Modeling of Dworshak Summer 2004 Operations

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Columbia River Inter-Tribal Fish Commission

Introduction

- Goal: Model Dworshak flows and elevations from summer operation proposals. Evaluate impacts on elevation, water temperature, recreation, refill.
- GENESYS Hydro model: multi-year impacts on spring refill, lake levels, etc.
- CRITFC's Hydro spreadsheet: outflows & elevations. Inflows are given by NOAA's River Forecast Center.
- EPA's RBM-10 model: water temperature. Assumes 1979, 1991, and 1994 composite meteorology, 2000 Dworshak and Brownlee water temperatures, and 1988 tributary inflows.

Weather Assumptions

Lewiston air temperature	MAY	JUN	JUL	AUG	SEP
1979	59.15	67.12	76	74.95	68.95
Departure	1.0	1.5	2.3	3.1	5.5
1991	55.85	60.28	72.27	75.08	65.53
Departure	-2.8	-6.6	-1.8	1.5	1.6
1994	61.53	66	77.76	75.15	67.42
Departure	2.9	-0.8	3.7	1.5	3.5
average:	**0.4**	**-2.0**	**1.4**	**2.0**	**3.5**
	MAY	JUN	JUL	AUG	SEP
2004 departure	0	-1			
	Assumption: "PDO-warm / ENSO-neutral"				
OCT 2003 - MAY 2004:	PDO = 0.58 (+/- 0.18)			MEI = 0.34 (+/- 0.19)	

