2025

January 22, 1997

Pete:

I have reviewed your Jan. 21 e-mail and have the following comments:

I believe that there is an alternative hypothesis to the one your calculations have led you to formulate, i.e. "if closing the DCC has no adverse consequences, it has to be a better option for salmon migrating down the Sacramento River than a screened diversion at Hood."

I have used your general approach but used a different suite of assumptions. One overarching justification is that the survival rates estimated were developed using empirical mark-recapture data and were based on existing Delta configurations and operations. I contend they do not apply to a Delta with the configurations proposed in alternatives 2 and 3. Another reason for using different assumptions was that existing models likely underestimate the extent to which export induced reverse flows through Three-mile Slough or the lower San Joaquin River affect juvenile salmon survival. These effects are also likely to increased when the DCC is closed. The revised assumptions are:

1- Screen associated mortality (for screen at Hood) is 5 %.

2- The percent of the population exposed to the screen and affected by screen associated mortality is unrelated to the percent of the Sacramento diverted through it. At a .2 f/s approach velocity, fish will only be slightly affected by the percent of water diverted at Hood. Predators concentrated at the screem will not effectively prey on fish in more than 20 % of the river's cross section. For the purpose of this analysis, therefore, I used 20 %.

3- Survival of salmon diverted into the north Delta under the current channel and export configurations (Alt. 1) ranges from a low of 10 % to as high as 50 %. This is based on the USFWS smolt survival model which has been modified using late-fall information. For the purpose of this analysis I used 20 %.

4- Survival of salmon diverted into the north Delta under conditions associated with Alternative 2 are predicted to range from a low of 20 % to as high as 60 %. For the purpose of this analysis I used 30 %.

5- Survival of salmon diverted into the north Delta under conditions associated with Alternative 3 are predicted to range from a low of 50 % to as high as 80 %. For the purpose of this analysis I used 60 %.

6- Survival of salmon remaining in the Sacramento River is affected by the status of the DCC. When it is open under Alternative 1, the survival rates for the juvenile salmon remaining in the Sacramento River range from 50 % to 80 %. For the purpose of this analysis I assumed 70 %. When it is closed under Alternative 1, the survival rates range from 40 % to 70 %. For the purpose of this analysis I used 50 %.

D-060142

7- When the DCC is open under Alternative 2, the survival rates for the juvenile salmon remaining in the Sacramento River range from 60 % to 80 %. For the purpose of this analysis I assumed 75 %. When it is closed under Alternative 2, the survival rates range from 40 % to 70 %. For the purpose of this analysis I used 60 %.

8- When the DCC is open under Alternative 3, the survival rates for the juvenile salmon remaining in the Sacramento River range from 60 % to 90 %. For the purpose of this analysis I assumed 80 %. When it is closed under Alternative 3, the survival rates range from 60 % to 80 %. For the purpose of this analysis I used 70 %.

From here on I used your flow assumptions assuming 24,000 cfs at I Street:

	DCC Open	DCC Closed	
	Alt 1C	Alt 1C	Alt. 2B/3E
Flow diverted @ Hood	0	0	7,000
Flow through DCC	6,000	0	0
Flow through Georgiana	3,400	4,200	3,000

I used salmon split numbers similar to yours but calculated the numbers by assuming that each scenario begins with 100 juvenile salmon moving downstream just north of Hood:

	DCC Open	DCC Closed	
	Alt 1C	Alt 1C	Alt. 2B/3E
# salmon lost @ Hood Screen	0	0	1
# salmon diverted @ DCC	25	0	0
# salmon diverted @ Georgiana	14	17.5	12
# salmon remaining in Sacramento R.	61	82.5	87

The resulting overall survivals to Chipps Island would be:

	DCC Open	DCC Closed		
	Alt 1C	Alt 1C	Alt. 2B	Alt 3E
# salmon surviving diverted @ DCC	5	NA	NA	NA
# salmon surviving diverted @ Georgiana	3	3.5	4	7
# salmon surviving remaining in Sacramento R.	30.5	41	52	61
Total Survival (%)	38.5	44.5	56	68

These calculations indicate that closing the DCC under existing conditions improves survival by about 16% from the base condition (Alt 1 C with DCC open). Alternative 2B improves survival by 45 % from the base condition while Alternative 3E improves survival by 77%. Under conditions when the DCC would be left open survival is estimated to be 48 % for Alt. 2B (a 25 % improvement over base) and 65 % for Alt. 3E (a 69 % improvement over base).

My overall conclusion is that the screened diversion at Hood would provide a significant benefit for salmon outmigrating from the Sacramento. The small mortality associated with the screened diversion is not a significant factor nor is the fact that fish will be more concentrated in the remaining volume of water flowing past Hood. When the DCC must be opened under Alt 3 the reduction in survival is small (68% versus 65%).

Petesal

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