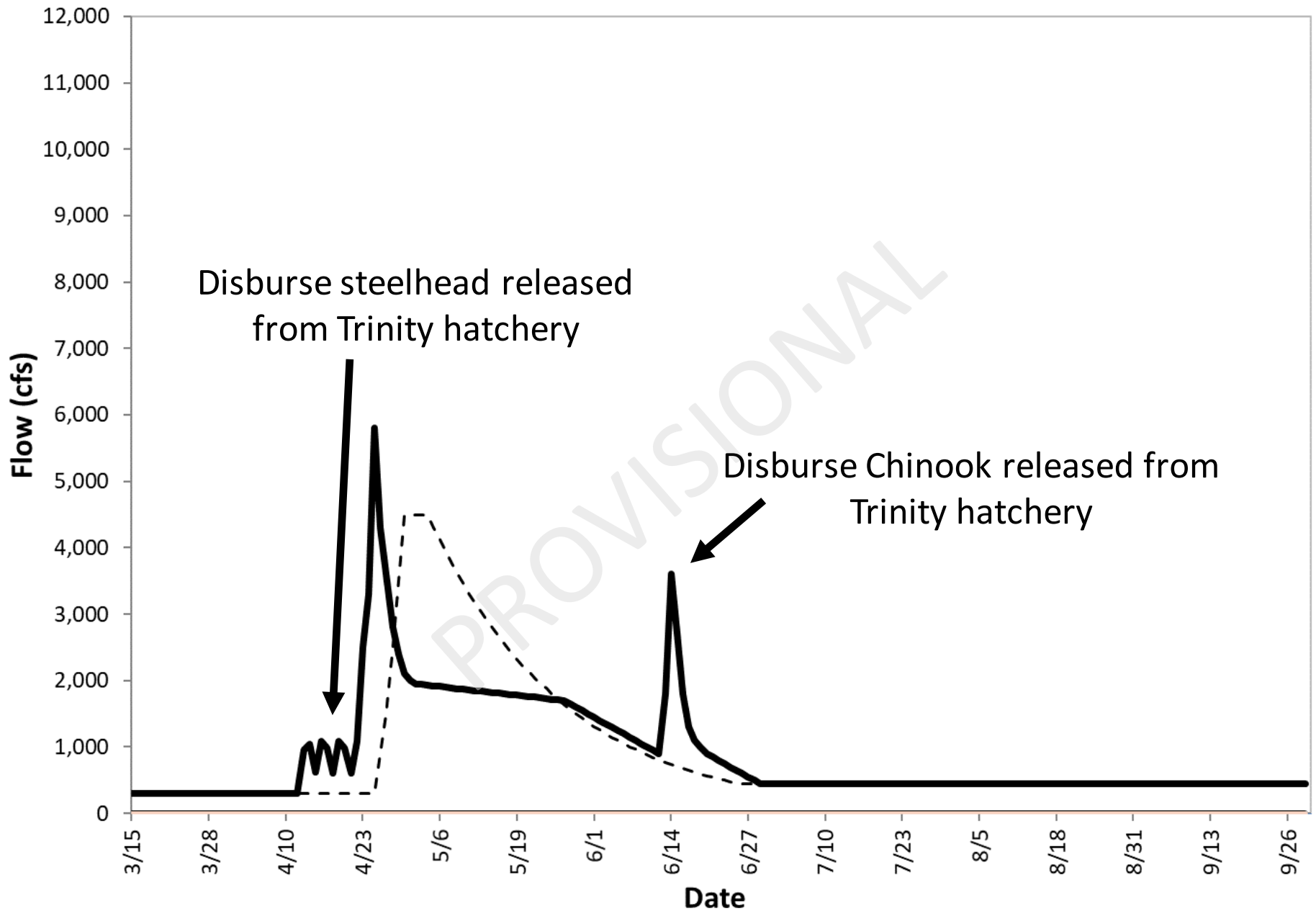
Technical Recommendation: Dry



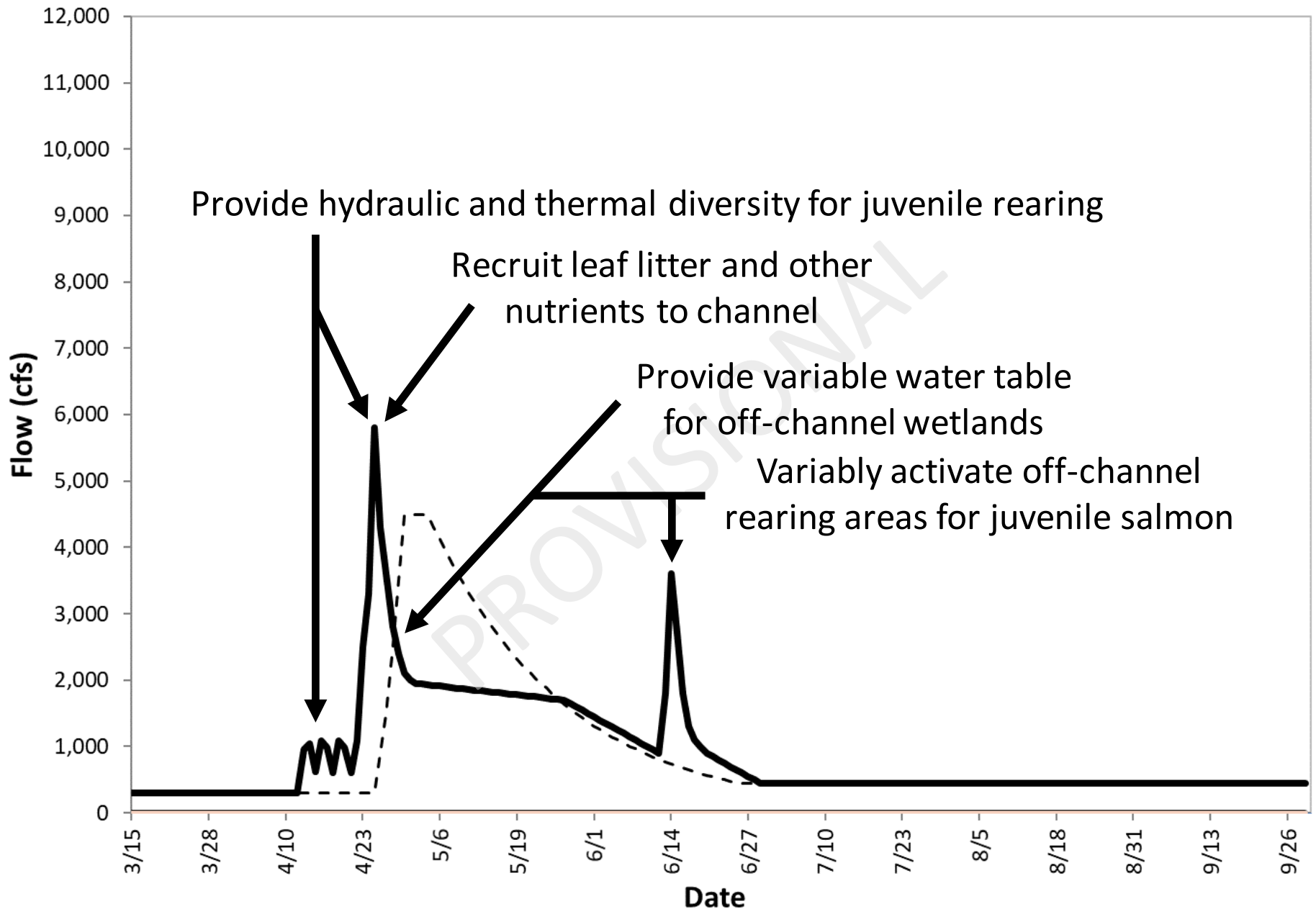
Technical Recommendation: Dry



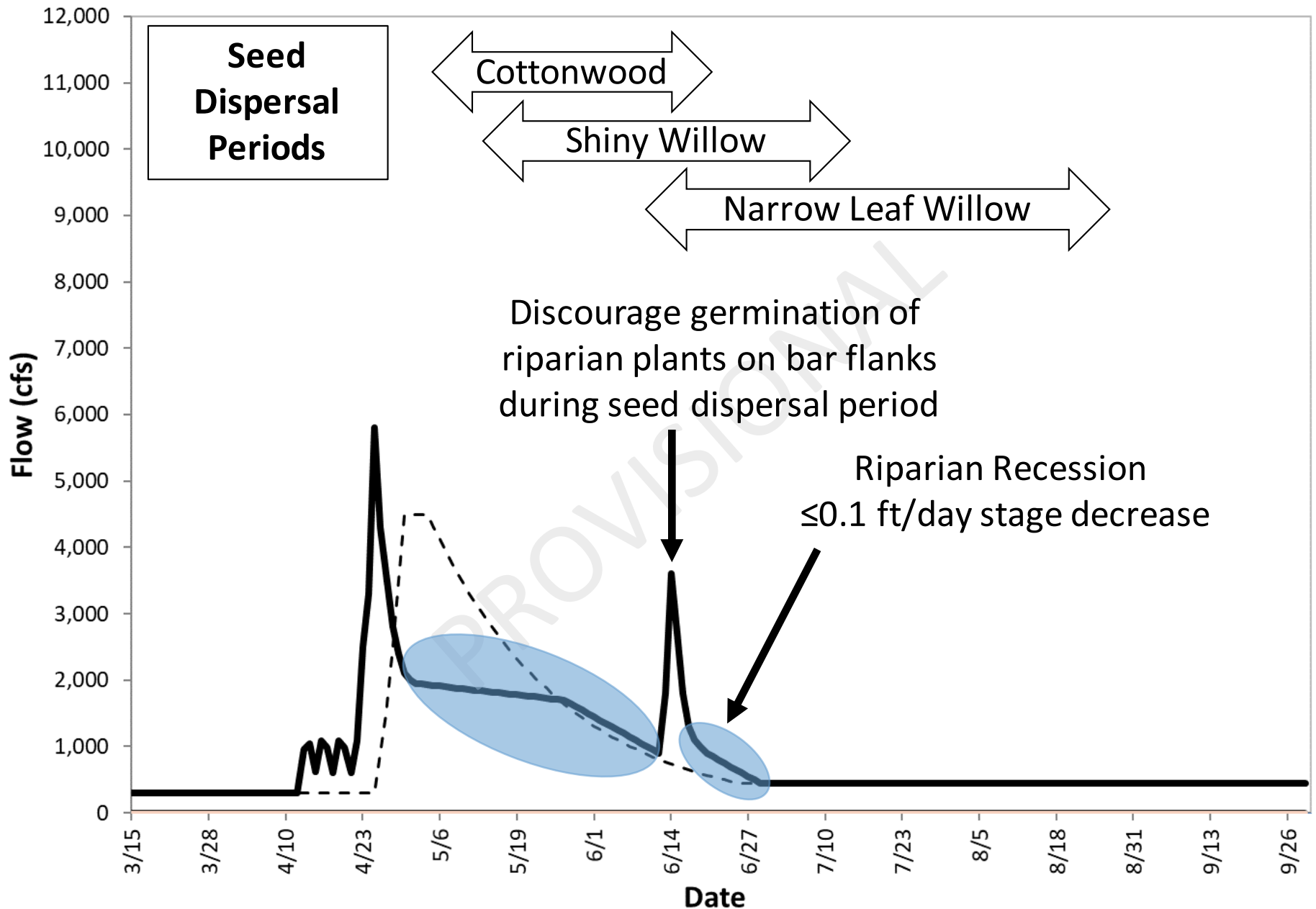
Technical Recommendation: **Dry**



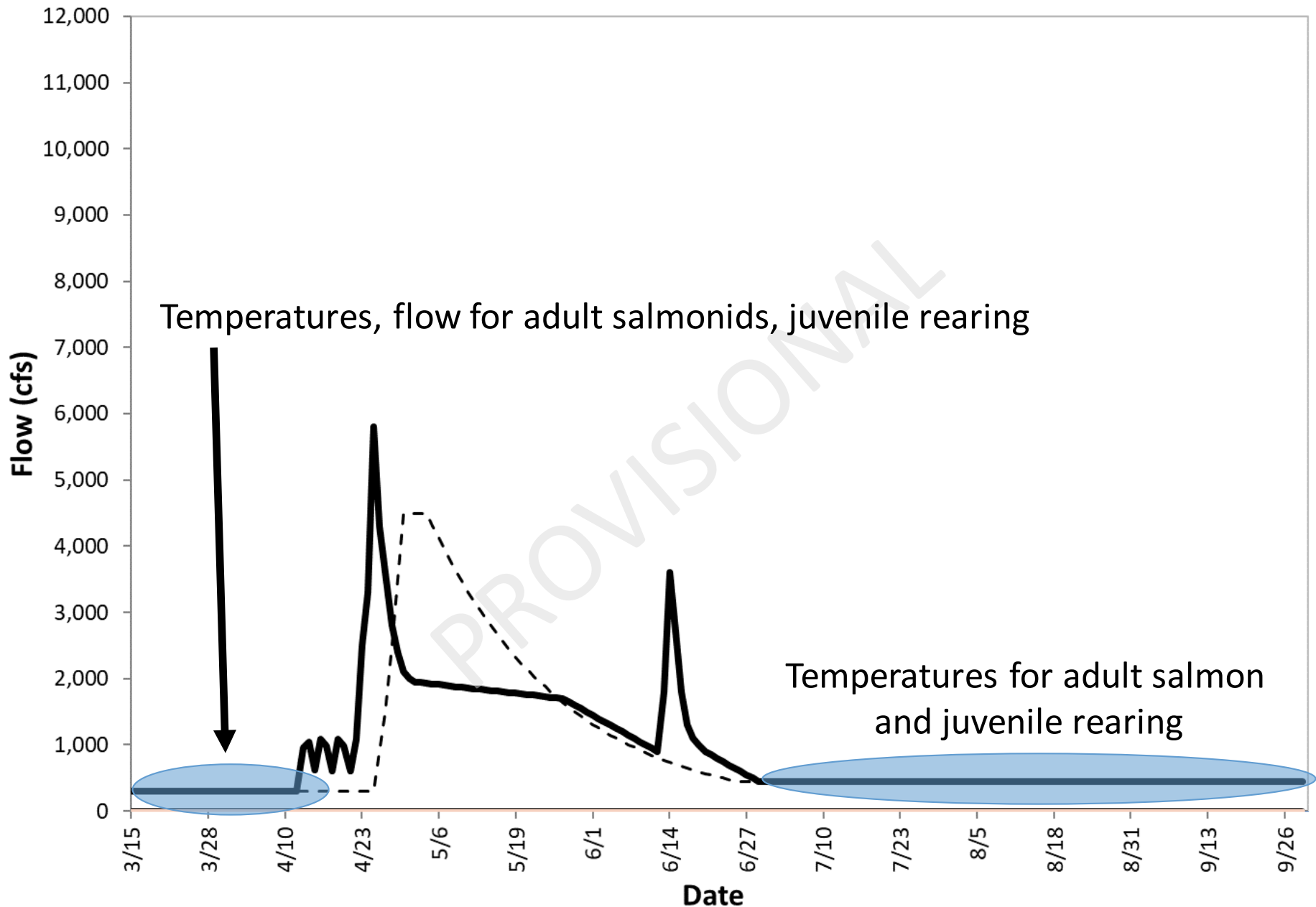
Technical Recommendation: Dry



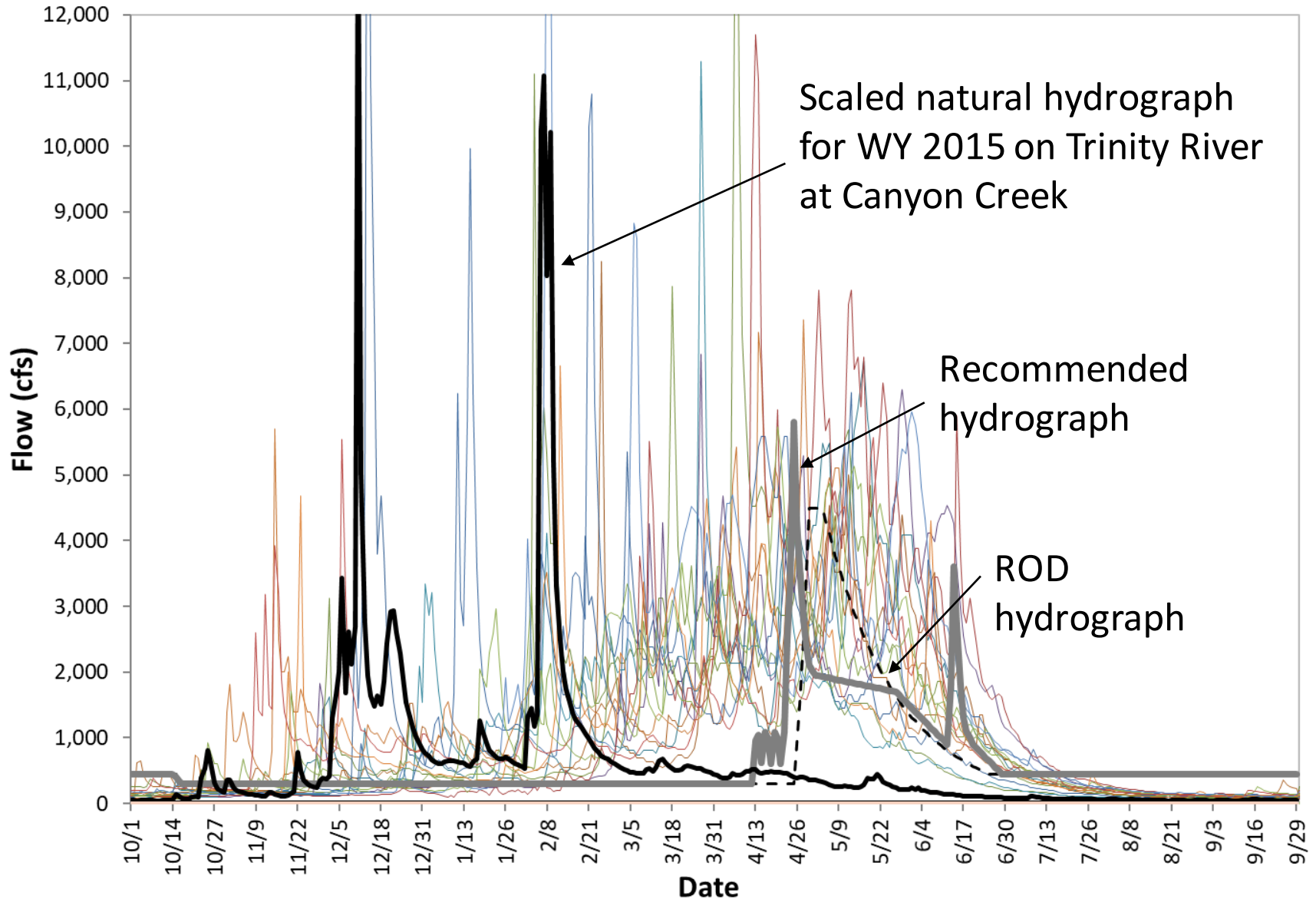
Technical Recommendation: Dry



Technical Recommendation: Dry

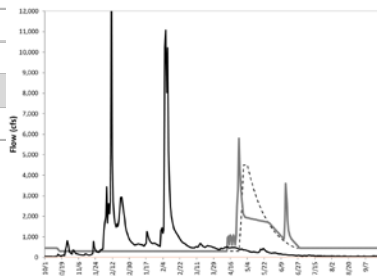


ROD, alternate **Dry** hydrograph and pre-dam flows at Lewiston



Modeling results for proposed hydrographs

