North Pacific Fishery Management Council

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MINUTES
Scientific Statistical Committee
Conference Call June 26, 2003

The Scientific Statistical Committee held a conference call to discuss the habitat section of the Groundfish PSEIS as requested by the North Pacific Fishery Management Council. The following members participated:

Rich Marasco, Chair	Jack Tagart Vice Chair	Keith Criddle
Gordon Kruse	Anne Hollowed	Terry Quinn
George Hunt	Sue Hills	David Sampson
Steve Hare		

GENERAL COMMENTS:

The issue here is not so much with the methodology, which is a straightforward application of the Fujioka model combined with fishing intensity information. Rather, it is the philosophical concept underlying habitat protection, along with the interpretation of the methodology in finding a conditionally significantly negative impact related to Alternatives 1 and 3.

The interesting scientific issue is the clash of two paradigms concerning the spatial and temporal allocation of harvesting. The classical paradigm (say, the "proportionate" paradigm) has been that it is desirable to spread out harvesting in time and space in relation to population biomass, so that all components of the population receive equal harvesting rates. This concept has been especially prominent in the consideration of Steller sea lion protection measures to avoid local depletion of prey species, such as walleye pollock, Pacific cod, and Atka mackerel.

In contrast, the emerging "habitat" paradigm suggests that it may be better to concentrate harvesting in space (and by corollary, in time) to avoid uniform degradation of all habitats. This is adequately explained in section 4.1.3.2 of the document, assumption 2: "Relative to habitat distribution, spatially diverse or patchy fishing impacts are preferable to uniformly distributed impacts (Duplisea et al. 2002)." Other reviews (e.g., NRC 2002) have concluded that benthic habitat effects are most effectively mitigated, not with a single management tool, but with a balanced combination of area closures, fishing effort reductions, and gear modifications with the optimum combination depending on the particular fishery and ecosystem.

These two paradigms are in direct conflict, showing that different fishery management objectives can lead to apparent irresolvable differences. At the current time, it is impossible to tell which of these paradigms will emerge as being more preferable to achieve the conflicting objectives. Consequently, the document should explain conflicts in competing objectives related to habitat and sea lion protection. Furthermore, the main conclusion of the document should be that it is important to craft closed areas to avoid unintended consequences. It should be pointed out that the finding of a negative impact should not lead to an outright rejection of a particular Alternative, as the evaluation of Alternatives should be based on their overall impact on the environment and fisheries. Because the EFH model analysis had to rely on a number of assumed values for important parameters, the finding of negative impacts in an area may only indicate an issue demanding further consideration and analysis, rather than a significant flaw in the design of an Alternative.

For the purpose of quantitatively assessing the effects of fishing on habitat, analysts constructed an innovative model. However, data limitations require assumed values for some key parameters. In doing so, the analysts provided values for "plausible ranges" of habitat effects. These include recovery rates for fishery disturbed macro invertebrates that represent faster and slower recovery times. Estimates of fishery impacts within the model are weighted for fishing intensity in each 5-km^2 block throughout the Bering Sea/Aleutian Islands (BSAI) and Gulf of Alaska (GOA). The recovery rate for each block is uniformly applied. Model runs were made for both fast and slow recovery rates. Model outputs suggest that under slow recovery rates large percentages of habitat area are affected by fishing. Whereas at faster recovery rates, impacts would be expected to be substantially lower. The SSC is concerned about how one might utilize available empirical data to scale the more likely recovery state for each assessed block.

Slower and faster recovering invertebrates are patchily distributed throughout the fished habitats of the BSAI and GOA. Trawl survey data provides some insight into their spatial distribution although at a much coarser scale than that used for the block analysis in the habitat model. In addition, there are finer spatial scale records of invertebrate incidental catch from commercial fishery observers; however, these records are often in grouped invertebrate categories. Analysts are encouraged to evaluate the trawl survey and commercial fishery data to: 1) class the invertebrate categories as either fast or slow recovery species and 2) to subsequently map their distributions. Ultimately, analysts may be able to class the 5-km^2 habitat blocks as representing predominately fast or slow recovering invertebrate communities. Once the recovery rate for each block is assigned, the habitat model could then be rerun to integrate the estimate of fishery impacts.

A second element of discussion in the PSEIS regarding fishery effects on habitat is the spatial diversity of fishing effort. As presently derived, fishing effort is classed into one of several bins representing estimates of total area fished for each 5-km^2 block. The intensity of fishing is assumed uniform over the block. Special consideration was given to blocks with high fishing intensity ($f \geq 1$). These are singled out as locations for potential mitigation by means of select fishery closures. NMFS has access to VMS data depicting very precise vessel location. These data should be useful in evaluating the extent of overlap among fishing vessels in their fishing locations. This empirical information may validate or modify the perception of uniformity versus patchiness in the distribution of fishing effort. Since patchiness in fishery effort is regarded as a mitigating benefit to habitat affected by fishing, the SSC encourages the analysts to explore the VMS data as a means to test their assumptions of spatial distribution of fishery effort.

SPECIFIC COMMENTS:

1. The SSC reviewed section 4-10 of the PSEIS. The analysis of the habitat impacts of adopting the Alternative 3 policy acknowledges that the effects are uncertain. This uncertainty resulted in green or red outcome in Table 4.11-2. The SSC notes that application of a more conservative harvest policy for rockfish (e.g. F_{60}) and / or the application of the uncertainty correction in setting groundfish ABCs could mitigate potential displaced fishing effort in the GOA. The SSC also notes that the selection of closed areas appears to have been determined before the habitat impact criteria were identified. Thus, issues relevant to embedding closed areas in regions of heavy fishing were not considered when proposing specific MPAs or marine reserves to illustrate the Alternative. The SSC requests a clarification as to whether the placement of closed areas in Alternative 3 could include embedding small regions within existing trawl zones.

2. On page 4.1-25 of the PDF that was sent to the SSC, under section 4.1.6, Habitat Impacts Model, it would be helpful if the staff added information about the units for each parameter or variable and also presented the range within which they are expected to vary. It is not clear what is meant by "a value of equilibrium ...habitat level ...as a proportion of the unfished level...." Is this a measure of the amount of area disturbed, regardless of the degree of disturbance, or are the area, the frequency of disturbance, and the magnitude of disturbance incorporated? How does habitat recovery rate- Rho- vary with time to recovery? Small Rho means slow recovery, and large Rho a quicker recovery, but what is the range of values that Rho can take, and how do they relate to years since disturbance? Maybe a graph relating the two would illustrate your point. There is a need to better describe the model, as well as, how it is parameterized. Near the bottom of the page, it states that "habitat would be reduced slightly..." Does this mean in quality or in quantity or both?