Agenda Item E.1.d
Supplemental Public Comment
March 2015

Ms. Dorothy Lowman, Chair
And Members of the Pacific Fishery Management Council
7700 NE Ambassador Place #200
Portland OR 97220-1384

RE: Agenda Item **E.1 California Current Ecosystem Report Including Integrated Ecosystem Assessment**

Dear Ms. Lowman and Council members,

As a retired NMFS biologist with a continuing interest and involvement in CPS and ecosystem modeling, I appreciate the Council's consideration of the following comments, which I provided by email to the IEA authors after reviewing the IEA report and draft IEA update power-point presented to the CPS Management Team and Advisory Subpanel at a recent webinar. I assume this presentation will also be made to the Council. I am submitting these comments at the suggestion of the California Wetfish Producers Association.

The IEA reports are becoming a very interesting series and they are obviously going to have a significant impact on how we manage fisheries on the West Coast. The 'popular science' approach will make them much more visible and useable to the public who often are uninterested with the 'hard science" approach. Obviously both are necessary.

Given the above, and noting that I have not yet seen the in depth IEA documents, I have a number of comments that might be of interest to the authors and the Council. I realize that power-point presentations have significant limitations and that emphasis and explanations that are given verbally during the presentation often clear up contradictions and omissions in the power point. I also realize that power-point presentations are often viewed by people who are not present at the presentation, and these people take slides from Government power-points to 'prove' their point.

As you will see below, I am one of those people.

The 'cartoon' approach can be very effective; however, it can also be very misleading to the public. One of the things I have noticed over the last few years of the "forage fish controversy" is that ecological interactions appear to be limited to animals eating forage fish and there is no mention of any effect caused by forage fish consuming other species. Given that the biomass of forage fishes is larger than the biomass of their predators, one would expect that the consumption of food by the forage fishes would have a larger ecological effect than the much smaller consumption by their predators.

I see no appreciation of this in the cartoons. So how do you resolve this?

Slide 2 – Integrated Socio-Ecological System. Focal ecosystem components: ecological integrity. Add zooplankton to the list.

Slides 3,4,6 Ecological Interactions. The circle shows salmon eating forage fishes. Add krill in front of the forage fishes, implying that they eat zooplankton. This cartoon, which is repeated several times, gives the impression that the IMPORTANT ecological interaction is fish eating forage fishes. I saw an early version of this cartoon about 60 years ago. It showed a BIG fish eating a fish eating a little fish. Hopefully this cartoon concept can be re-cycled in the IEA.

Slide 5. This is more like it. However, marine mammals are added to the ecological interactions and probably due to a "typo type" mistake ecological interactions are left out of the loop.

Slide 9 - Regional physical forcing trends: This is an important slide with a huge amount of information; but I think you should note that there is no spring transition at 33 N. Also you should state what you are using to define the spring transition. From the graphics it appears to be when the trend changes from downwelling to upwelling. And if this is the case it is the explanation for no spring transition at 33 N. At 33 N the monthly mean upwelling index, (i.e. climatology) is always positive.

Slide 11 - Forage availability: There are two things that these data suggest to me. Although the actual fishery independent sampling is not given; the Northern California Current figures are either totally misleading or else they are early life history samples showing abundance of eggs, larvae or small juveniles that are sampled with very small mesh nets; probably zooplankton nets. For example the sardine has a single high outlier year (2004). This is the only year in the time series that has abundance above the mean and it is a log mean, which de-emphasizes its value. Obviously the fishery independent data are completely contradictory to the fishery dependent data. The fishery data clearly show that an extensive population of sardine has been present in the Northern California Current for most of the time period shown.

The common presence of extreme outliers in the NCC data set and the use of log means make me wonder about sampling error with these data. Note that the whitebait smelt data have one year above the mean and all other years are below the mean.

I am not suggesting that the data should not be shown, rather that they should not be shown with a misleading explanation (i.e. abundance of forage groups to predators). If these data are Early Life History information they may be very important to predators like Cassin's auklets that take small prey. But they are then not valid estimates of the abundance of the forage fish adults as prey for sea lions. The devil is always in the detail. Having fishery independent data is very important; however, it does not mean that the fishery dependent data can be ignored.

The second piece in this slide that sticks out is the very low abundance of sardine and anchovy for the last 5 years in the Central California Current and the very high abundance of rockfish, sanddabs, squid and krill. Again it appears that these data are ELH stage abundances.

This brings up the point raised earlier, is everyone totally ignoring the possibility that high abundance of the major CPS species may depress ELH survival of other fishes and squids that consume zooplankton in their ELH stages? Is the low abundance of anchovy and sardine ELH stages related to the high abundance of other species? Of course we do not know the abundance of older anchovy in the Central California Current, but we do know from the very extensive fishery dependent information on sardine that this population has been down-trending in the last few years and that the current abundance is probably less than 20% of the most recent peak.

I would not be surprised to learn that zooplankton abundance is a limiting factor of the total fish biomass in the California Current and reductions in one species, either through climatic forcing or fishing mortality, allows increases in others.

Slide 15 - next to last slide: Again the idea that the IMPORTANT and in this figure the EXCLUSIVE ecological interaction between humans and the ecosystem is through the CPS fishery. I think the authors should at least consider linking the Human Activities box to the Ecological interactions box. After all, the human activities in that box catch fish other than CPS.

Richard H. Parrish