

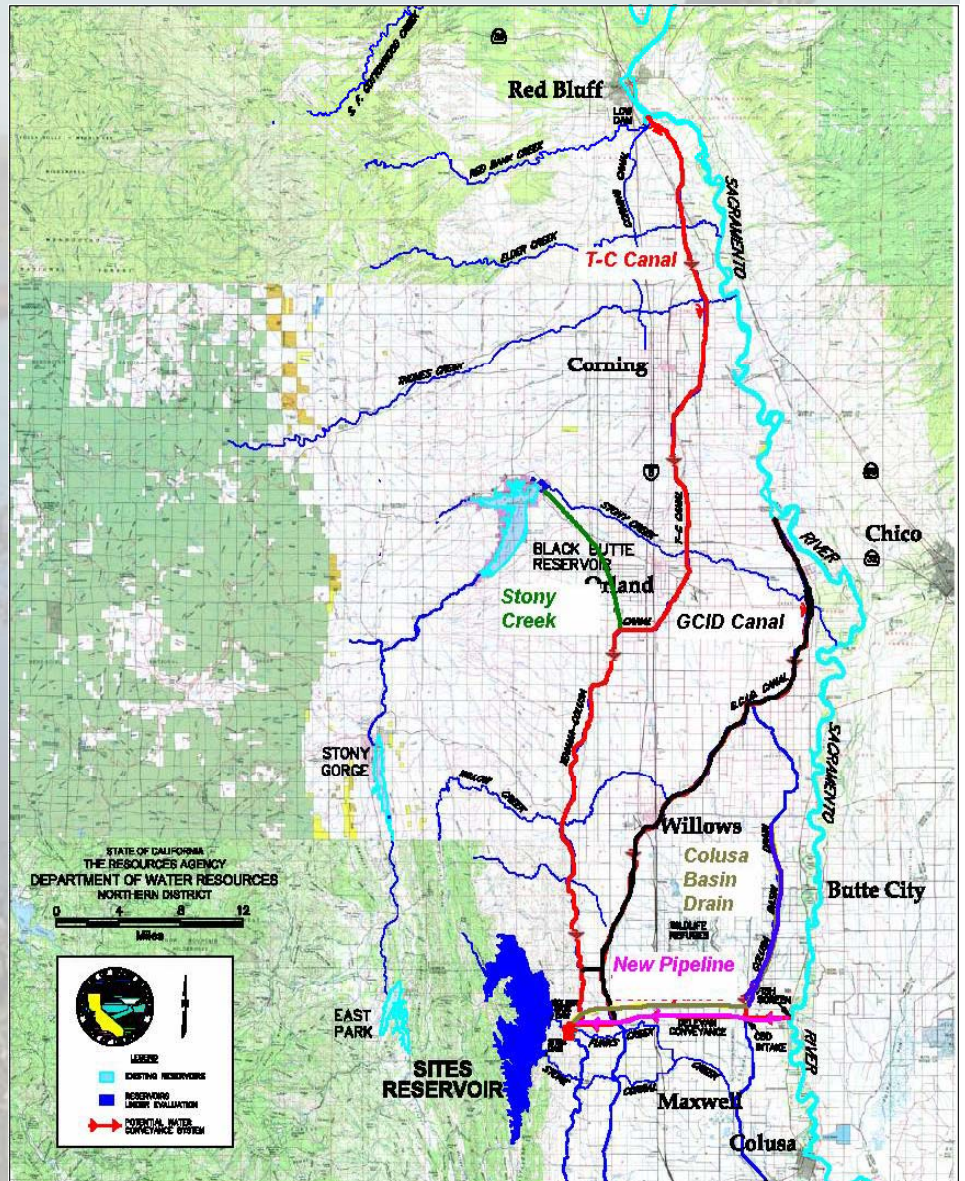
Ecological Flows Tool for the Sacramento River and Delta



Better ecological information is needed to ensure the best possible design of future water projects

A number of potential water development projects on the horizon:

- Sites off-stream storage reservoir (NODOS)
- Raising Shasta Dam
- BiOps & OCAP
- Delta Vision and the Bay-Delta Conservation Plan (BDCP)



What EFT adds to water operations planning



1. Allows comparison of effects on multiple ecological targets
2. Enables this comparison amongst alternative water management projects
3. Allows comparison of different management actions
4. Provides a range of outputs from simple to complex for the above comparisons
5. Develop ecological flow regime recommendations

EFT vision



Make it easy to expand the ecological considerations & science foundation used to evaluate water management alternatives for the Sacramento River.

