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Maria de la Paz Carpio-Obeso
Ocean Unit, Chief
State Water Resources Control Board

Re: Review of "Report Supplement: Length-Specific Probabilities of Screen Entrainment of Larval Fishes Based on Head Capsule Measurements (Incorporating NFPP Site-Specific Estimates)." October 29, 2013. This a supplement to the July 31, report.

I have reviewed both documents noted above (October 29 and July 31, 2013), but primarily am basing my comments on the supplement, which is a revision to the July 31, 2013 document. This revision also includes a specific assessment for Diablo Canyon Power Plant. I am restricting my comments to matters specific to the modeling of entrainment reduction. Dr. Cailliet has also commented on these documents and his assessment covers other aspects of the reports.

1) I reviewed the earlier report (July 31, 2013) and made numerous comments concerning that document. The report is now complete and my earlier concerns about documentation and missing details of analyses have been all resolved.
2) In my opinion the approach taken by Tenera to estimate the reduction in entrainment with respect to screen slot dimension is well supported and appropriate with the following caveats:
    a. Recent ETM/APF approaches have been based on the idea that regardless of the species that are actually assessed they represent all meroplankton.
    b. The modeled estimates in entrainment reduction are only for fish. As noted in earlier comments, fish larvae comprise a very small percentage of total meroplankton and entrainment reduction from screening for all meroplankton would be less than 1%.
    c. The effectiveness of screening for fish larvae is likely to be site specific and will require site specific information for species. With such information the approach laid out in the report is appropriate.
3) The are two important comments concerning the use of the approach that are related to the use of ETM/APF in recent entrainment assessments
    a. The approach laid out discounts larvae by age. This is appropriate for population modeling (eg. projecting larval losses to adults or some stage beyond entrainment vulnerability) but is a departure from what has been done

in recent studies. Recent approaches have had as an assumption that all ages of larvae are of equal value. This is in part based on the idea that natural mortality is most likely due to predation and as such is important to the functioning of the ecosystem.

b. All recent assessments have used ETM as the base model for estimating impacts. As described in my earlier reports the underlying basis of the approach is that the species for which proportional mortality is calculated are considered representative of all species that are potentially entrained. This allows estimation of the "ecosystem" effects.

   The approach described in the Tenera document is not directly useful for the "ecosystem" level assessment. This is because the effect of slot dimension on entrainment probability is specific to each species because of species specific morphology. There may be a way to incorporate reduction in entrainment dues to screens in a traditional ETM/APF assessment (I proposed such an approach) but this needs to be worked out. The average reduction across the length increments would be one way to model this effect.

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