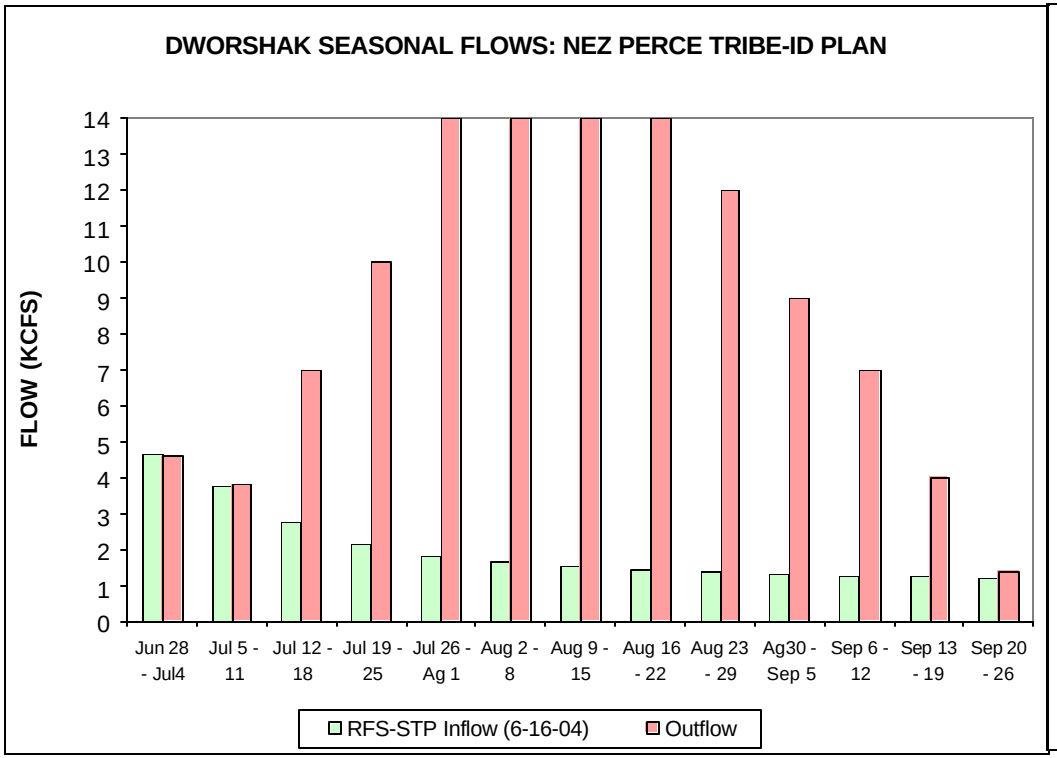
Highlights of Proposals

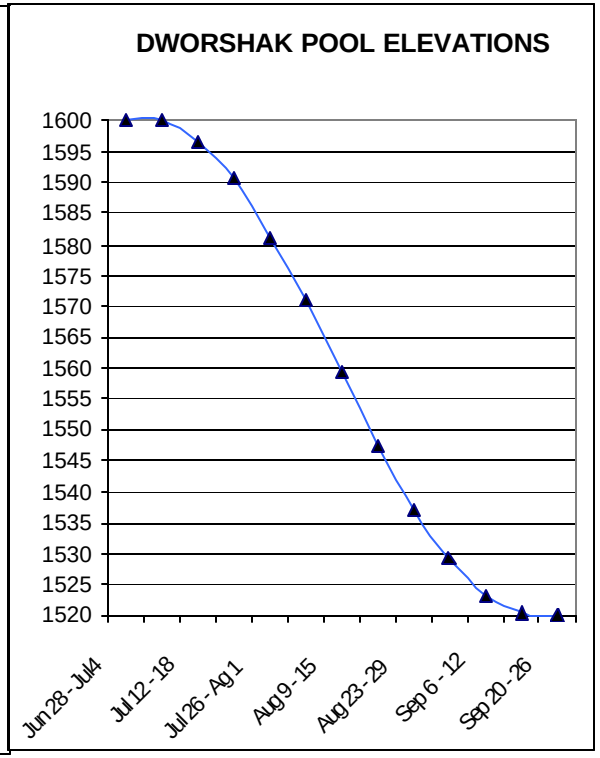
- Nez Perce Tribe - Idaho (NPT-ID) Plan.
- TMT-2003 Plan.
- 2000 Biological Opinion Plan.

GENESYS Modeling Results

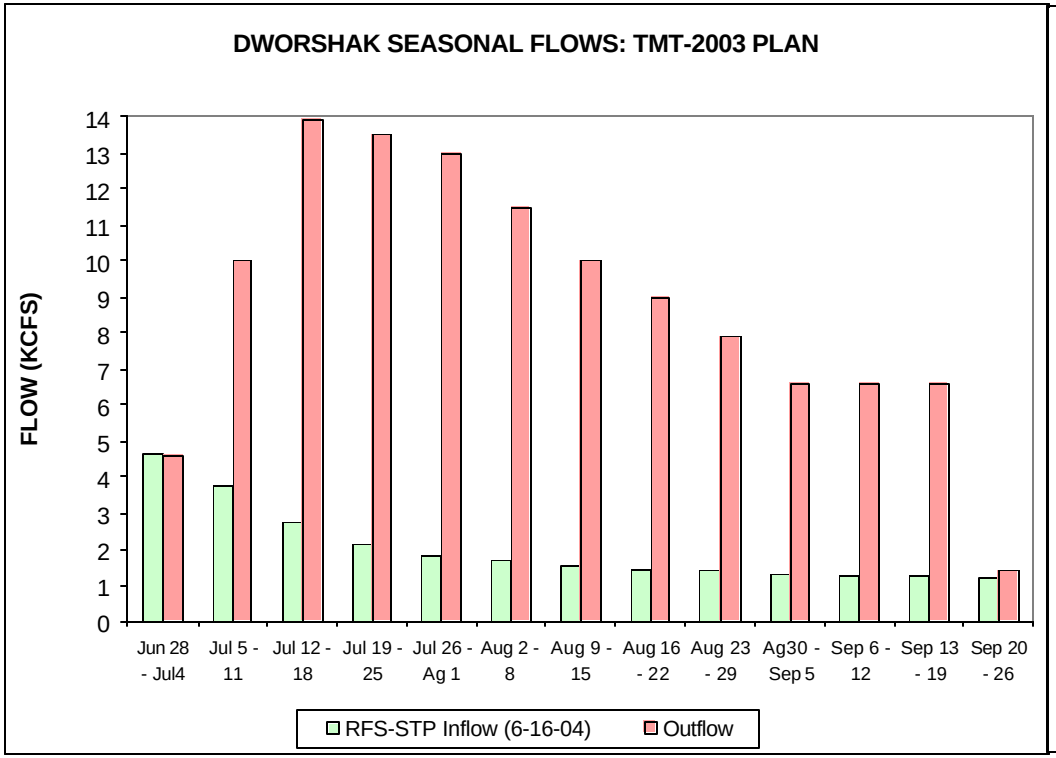
MODEL RESULTS (average of Water Years 1929 through 1978)			
DWR Outflows (cfs):	NPT-ID	TMT-2003	Biological Opinion
July	8360	12070	14000
August 1-15	13800	11200	13850
August 16-31	12350	8450	7700
September	4600	4150	1300
DWR Elevations (feet):	NPT-ID	TMT-2003	Biological Opinion
31-Jul	1582	1568	1560
15-Aug	1559.4	1549	1535
31-Aug	1535	1533	1520
30-Sep	1520	1520	1520
June refill misses:	NPT-ID	TMT-2003	Biological Opinion
(> 1599 feet)	13	13	13
(> 1595 feet)	10	10	10

