New England Fishery Management Council
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Eric Reid, *Chairman* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: October 22, 2021

TO: Scientific and Statistical Committee

CC: Groundfish Committee

FROM: Groundfish Plan Development Team

SUBJECT: **Candidate OFL and ABC for white hake for fishing year 2022**

The Groundfish Plan Development Team (PDT) discussed a candidate overfishing limit (OFL) and acceptable biological catch (ABC) for white hake, based on the new rebuilding plan implemented under Framework Adjustment 61. The Groundfish Plan Development team met by webinar on October 13, 2021, and October 20, 2021.

1. Information reviewed included:

2019 stock assessment and peer review report, SSC reports, and PDT reports, survey information, and economic information.

2. Overview

This memorandum provides information to support FY2022 OFL and ABC recommendations by the SSC for white hake. The PDT applies the Council's default ABC control rule for groundfish stocks (see Amendment 16):

The ABC control rules will be used in the absence of better information that may allow a more explicit determination of scientific uncertainty for a stock or stocks. If such information is available – that is, if scientific uncertainty can be characterized in a more accurate fashion -- it can be used by the SSC to determine ABCs. These ABC control rules can be modified in a future Council action (an amendment, framework, or specification package):

a. *ABC should be determined as the catch associated with 75% of F_{MSY}.*
b. *If fishing at 75% of F_{MSY} does not achieve the mandated rebuilding requirements for overfished stocks, ABC should be determined as the catch associated with the fishing mortality that meets rebuilding requirements ($F_{rebuild}$).*
c. *For stocks that cannot rebuild to B_{MSY} in the specified rebuilding period, even with no fishing, the ABC should be based on incidental bycatch, including a reduction in bycatch rate (i.e., the proportion of the stock caught as bycatch).*
d. *Interim ABCs should be determined for stocks with unknown status according to case- by case recommendations from the SSC*

Appendix
This memorandum includes 1 appendix.

- Appendix 1 – CY2020 white hake catch estimates

3. Overview of the New Rebuilding Plan

The first year of the rebuilding plan is 2021 with no revision to the OFL and ABC in place. The $F_{rebuild}$ will be in place for 10 years of the plan (rebuilding by 2031), unless the Council is notified by NMFS that white hake is rebuilt, or the rebuilding plan is modified. $F_{rebuild}$ is $70\%F_{MSY}$= 0.117, which results in a 87.4% probability of achieving B_{MSY}.

The rebuilding plan assumes an updated estimated bridge year catch in CY2019 and fishing year ACLs plus the Canadian catch assumption in 2020 and 2021.

The PDT updated the estimated CY2019 catch from the previous estimate of 2,055mt (see Appendix 1). The ACL of 2,041 mt was used in 2020 and 2021. The 2021 Canadian estimate is based on a 3-year average (45.2 + 23.9 + 83.7).

year	US Catch/ACL	Canadian Catch	total
2019	2013.8	23.9	2,038
2020	2041	83.7	2,125
2021	2041	60	2,101

When the rebuilding plan was developed by the Council, the expectation at the time was that white hake would have a management track assessment in 2021, and a new OFL and ABC would be set for 2022. Delays due to restrictions from the COVID-19 pandemic led to rescheduling the stock assessment.

4. White Hake Assessment

Based on the 2019 operational assessment, the white hake stock is overfished and overfishing is not occurring. This is a change from the 2017 operational assessment, in which white hake was not overfished. The retrospective adjusted 2018 spawning stock biomass is estimated to be 15,891 mt, which is 50% of the biomass target. The 2018 fully selected fishing mortality was estimated to be 0.129, which is 77% of the F_{MSY} proxy. The stock shows no truncation of age structure. Estimates of commercial landings and discards have decreased over time. The rebuilding deadline for this stock was 2014, the stock is not yet rebuilt and is now likely overfished, and a new rebuilding plan was established.

Rebuilding projections were developed for white hake[1] using projections that resample recruitment from the entire times series (1963-2016) of the assessment which is consistent with the projections used to estimate SSB_{MSY}. Projections were done assuming an updated PDT estimated bridge year catch in CY-2019, assumed ACLs plus the Canadian catch assumption in 2020 and 2021, and F_{MSY} (F40% overfishing definition), $75\%F_{MSY}$, $70\%F_{MSY}$, $50\%F_{MSY}$, $25\%F_{MSY}$, and F=0 for T-min from

[1] See Framework Adjustment 61 Appendix III White Hake Rebuilding: https://www.nefmc.org/library/framework-61

2022-2031. The Council selected 70%F_{MSY} for the rebuilding plan. The revised rebuilding plan started in 2021 but the OFL and ABCs already in place for 2021 were not revised.

