



## New England Fishery Management Council

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**To:** Paul J. Howard, Executive Director  
**From:** Scientific and Statistical Committee  
**Date:** September 13, 2011

**Subject: Acceptable Biological Catch Recommendations for Whiting for Fishing Years 2012 – 2014**

The Scientific and Statistical Committee (SSC) was asked to:

1. Recommend ABC for whiting stocks for fishing years 2012-2014.

In order to meet this term of reference, the SSC met August 10, 2011 in Boston, MA and considered the following:

1. Recommendations for Red, Silver, and Offshore Hake (Whiting) Allowable Biological Catches for 2012-2014, July 2011
2. Options for Whiting/Hake Biological Reference Points, MSY Proxies, And ABC, March 2011
3. Northeast Fisheries Science Center (NEFSC). 2011a. 51st Northeast Regional Stock Assessment Workshop (51st SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 11-01; 70 p.  
<http://www.nefsc.noaa.gov/publications/crd/crd1101/index.html>
4. Northeast Fisheries Science Center (NEFSC). 2011b. 51st Northeast Regional Stock Assessment Workshop (51st SAW) Assessment Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 11-02. <http://www.nefsc.noaa.gov/publications/crd/crd1102/index.html>
5. Presentations by Whiting Plan Development Team members Andy Applegate, Loretta O'Brien, and Larry Alade.

The Whiting plan development team (PDT) computed a range of possible Acceptable Biological Catches (ABC) for red and silver hake stocks in the north and south based on the SSC recommended method 2. This method evaluates the consequences of scientific uncertainty in both the overfishing threshold and in stock biomass distributions. The PDT also evaluated two signal to noise reduction methods, medium term projections for silver hake using the ASAP Run 6 results, and the social and economic effects of alternative ABCs. The SSC agrees with the PDT that the alternative smoothing approaches confirmed the results of the three year moving average approach and suggests further research on the use of alternative smoothing techniques be evaluated through the standard SARC review process. The ASAP projections were not informative. The social and economic effects could only be addressed superficially by the PDT due to a lack of an accepted model for projecting alternative catch streams in the future.

The lack of an accepted stock assessment model for all the whiting stocks prevented the PDT from conducting true risk analysis. The potential impact on the stock of different catch levels could not be estimated due to this lack of an accepted stock assessment model, and thus the risk of the stock becoming overfished is unknowable. Therefore, the SSC can only provide general statements

regarding potential risk of different choices of ABC for 2012 – 2014. Higher catches patently have higher probability of overfishing. Setting ABC equal to the OFL implies no buffer for scientific uncertainty in the assessment.

The Council has not expressed a risk tolerance level for the whiting stocks, which prevents the SSC from being able to recommend an ABC that corresponds to a specific probability of overfishing. Instead, the SSC is providing tables of possible ABC for each stock of red and silver hake where the Council can choose its level of risk tolerance regarding the probability of overfishing and then find the associated ABC from the table. In the silver hake tables, there are a range of probabilities of overfishing which have been removed due to the potential of bias in the estimation of the biological reference points. This potential bias is due to the choice of years used in calculating the reference point and the potential for a change in productivity of the systems. The highlighted and bolded rows in each table denote the recommended ABC for each stock. The table also provides the probability that the ABC will cause F to be greater than the median Fmsy proxy value. This column does not include uncertainty in the Fmsy proxy value and so should not be used as the basis for selecting an ABC, it is provided for information purposes only.

The SSC supports the PDT's proposal to combine the offshore hake ABC with the ABC for southern silver hake, because it is a mixed-species fishery, with a small portion of offshore hake in the mixed-species catch, and challenges in monitoring species-specific catch limits. The SSC agrees with the PDT recommendation to set the offshore hake ABC as a multiple of the southern silver hake ABC and monitoring the combined offshore hake and southern silver hake ABC. The SSC agrees with the PDT recommendation to use 4% as the proportion of offshore hake landings relative to the southern silver hake landings.

