



New England Fishery Management Council

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To: Tom Nies, Executive Director
From: Scientific and Statistical Committee
Date: November 17, 2015

Subject: Overfishing levels (OFLs) and acceptable biological catch (ABC) recommendations for red hake for fishing years 2016 and 2017.

The SSC met on October 13, 2015 in Providence, Rhode Island, to address the following term of reference (TOR):

Review the work of the Whiting PDT and provide overfishing level (OFL) and acceptable biological catch (ABC) recommendations for each of the northern and southern stocks of red hake each year for fishing years 2016-2017 that will prevent overfishing.

To address this TOR, the SSC considered the following information:

1. Memo from Andrew Applegate to the SSC re: Whiting PDT recommendations for OFL and ABCs for northern and southern red hake stocks for fishing years 2016 and 2017
2. Annual Monitoring Report for Fishing Year 2014 with a Red Hake Operational Assessment for Calendar Year 2014
3. Small Mesh Multispecies Stock Assessment and Fishery Evaluation Report (SAFE) for Fishing Year 2013
4. Memo from SSC to Mr. Nies, Sept. 15, 2014 (*SSC_response_whitinghake_Sept2014_FINAL*)

Current specifications for northern red hake for fishing years 2015-2017 were set in 2014 using the three-year moving average of survey biomass over 2012-2014, and for southern red hake using the three-year moving average over 2011-2013. The 2014 survey data for the northern stock revealed a high abundance of young fish that contributed little to total biomass, and therefore did not affect OFL and ABC calculations. However, given the likelihood that these fish would enter the fishery while the specifications set in 2014 were in effect, there was potential for the industry to be harvesting an exploitable biomass much larger than assumed for the 2015-2017 catch limits. Also, the southern red hake specifications were based on the 2011-2013 survey data because some strata were not surveyed in the spring of 2014. This issue had been resolved analytically, so the 2014 spring survey data can now be used to set specifications. Consequently, the Council requested and NEFSC provided an assessment update in 2015 to track the progress of the apparent strong cohort.

The northern red hake assessment update confirmed that the high abundance of pre-recruit fish revealed in the 2014 survey was as large as previously estimated and will soon enter the fishery catch. To account for this new development, the OFL and ABC should increase. Using the outcomes of the assessment update, the PDT recommended to the SSC that OFL for the northern

stock of red hake should be increased to 556 mt and ABC should be increased to 496 mt for 2016-2017. The SSC supports this recommendation.

The southern red hake assessment update revealed that biomass has declined. Therefore, the PDT recommended to the SSC that OFL for the southern stock should be decreased to 1,816 mt and ABC should be decreased to 1,717 mt for 2016-2017. The SSC also supports this recommendation.

An increase in the biomass of the northern stock coincident with a decrease in biomass of the southern stock perhaps suggests that mixing is taking place between the two stocks and that some fish have shifted their distribution northward, or that the two stocks are actually a single stock. However, the 2010 red hake benchmark assessment found the evidence for the presence of two stocks versus a single stock to be equivocal. Furthermore, the increase in biomass in the northern stock was primarily young fish, which suggests that differential recruitment rates between the north and south might be driving the observed changes, rather than movement between the two stock areas. Environmental changes might be such that conditions in the north are becoming more suitable for reproduction, recruitment, growth and survival of the species, which would mean increasing productivity in the northern stock.

There are important implications for management strategies of mixing between the two stocks versus differential productivity driven by environmental changes. Therefore, the SSC recommends that research be conducted to shed light on the spatial dynamics of red hake.

Summary of recommendations

- 1. OFL for the northern red hake stock for 2016 and 2017 is 556mt, and OFL for the southern red hake stock for 2016 and 2017 is 1,816mt. ABC for the northern red hake stock for 2016 and 2017 should not exceed 496mt, and ABC for the southern red hake stock for 2016 and 2017 should not exceed 1,717mt.**
- 2. Red hake spatial dynamics and influential environmental factors should be explored as data allow.**