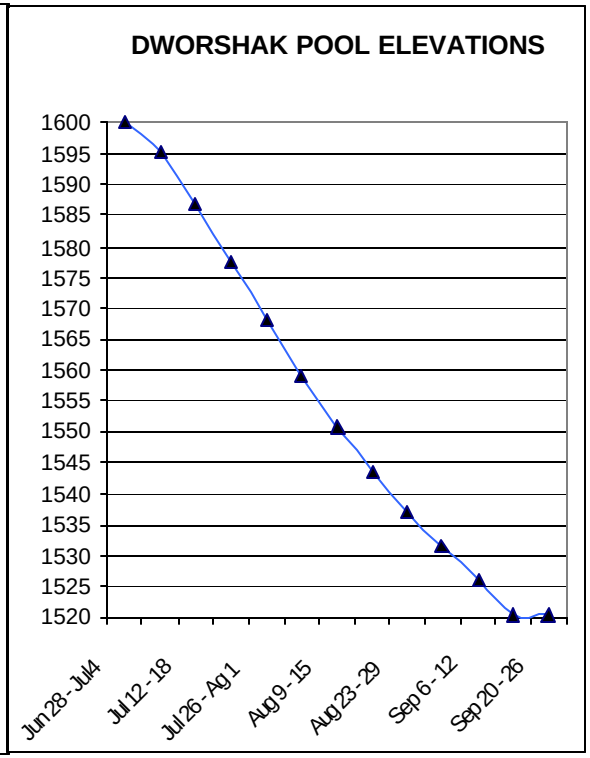
NPT-Idaho Plan



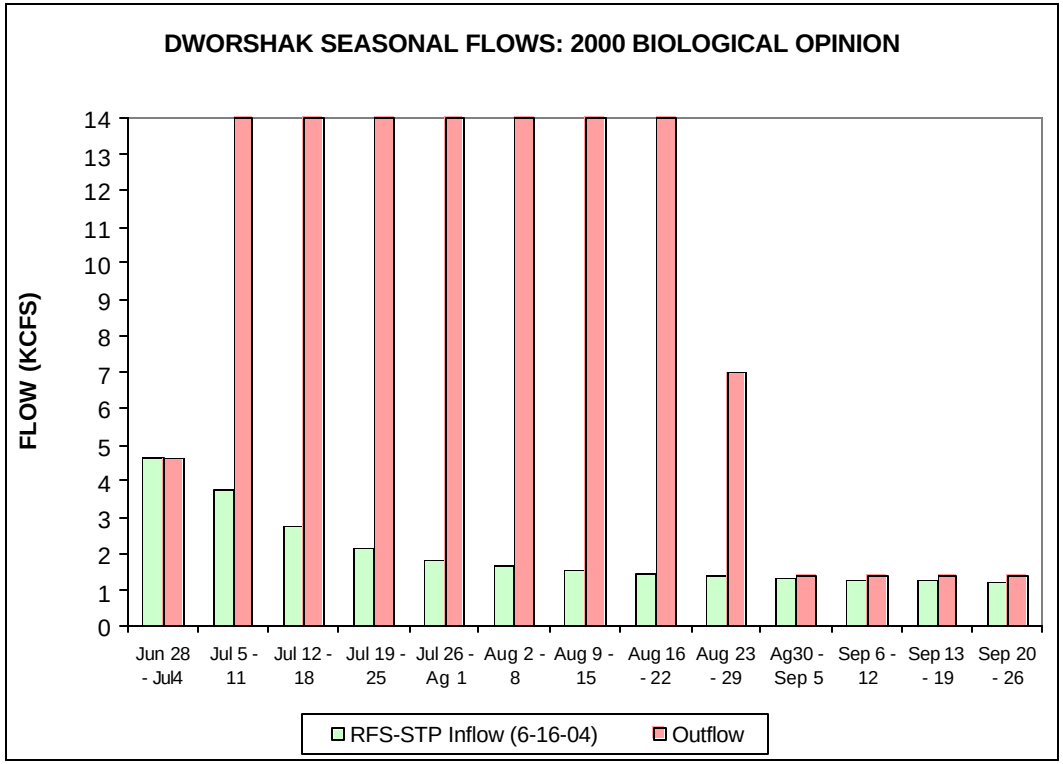


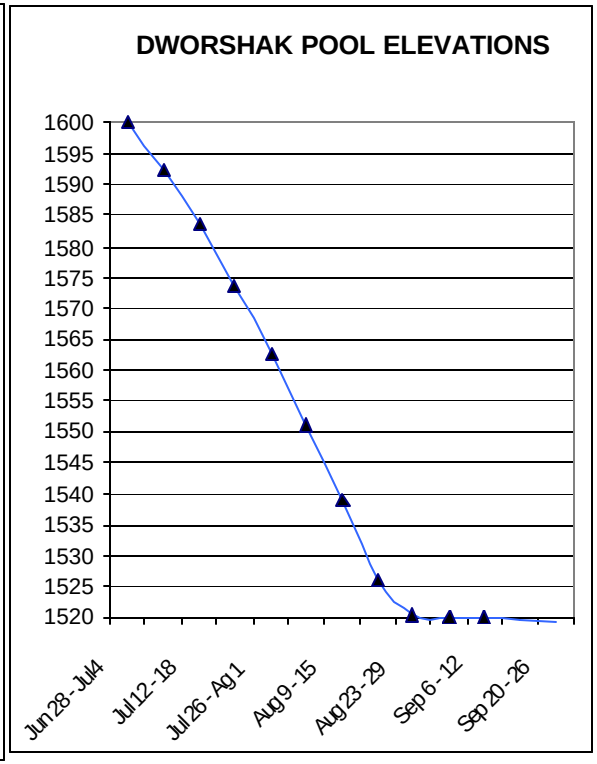
TMT-2003 Plan





Biological Opinion Plan



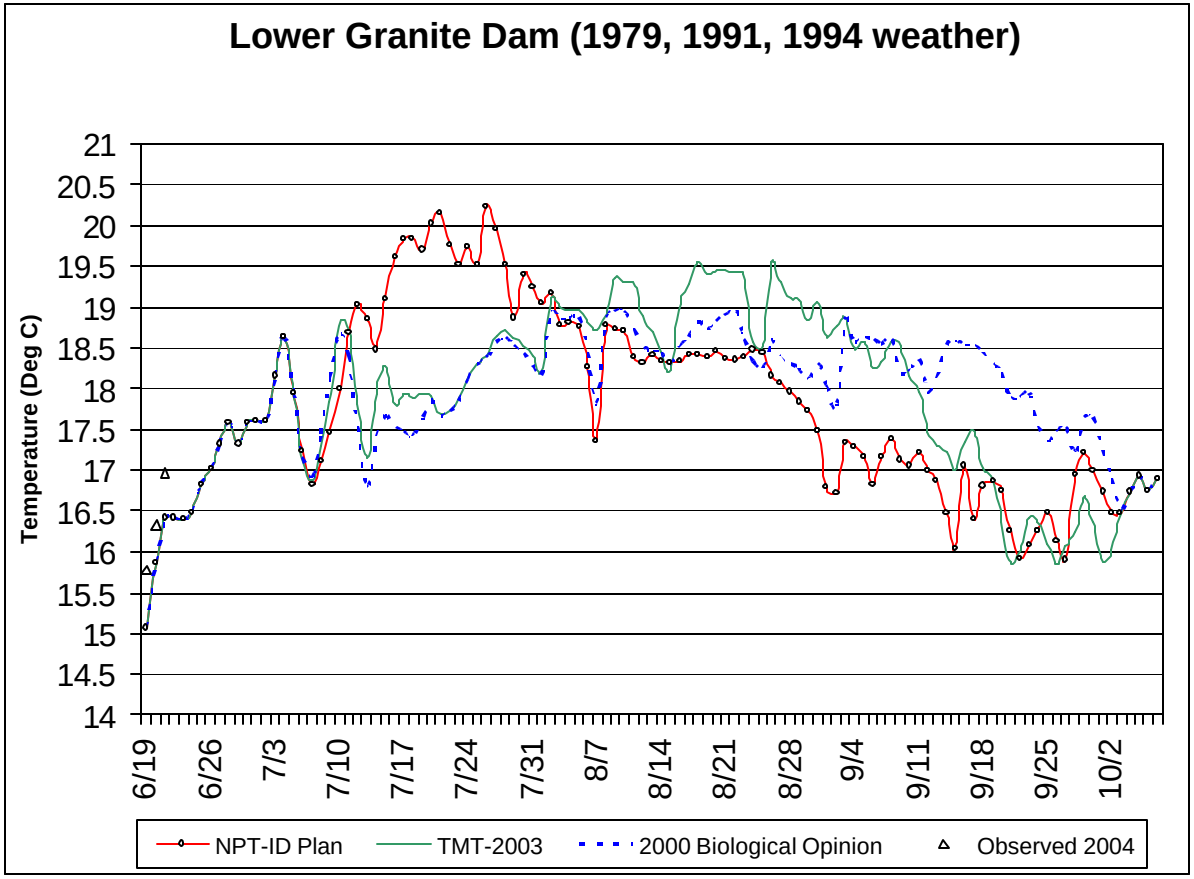


CRITFC Modeling Results

CURRENT (June 16, 2004) CRITFC MODEL FORECAST RESULTS			
Dworshak Outflows (cfs):	NPT-Idaho	TMT-2003	Biological Opinion
July 1-15	4900	9600	11500
July 16-31	10900	13400	14000
August 1-15	14000	10900	14000
August 16-31	12500	8200	9350
September	5100	5200	1400
SEP DWR Augmentation (KaF):	200	200	0
Lower Granite Outflows (cfs):	NPT-Idaho	TMT-2003	Biological Opinion
July 1-15	35000	39600	41500
July 16-31	35400	37900	38500
August 1-15	39400	36300	39400
August 16-31	32800	28700	29800
September	21600	21700	17900
Dworshak at 1570 ft:	8-Aug	30-Jul	27-Jul
EPA: Days > 20 degC at LWG:	NPT-Idaho	TMT-2003	Biological Opinion
July	2	0	0
August 1-15	0	0	0
August 16-31	0	0	0
September	0	0	0

Water Temperature

(Courtesy of Ben Cope, EPA-Seattle)



Conclusions

- Biological Opinion Plan: drafts in July will lower lake levels at the fastest rate. High outflows in early July will slow juvenile salmon growth. Benefits lower Snake flows in July. Impacts late migrating Clearwater stocks and adults.
- TMT-2003 Plan: drafts in July will lower lake levels, but not as fast. Sharp rise in mid-July flows is followed by a step-wise reduction. September has a 200 KaF carryover from summer flows, as prescribed in the NPT-ID Plan.
- Nez Perce Tribe-Idaho Plan: better timed outflows benefit juvenile <u>and</u> adult salmon while providing cooler water for lower Snake through Sept. Lake levels stay higher, longer.