

Meeting Minutes

Significant Technical Issues

Diversion Effects on Fish, Including the Entrainment and Flow Effects on Fish

Can diversion effects in the South Delta be offset by:

- habitat improvements,
- modifications to the three alternatives?

What is the probability of recovery with:

- pumping 6-6.5 MAF from South Delta(Alt 1 and 2),
- diverting 10,000 cfs to central Delta through a screened facility at Hood(Alt 2),
- using a dual conveyance system(Alt 3)?

Which specie population and their life stages that are most sensitive to diversion effects and where and when are they most effected?

What are the direct effect physical effects to life stages of various species (screens, entrainment, flow patterns, habitat changes favoring predators, etc.)?

What is the effect of the operational plan for the alternative? Which species would benefit, which wouldn't care, and which would be hurt? Can the operational plan be flexible to fish needs?

What are the indirect effects of an alternative on fisheries (Delta hydrology, dredging, X2, water quality, ecosystem productivity, etc.)?

What the areas of uncertainty associated with each alternative in reference entrainment and flow effects?

What are increments of protection under such programs as: the water quality control plan, CVPIA, VAMP, biological opinions and operational changes on reservoirs?

What Sacramento River flow is required below a Hood diversion to protect salmon, striped bass and delta smelt?

What are the population level benefits of various levels of reduction in direct and indirect mortality due to diversion effects?

Diversion Effects on Fisheries

February 19, 1998

1:00 to 3:00pm

General

1. To determine impacts on fisheries need to know the operational constraints of the South Delta diversions, diversion on the Sacramento River, and the associated operation of storage on the Sacramento River Tributaries.
2. What are the total effects on diversions on fisheries? Effects such as changes caused by diversions in flow patterns, dredging, water quality, Delta hydrology, and location all need to be considered in evaluation.
3. The most likely species that would be directly affected by the point of diversion are San Joaquin River salmon, Sacramento River salmon, Delta Smelt and striped bass. Other populations that are effected ,but to a lessor degree, are splittail, steelhead, and white catfish.

San Joaquin River Salmon

1. What are the increments of protection under such programs as: the water quality control plan, CVPIA, VAMP, biological opinions and operational changes on reservoirs on the San Joaquin tributaries? Need to determine the effects of combinations of these programs.
2. What are the impacts of the operable fish barrier on Old River?.
3. What effect do the stage and salinity barriers in the south Delta have on upstream migrants?
4. What are the effects of the other areas of mortality from the San Joaquin River at Vernallis to Chipps Island?
5. What is the benefit of the new screens at the head end of CCF for San Joaquin salmon?
6. How will the water quality in the south Delta resulting from alternative 3 effect San Joaquin salmon?
7. In alternative 2, how will the increase flow of Sacramento river water into the central effect the migration of San Joaquin salmon?
8. Will discharges (if any) from the isolated facility affect the upstream migration of San Joaquin salmon?
9. How will channel improvements in the south Delta affect the fall adult migration.
10. How will constant flows into CCF through the new screens affect upstream migration of adults?

11. What is the alternative that gives the best chance to recover San Joaquin salmon?

Sacramento River Salmon

1. What are total impacts on Sacramento River salmon of a diversion at Hood, for alternatives 2 and 3?
2. What are the total effects on Sacramento River salmon of alternatives 1, 2, & 3.
3. What are impacts of reduced flows on smolts downstream of Hood diversion?
4. How important is QWEST and what are the tradeoff's on Sacramento River salmon and pumping in the south Delta?
5. Do juvenile salmon rear in Delta?
6. What are relative effects of DCC, Georgina slough, etc on numbers and mortality of salmon smolts?
7. What are total effects of Delta Ag diversions on salmon?
8. Should we screen Hood diversion in alternative 2?
9. What is the alternative that gives the best chance to recover Sacramento River salmon?

Delta Smelt

1. What are the hydrologic conditions that affect Delta smelt at alternative intake locations?
2. Under what hydrologic circumstances are smelt exposed to diversions(year type, frequency, and time period)?
3. Is the rate of export a main driver for taking fish in south Delta?
4. Must look at all factors together that impact smelt such as hydrologic conditions, operations and ERPP.
5. Is entrainment a key driver of populations of Delta smelt or more of an indicator of performance of the project?
6. For different points of diversion, what are the bypass and habitat requirements?

7. How do the Rio Vista flows contribute to or take away from transport and habitat conditions verses the impacts of diversions in the south Delta?
8. How much of an indicator of total impacts on populations are the diversion impacts?
9. How important are flow patterns to Delta smelt in different locations in the Delta?
10. What is the alternative that gives the best chance to recover Delta Smelt?

Striped Bass

1. What is the survival of striped bass eggs and larvae through best feasible technology screens and through pumps?
2. What is the percentage of striped bass exposed to screens and pumps in each alternative?
3. What is the position of eggs and larvae in the water column and how does this affect percent exposure to screens.
4. What are the appropriate bypass/transport flows in the Sacramento River below a diversion at Hood required to keep eggs and larvae in suspension?
5. What are juvenile striped bass impacts caused by diversions?
6. Is avoidance of predation in CCF the largest benefit to juvenile striped bass of moving the screen to the head end of CCF?
7. Is the impacts of salvaging fish at the new screens the same as the present system?
8. What are the tradeoffs of entraining few juveniles and many eggs and larvae at Hood verses entraining eggs and larvae at south Delta pumps?
9. What are the overall impacts of providing bypass flows at Rio Vista from upstream storage (Shasta and/or alternative storage) on other species in other time periods? (Need operation studies).
10. What is the risk to upstream migrants from the attraction to the downstream side of the pumps and screens at Hood in alternative 2?
11. Will protecting eggs and larvae of striped bass recover the species?

12. How much of an impact is the amount of Delta outflow and offshore fishing?
13. What are impacts of bypass flows on the Sacramento River past Hood on the upstream migration of striped bass?
14. What is the alternative that gives the best chance to recover Striped Bass?

Rating Matrix

Develop a rating matrix that compares the life stages of fish (i.e. striped bass eggs and larvae, juveniles ,and adults) against entrainment, flow volume and direction for each alternative.

Sample questions for Policy:

- Which species populations are effected by diversions?
- What are the effects of each alternative on species considering rate of entrainment, flow rates and directions in the Delta.
- Detailed example: What are the impacts of Rio Vista flows on Sacramento River Salmon, Striped Bass and Delta Smelt?

Next Meeting

Tuesday, March 3rd, 1:00-3:00