Phase I



How is SacEFT different, what does it add?



Currently

Few ecosystem components:

- temperature,
- salinity,
- in-stream flows,
- salmon,
- temperature control points

SacEFT

- 6 species over 150+ river miles
 - Chinook salmon
 - Steelhead
 - Green sturgeon
 - Bank swallows
 - Western pond turtle
 - Cottonwoods
- Biophysical “plug-in” for *existing* planning models (CalSim II Daily Operations, USBR-TMS) & new physical models (TUGS, Meander Migration)
- Managed complexity
 - *Communicate* flow scenario outcomes to managers
 - Developing broader, clearer ecological targets

SacEFT Technical Input

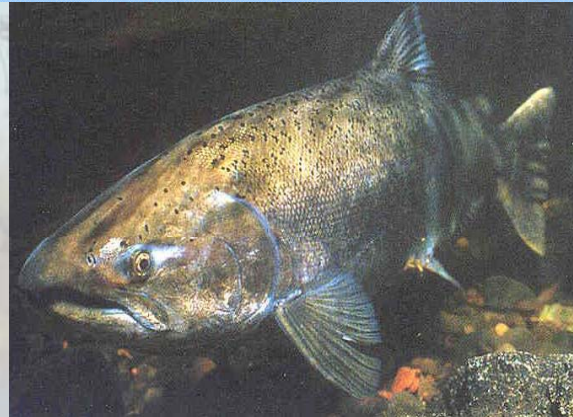


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	Michael Singer, UCSB	Nadav Nur, PRBO	
	Ken Kirby	Nat Seavy, PRBO	
	Tom Smith, Ayres Associates	Chrissy Howell, PRBO	
	Dave Vogel		

SacEFT focal species



Steelhead
(*Oncorhynchus mykiss*)



Chinook Salmon
(*Oncorhynchus tshawytscha*)



Green Sturgeon
(*Acipenser medirostris*)



Bank Swallow
(*Riparia riparia*)



Western Pond Turtle
(*Clemmys marmorata*)



Fremont Cottonwood
(*Populus fremontii*)

Annual output



Sacramento River Ecological Flows Tool

File Edit View Reports Run Window Help

Run Models Output Choices Report Choices Output Viewer Finished Reports Preferences

Output Viewer - Annual View

Performance Measure	Description	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978									
Historical flows – No gravel augmentation																																																		
CH - Fall	Weighted useable area - spawning																																																	
CH - Late Fall																																																		
CH - Spring																																																		
CH - Winter																																																		
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CH - Winter																																																		
ST1																																																		

Select individual scenario x PM x year results of interest for more detailed outputs

Multi-year roll-up output

Output Viewer - Rollup View

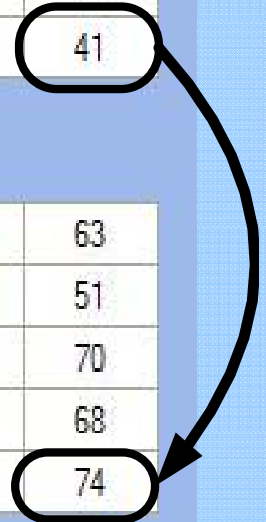
Performance Measure	Description		Multi-Year Rollup	% Poor	% Fair	% Good
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Historical flows – No gravel augmentation

CH - Fall	Weighted useable area - spawning	<input type="checkbox"/>		5	39	56
CH - Late Fall		<input type="checkbox"/>		23	32	45
CH - Spring		<input type="checkbox"/>		16	24	60
CH - Winter		<input type="checkbox"/>		12	28	60
ST1		<input type="checkbox"/>		19	40	41

