

Salmon Subcommittee's Responses to the Three Focal Questions

1) Which species, populations, and life stages are most sensitive to diversion effects under existing conditions No Action and Alternatives 1, 2, and 3? When and where are they most affected?

The salmon subcommittee evaluated diversion effects in the Delta on San Joaquin basin chinook salmon and an aggregate of all races of Sacramento-basin chinook. All San Joaquin chinook migrate through the south Delta, where they experience direct entrainment, predation in Clifton Court Forebay, and reduced survival associated with unfavorable flow distributions. A much smaller portion of Sacramento chinook are affected by diversions from the south Delta.

Substantial negative effects exist for both groups under existing conditions, and those would persist under No Action and Alternative 1, although direct entrainment losses would be reduced by a small increment under Alternative 1. Under Alternatives 2 and 3, the entire population of Sacramento chinook would emigrate past a screened diversion at Hood, and would be exposed to flow reductions in the Sacramento River downstream of Hood. Adverse effects unique to Alternative 2 would be increased straying and migratory delay of adult salmon returning to the Sacramento basin, due to both attraction to the Mokelumne River portion of the Delta and exposure to a fish passage facility at the Hood diversion. Under Alternative 2, direct and indirect effects in the San Joaquin portion of the Delta would be less for salmon from both rivers. Those effects would be further reduced under Alternative 3.

Fry rearing in the Delta is important to salmon production, especially in wet years. Diversion effects are believed to be greater on actively migrating yearlings and smolts, whether rearing takes place in the Delta or in upstream areas.

7) What degree of benefit and impact will the Common Programs provide?

Much of the expected benefit for salmon would result from restoration of shallow water habitat. However, the actual effect on salmon populations is uncertain. Salmon pre-smolts are particularly likely to use restored habitats. Restored habitats would also be favorable for predators but in the opinion of most salmon biologists the increased cover and food supply should increase salmon survival and provide net benefits. If habitat restoration is successfully implemented along migration corridors for salmon, benefits could be greater than estimated in this analysis. Screening Delta diversions and improved Delta water quality are also expected to be beneficial. Increased spring flows would slightly improve chinook survival in the Delta, in addition to providing upstream benefits. The Water Use Efficiency and Water Transfer programs would increase flexibility in water supply operations, offering some opportunities to shift diversions to times less detrimental to salmon, but such shifts would probably increase impacts on other species. Overall, the Common Programs are unlikely to provide sufficient benefits in the Delta to offset diversion effects fully.

5) What are the risks and chances of success of species recovery for each alternative?

Recovery depends on conditions throughout the life history of salmon. Because the subcommittee considered only needs of juveniles and adults in the Delta, the following answers

are more appropriate for addressing risks of precluding recovery by significantly adversely impacting one lifestage, rather than addressing the chances of success of species recovery.

No Action - Substantial adverse impacts to San Joaquin chinook in the south Delta under Existing Conditions would increase under No Action due to the increased exports from the south Delta. Although a smaller proportion of the Sacramento chinook are impacted by south Delta exports, substantial negative effects exist for both groups under existing conditions, and those would persist under No Action. The operation studies provided for these analyses assume the Delta Cross Channel gates are closed between November and June to improve survival of salmon migrating down the Sacramento River. The validity of this assumption during November and December was questioned by the subcommittee since water quality objectives often are in conflict during low flow periods. The ongoing efforts of the Ops Group to improve salmon survival under Existing Conditions in the face of limited operational flexibility, and the probable decrease in flexibility over time with the No Action scenario, indicate potential for precluding recovery.

Alternative 1- Delta Cross Channel gate closure to improve survival of salmon emigrating down the Sacramento River would continue to be in conflict with water quality objectives during low flow periods. Improved fish screens in the south Delta would provide additional protection, especially for San Joaquin salmon. These benefits would be tempered by the continued need for handling and trucking, but this is less of a risk for salmon than for many other species. Overall, reduced entrainment and benefits from the Common Programs probably would not be sufficient to cause major improvements in salmon production.

Alternative 2- The diversion at Hood would impose several new risks for salmon from the Sacramento system (see response to question 1 above). The subcommittee believes that Alternative 2 would pose risks for salmon from the Sacramento system greater than any other alternative, potentially resulting in population declines relative to Existing Conditions. For salmon from the San Joaquin, the combination of improved flow distribution in the central Delta, and benefits from new screens in the south Delta (see Alternative 1), would make Alternative 2 superior to Alternative 1.

Alternative 3- For Sacramento salmon, Alternative 3 would not pose the same risk for upstream migrants as Alternative 2. Other risks of the Hood diversion would be essentially the same as those described for Alternative 2. These risks would result in overall benefits about the same as for the Common Programs. San Joaquin basin chinook have the greatest potential to benefit from Alternative 3. The benefit that would be most certain is the reduction in entrainment losses associated with the large reduction in diversions from the south Delta.