New England Fishery Management Council
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C. M. "Rip" Cunningham, Jr., *Chairman* | Paul J. Howard, *Executive Director*

To: Paul J. Howard, Executive Director
From: Scientific and Statistical Committee
Date: 21 September 2012

Subject: Herring ABC for FY2013-2015

The Scientific and Statistical Committee (SSC) met on September 12, 2012 to address herring catch recommendations.

The SSC was asked to:

1. Review the available information provided by the Herring Plan Development Team (PDT) and develop recommendations regarding the specification of acceptable biological catch (ABC) for the 2013-2015 fishing years, as well as an ABC control rule.

In order to meet these terms of reference, the SSC considered the following:

1. 54th Northeast Regional Stock Assessment Workshop Assessment Summary Report
2. 54th Northeast Regional Stock Assessment Workshop Report
3. Panelist reports (Francis, Hall, Klaer, and summary by O'Boyle) from SARC 54
4. Presentation from lead analyst on Atlantic herring stock assessment
5. Presentation from Herring Plan Development Team

The SSC reviewed material provided by the herring PDT regarding two alternative ABC control rules for use in setting the ABC for FY2013-2015. The presentations by Jon Deroba and Lori Steele as well as the herring PDT report were clear and concise, facilitating the catch advice discussion. One control rule applied 75%Fmsy in all three projection years, while the other found the constant catch over the three projection years which had at most a 50% chance of overfishing in any of the three years. In this particular situation, these two control rules resulted in a total catch over the three years which is approximately the same (320 vs 342 thousand metric tons). There is a higher risk of overfishing in the first year associated with the 75%Fmsy control rule and a higher risk of overfishing in the second and third years associated with the constant catch control rule. The SSC could not find any scientific reason to prefer one of these control rules over the other and considered them to be comparable in terms of risk of overfishing, given the information available. The SSC notes that it is not appropriate to "mix and match" the ABC values from the two control rules, meaning that the FY2013-2015 ABC cannot be set as 130, 114, and 114 thousand metric tons, respectively. Instead, the Council should pick the control rule that they feel is most appropriate for the fishery and then use the three ABC values associated with that control rule as they set management regulations.

The SSC considered a number of characteristics of the fishery and stock assessment before arriving at this decision regarding the control rule for the next three years. The stock assessment made a major advance by considering the change in natural mortality needed to both reduce the

retrospective pattern in the assessment and to more closely match the estimates of consumption by fish and marine mammals. The change in natural mortality rate combined with the estimation of a stock recruitment relationship in the assessment led to a fishing mortality reference point that is approximately half of the current natural mortality rate. The current estimated stock size is well above the biomass reference point and there are indications of a strong year class entering the fishery. All these factors lead the SSC to conclude that either control rule can be applied for the next three years with low probability of overfishing or causing the stock to become overfished.

While not an explicit term of reference, the SSC did discuss the role of herring in the ecosystem and options for setting ecosystem-based ABCs, as requested in the letter from Regional Administrator John Bullard to Council Chair Rip Cunningham. As a forage fish, concern was expressed that standard fishery reference points may not be appropriate. The SSC notes that both control rules for the next three years would result in fishing mortality rates well below the natural mortality rate and a stock size that is well above the standard biomass target, thereby likely meeting ecosystem-based biomass targets for a forage species by default if not by design.

However, the SSC requests guidance from the Council as to how it would like to see this stock managed, i.e., as a typical fishery with MSY-based reference points, or at a reduced fishing rate and higher stock size to account for its role in the ecosystem. This would ensure that the next time herring are assessed, a control rule could be created which meets the needs of the Council. A control rule which could be set for more than three years would need to consider a wide range of possible stock conditions and have a known objective. For example, the constant catch control rule for the next three years is acceptable because of the reduction in catch in the first year relative to the 75%Fmsy control rule. It is not clear whether a constant catch control rule which had larger initial catch than the 75%Fmsy control rule would be acceptable. Furthermore, the constant catch of 114 thousand metric tons for the next three years is not expected to be continued in perpetuity. Rather a new constant catch value would have to be estimated for the next set of forecast years, especially as the strong 2008 year class moves out of the population. One option that could be considered in a more complete control rule would be the use of indicators during the three years that could provide feedback regarding the performance of the control rule, and possibly indicate the need to re-evaluate the ABC for the second or third year.

The SSC recommends the use of either the 75%Fmsy or the Constant Catch control rule for herring for the next three years. The overfishing limit (OFL) and acceptable biological catch (ABC) in units of thousand metric tons for FY2013-2015 under the two separate control rules are:

Control Rule	Catch	2013	2014	2015
75%Fmsy	OFL	169	127	104
	ABC	130	102	88
Constant Catch	OFL	169	136	114
	ABC	114	114	114