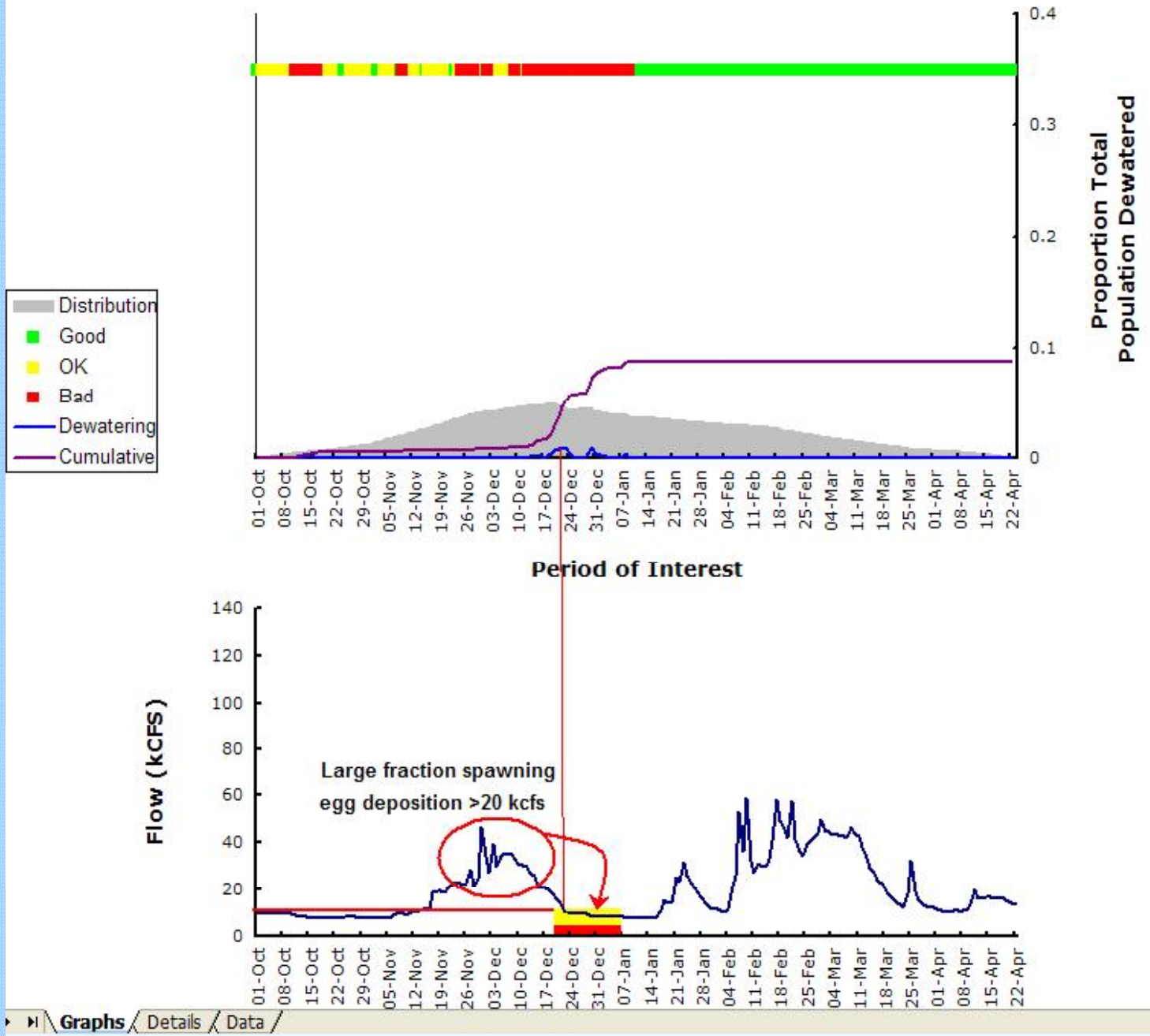
Historical flows – gravel augmentation

CH - Fall	Weighted useable area - spawning	<input type="checkbox"/>		5	32	63
CH - Late Fall		<input type="checkbox"/>		23	26	51
CH - Spring		<input type="checkbox"/>		9	21	70
CH - Winter		<input type="checkbox"/>		7	25	68
ST1		<input type="checkbox"/>		7	19	74