		Dry WY alternatives		
Parameter		ROD Dry	Recommended Dry	Scaled Natural Dry
Fisheries				
Total Natural Chinook Abundance at Pear Tree (spring and fall run) (SSS)		1,200,803	1,204,000	1,041,700
	Fry abundance (<55 mm)	1,009,623	1,012,784	805,363
	Parr abundance (55 - 90 mm)	158,234	159,643	130,873
	Smolt abundance (>90 mm)	32,946	31,573	105,464
Total Natural Chinook Biomass at Pear Tree (metric tons) (SSS)		1.28	1.27	1.72
Temperature				
EIS Temperature objectives for adult salmon holding/spawning at Douglas City (exceedance °C days)				
	Exceedance, average climate conditions (median temperatures)	0	0	150.1
	Exceedance, adverse climate conditions (90% percentile temperatures)	0.5	0.5	282.7
EIS Temperature objectives for adult salmon holding/spawning above NF Trinity River (exceedance °C days)				
	Exceedance, average climate conditions (median temperatures)	0	0	31.3
	Exceedance, adverse climate conditions (90% percentile temperatures)	5.0	5.0	82.5
Temperature Objectives for outmigrating juvenile salmon at Weitchpec (exceedance °C days)				
	Exceedance, average climate conditions (median temperatures)	53.9	52.6	174.8