Many of the possible ABC values in Table 1 are associated with large increases in catch relative to recent amounts. Based on the experience of members in the SSC, large and sudden increases in catch are often associated with fishing mortality rates that are too high when later assessed. The SSC suggests that a gradual approach be used to increase the ABCs over time to prevent overcapitalization in the fishery and reduce the probability of exceeding sustainable catches.

**The SSC recommends the following ABCs for the whiting stocks, but notes that the ABC in any of the rows in Table 1 which are not crosshatched can be selected by the Council as the ABC for that stock based on its risk tolerance:**

- 1. 244 mt for northern red hake.**
- 2. 3,063 mt for southern red hake.**
- 3. 13,177 mt for northern silver hake.**
- 4. 32,635 mt for southern silver hake.**
- 5. Setting a combined offshore hake and southern silver hake ABC, calculated as 1.04 multiplied by the Council selected ABC for southern silver hake.**

Table 1. Acceptable Biological Catch (ABC; metric tons) for the four red and silver hake stocks. The first column provides the percentile of the overfishing limit (OFL) which denotes the statistical uncertainty associated with the ABC value provided in the second column. The third column provides the associated probability of the ABC exceeding the median of the Fmsy proxy. The final four columns relate the ABC to recent catches (e.g. 3yrAvg denotes an average of 2008-2010 catches). The rows with bold font and yellow background denote the SSC recommendation for ABC. The maximum value that the Council may select is the largest ABC for each stock which is not crosshatched (314 mt and 3448 mt for the northern and southern stocks of red hake, and 17,300 mt and 43,090 mt for the northern and southern stocks of silver hake, respectively).

Red Hake North		Prob F > median Fmsy	ABC- percentage of current catch			
Percentile OFL	ABC (mt)		2010	3yr Avg	5 yr Avg	10y Avg
5	75	0.00	24%	37%	35%	31%
10	134	0.00	43%	66%	62%	55%
25	223	0.00	72%	111%	103%	92%
<b>30</b>	<b>244</b>	<b>0.00</b>	<b>78%</b>	<b>121%</b>	<b>113%</b>	<b>100%</b>
40	280	0.08	90%	139%	130%	115%
50	314	0.37	101%	156%	146%	129%

Red Hake South		Prob F > median Fmsy	ABC- percentage of current catch			
Percentile OFL	ABC (mt)		2010	3yr Avg	5 yr Avg	10y Avg
5	2263	0.00	167%	156%	151%	165%
10	2524	0.00	187%	174%	168%	184%
25	2954	0.10	218%	203%	197%	215%
<b>30</b>	<b>3063</b>	<b>0.16</b>	<b>226%</b>	<b>211%</b>	<b>204%</b>	<b>223%</b>
40	3259	0.27	241%	224%	217%	237%
50	3448	0.43	255%	237%	230%	251%

Silver Hake North		Prob F > median Fmsy	ABC- percentage of current catch			
Percentile OFL	ABC (mt)		2010	3yr Avg	5 yr Avg	10y Avg
5	5363	0.00	216%	358%	372%	295%
10	7434	0.00	300%	496%	516%	408%
<b>25</b>	<b>13177</b>	<b>0.00</b>	<b>532%</b>	<b>878%</b>	<b>915%</b>	<b>724%</b>
35	17300	0.00	698%	1153%	1201%	951%
40	19600	0.04	791%	1307%	1361%	1077%
50	24840	0.52	1004%	1659%	1728%	1367%

Silver Hake South		Prob F > median Fmsy	ABC- percentage of current catch			
Percentile OFL	ABC (mt)		2010	3yr Avg	5 yr Avg	10y Avg
5	13072	0.00	184%	185%	210%	191%
10	18290	0.00	257%	259%	294%	267%
<b>25</b>	<b>32635</b>	<b>0.00</b>	<b>459%</b>	<b>463%</b>	<b>525%</b>	<b>476%</b>
35	43090	0.00	606%	611%	693%	629%
40	48860	0.04	687%	693%	786%	713%

50	62301	0.51	876%	884%	1002%	910%
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