Drill down into details

SacEFT - Chinook & Steelhead Redd Dewatering Report

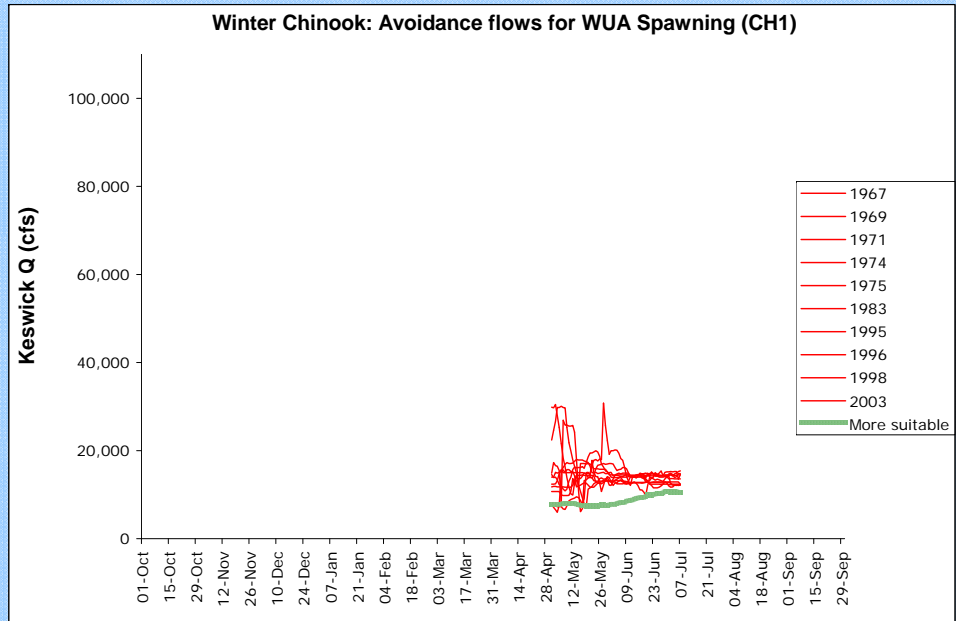
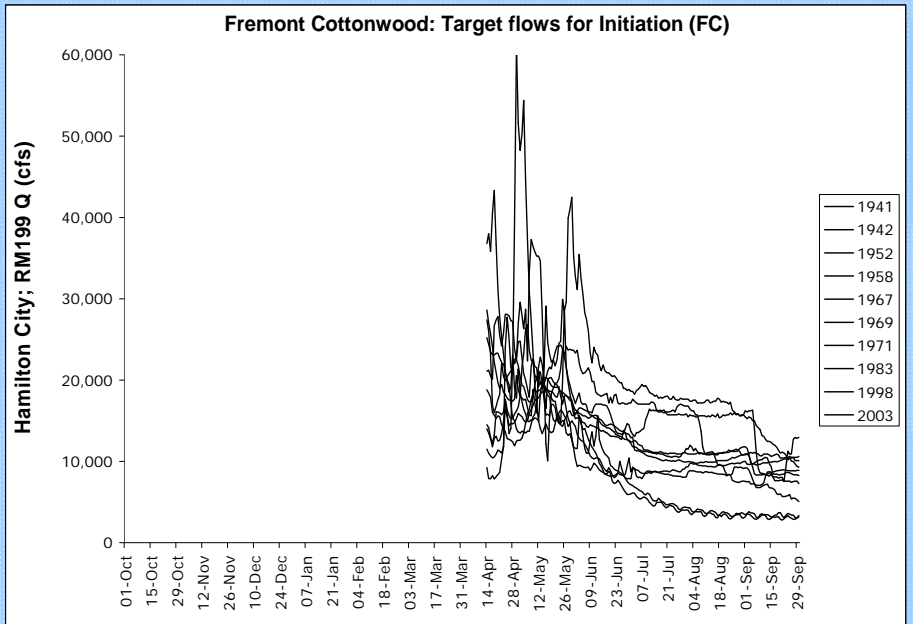
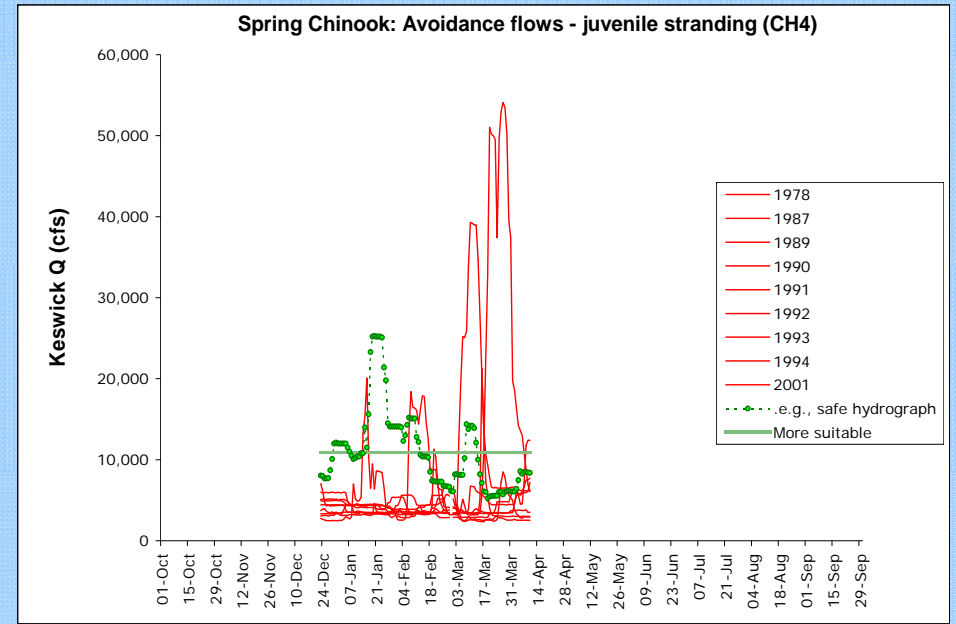
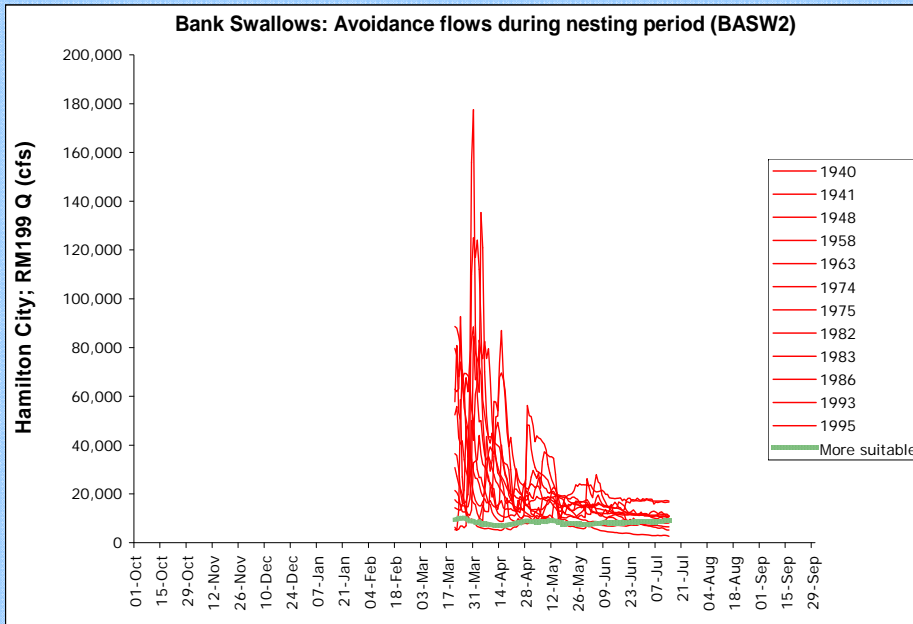


Target and avoidance flows



1. Target flows not required every single year
 - cottonwood recruitment flows needed once every 5 to 10 years
2. Trade-offs exist
 - there will be winners and losers in any year
3. Take advantage of different water years

Target and avoidance flows



Phase II



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DeltaEFT
Delta Ecological Flows Tool



DeltaEFT targets



Steelhead
(*Oncorhynchus mykiss*)



Chinook Salmon
(*Oncorhynchus tshawytscha*)



Green Sturgeon
(*Acipenser medirostris*)



Splittail
(*Pogonichthys macrolepidotus*)



Delta Smelt
(*Hypomesus transpacificus*)

Tidal Wetlands

Floodplain/
Riparian Habitats

Summary: How EFT adds value



1. Expands ecological considerations,
2. Provides multiple levels of communication,
3. Acts as an “eco plug-in” without re-inventing tools,
4. Catalyzes exploration of new alternatives.

Information



SacEFT software (version 2.0):

www.essa.com/tools/EFT/download.html

Sacramento River Ecological Flows Study:

www.delta.dfg.ca.gov/erp/sacriverecoflows.asp

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