	Exceedance, adverse climate conditions (90% percentile temperatures)	206.3	189.2	463.8
Temperature objective for juvenile salmonid rearing on Trinity River above NF Trinity River April 1 - July 31 (7 DADA <13°C/>16.5°C; 7 DADA = 7 day average of the daily average temperature)				
	Exceedance, average climate conditions (median temperatures)	-55.1/0	-50.3/0	-25.8/0
	Exceedance, adverse climate conditions (90% percentile temperatures)	0/0	0/0	0/0
Riparian				
	Black Cottonwood Initiation Potential (nodes)	1,992	405	1,095
	Risk of encroachment by narrow leaf willow (peak discharge >6,000 cfs=no risk; <6,000 cfs=risk)	risk	risk	no risk
Biology				
	Number of froglets produced in the modeled reach, % survival	20,537 (21%)	17,599 (18%)	63,331 (63%)
	Median date for FYLF metamorphosis	8/28/2020	9/20/2020	7/19/2020
Physical				
	Total bedload transport at Douglas City (tons)	1,545	1,898	6,566
	Bed surface mobilization (% channel area inundated at 3,000 cfs)	28%	36%	52%
	Deep scour (% channel area inundated at 3,000 cfs)	8%	11%	25%
Administrative				
	Construction Impacts (Days ≥1000 cfs; July 15 to Sept 15)	0	0	0



Questions?

