**From:** Nancy Thompson
**Sent:** Thursday, January 07, 2010
**To:** Minkiewicz, Andrew
**Subject:** Re: RE: Concerns with Scallop F rates

Drew, sorry it's taken so long to respond, we all got caught up in the holidays the past week or so. You express several concerns about the magnitude of recommended catches for 2010 and observed landings in 2009. You also express concerns about the appropriateness of the Council's comparisons of current fishing mortality rates with existing and proposed modifications of the biological reference points for fishing mortality rates. In the following response we distinguish these concerns in two separate sections.

*Clarification of Catch Recommendations for 2010*
You correctly note that the SSC recommendation of an Acceptable Biological Catch (ABC) is 65.2 million lb based on an F=0.284. It is important to note that this estimate is for catch, including landings plus dead discards and incidental mortality. The ABC of 65.2 million lb drops to 57.8 million lb of landings when these additional removals are deducted.

The estimated landings of 56 million lb in 2009 would result in a preliminary F estimate of 0.30, compared to landings of 57.8 million lb in 2010 under an F of 0.284. Although the estimated landings in 2009 are slightly less than the landings projected under an F of 0.284 in 2010, the F is slightly lower in 2010 because the exploitable stock is expected to grow modestly in 2010, and more large U-10 scallops are expected to be landed in 2010 than in 2009. It is true that scallop biomass has been fairly stable in recent years, but there have been modest year to year variations that can affect estimates of fishing mortality.

*Incorporation of Uncertainty into Biological Reference Points and ABCs*
The MSRA mandate to incorporate uncertainty into the estimation of ABC and the increased responsibilities of the SSC, represent an important transition period for the management of fisheries. Recent technical advances by the Scallop PDT, and the inclusion of those results in the recommendations to the SSC, and subsequently to the Council illustrate how complicated that transition can be. In the following paragraphs I will summarize the technical basis of recent recommendations and address your major points.

The overfishing definitions in the Scallop FMP have not been modified for 2010. The fishing mortality rate proxy for F_MSY =0.29 remains in effect until a new value is approved as part of the Scallop FMP. The proxy for F_MSY currently used is the fishing mortality resulting in maximum yield per recruit, otherwise known as F_MAX . The determination of F_MAX is based on a set of parameters related to average size at age, selectivity of the fishery, and natural mortality rates.

Recall that, in developing Amendment 15, the SSC instructed the PDT to develop a method for quantifying scientific uncertainty to set an ABC below the overfishing level (OFL). At the request of the SSC, the PDT investigated the implications of uncertainty in these parameters. A simulation study of the consequences of this uncertainty resulted in an increase of the F_MAX value from 0.29 to between 0.36 and 0.37 (which will be proposed in Amendment 15 as the F corresponding

to the OFL). This new methodology is not formally included in the Scallop FMP until further review during the upcoming benchmark sea scallop assessment and adoption of Amendment 15.

The SSC is at liberty to use which ever parameters it sees fit when recommending a fishery's ABC for a given fishing year. For 2010, the SSC decided to use the stochastic analysis as proposed in Amendment 15 as the basis of its ABC recommendation. The Council, however, is responsible for setting an F target that prevents the current fishing mortality threshold being exceeded. Although the Council accepted the SSC's ABC recommendation for 2010, their decision on setting a target F was based on the overfishing definitions in the FMP, as well as achieving optimum yield over the long term.

It should also be noted that the current overfishing definition and calculation of ABC assume that fishing mortality is spatially and temporally uniform. In the case of the scallop fishery, fishing mortality is highly non-uniform, due in part to rotational and EFH closures. Because of this, landings corresponding to the ABC in 2010 would induce localized overfishing in the open areas. Therefore, the lower target F approved by the NEFMC gives greater long-term landings than higher F targets.

A preliminary estimate of F in 2009 suggested a value of about 0.30. I emphasize that the estimate of F for 2009 is preliminary. Dr. Hart informed the PDT and Scallop Committee that this estimate was indicative, but not definitive, and that it would have to be reviewed at the upcoming benchmark in June 2010. The landings data for 2009 are not yet complete, and the model formulation represents an update of the formulation used at the last benchmark assessment. This model formulation may be revised as a result of the next benchmark assessment. Revisions of reference points, such as incorporation of the stochastic approach approved by the SSC, will also be considered during the assessment. The status determination made during the last benchmark stock assessment in 2007 (i.e., that sea scallops were not overfished and overfishing is not occurring) remains in effect until the next assessment is completed and reviewed in 2010.

We believe that the industry has drawn an inappropriate parallel between the functions of the stochastic analysis and assessment model. The stochastic analyses identify an F_MSY proxy that is applied to projected catch, whereas the assessment model derives a fishing mortality estimate from previous fishing years through actual landings data. The estimate of actual F for a given fishing year does not depend on whether a deterministic or stochastic reference point was used to determine the target F rate for that given year, so the preliminary 2009 F estimate requires no adjustment