Short term catch advice for estimating ABCs and OFLs are made using projections that assume a more recent time series (1995-2016) of lower estimates of recruitment in the near term. Rebuilding projections which used the recent low recruitment assumption were also run as a sensitivity to show the implication of recruitment not increasing to the time series mean in 2019. It is not known when recruitment will approach the time series mean but the sensitivity projections suggest that rebuilding will not occur quickly unless there is a rapid increase in recruitment from recent levels. This may suggest that rebuilding projections which use the full time series of recruitment are likely overly optimistic. It is possible to rebuild the stock under the low recruitment sensitivity but the projection suggests 37%F_{MSY} (SSB $F_{rebuild}$ run sensitivity plot) would be needed to rebuild the stock. This suggests that a rebuilding plan closer to a T-max of 10 years may be more realistic rather than a projection closer to a T-min of 4 years.

Figure 1 shows survey indices updated since the last assessment. Recent survey trends appear flat with no change. The PDT notes the dome in the survey, and so survey indices may not line up as well with model projections.

5. Economic Information

In-Season Commercial Catches

Figure 2 shows groundfish commercial (sector and common pool) white hake catches since FY2017 along with the FY2021 commercial ACL. White hake catches have remained similar across the years from FY2017-FY2020, and do not appear to show a seasonal pattern.

Sectors

ACE lease prices were estimated for 11 allocated groundfish stocks for fishing years 2015-2019 using a hedonic price model. Figure 3 displays white hake. Input data into the model is comprised of 5,169 inter-sector ACE leases over the FY2015-2019 period. In general, no clear trends emerge in comparing first quarter prices to prices later in the fishing year. In FY2015 and FY2016, first quarter lease prices were higher, while in FY2017, 2018, and 2019, lease prices were higher later in the year.

Table 1 compares the performance of the quota-change model (QCM) since FY 2011 to realized outcomes. Performance of the QCM varies year to year (in some years it underpredicts, while in others it overpredicts) but generally has accurately predicted utilization trends. The accuracy of predictions for white hake is driven in part, by the relatively consistent realized catch across the time series. The QCM predicts catch/revenue by drawing from realized trips two years prior (e.g. FY2020 predictions are made by drawing from FY2018 trips). Generally, utilization of white hake has been high, particularly in recent years, concurrent with lower sector sub-ACLs.

6. Candidate OFL and ABC

The rebuilding deadline for this stock was 2014. It was not revised at the end of the rebuilding period because based on the 2015 assessment the stock was rebuilding (making adequate

progress). As advised by the Regional Office, the SSC and the Council continued setting catch limits to maintain fishing mortality at 75% F_{MSY}. Framework 59 set the 2020-2022 OFLs and ABCs based on this.

OFLs and ABCs set by Framework 59

year	OFL	ABC
2020	2,857	2,186
2021	2,906	2,186
2022	3,022	2,186

However, following the 2019 assessment in March 2020, the Council was notified that the stock was now overfished and, given that the rebuilding plan date had past and the stock was not rebuilt, a new rebuilding plan was required. Following the Council ABC control rule, the new rebuilding plan follows $F_{rebuild}$ for white hake which uses projections at 70%F_{MSY}.

Table 2 and Figure 4 summarize catch performance and changes in overfishing status for white hake. 70%F_{MSY} in 2022 results in a 31 mt decrease to 2,155 mt.

Possible candidate OFL and ABC (mt) for FY2022 for white hake, under 70%F_{MSY} projections (Frebuild).

year	OFL	ABC
2022	3,022	2,155

Tables

Table 1- Stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2011 and 2020 compared to realized catch and revenue (in 2020$) for white hake.

	FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev ($mil, 2020)	
			Realized	Predicted	Realized	Predicted	Realized	Predicted
White Hake	2011	2,974	2,990	2,607	*1.01*	*0.88*	7.1	7.3
	2012	3,257	2,414	2,219	*0.74*	*0.68*	7.8	5.2
	2013	4,142	2,025	2,029	*0.49*	*0.49*	6.5	4.6
	2014	4,308	1,721	1,932	*0.40*	*0.45*	6.1	6.4
	2015	4,313	1,581	1,689	*0.37*	*0.39*	5.4	5.6
	2016	3,434	1,432	1,780	*0.42*	*0.52*	4.8	6.2
	2017	3,333	2,014	2,071	*0.60*	*0.62*	4.7	7.2
	2018	2,713	2,083	1,907	*0.77*	*0.7*	4.5	6.3
	2019	2,715	2,044	2,691	0.75	*0.99*	4.3	6.2
	2020	2,004	1,790	1,839	0.89	*0.92*	4.4	4.1

Table 2- Catch performance (CY2010-CY2018), historical OFLs and ABCs (FY2010-FY2020), and catch projections for FMSY and 75%FMSY (FY2020-FY2021) and Frebuild (FY2022) for white hake.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F_{MSY}	$75\%F_{MSY}$	Frebuild	Updated OFL
2010	2,012	4,130	2,832					
2011	3,034	4,805	3,295					
2012	2,903	5,306	3,638					
2013	2,316	5,462	4,177					
2014	1,955	6,082	4,642					
2015	1,680	6,237	4,713					
2016	1,396	4,985	3,816					
2017	2,043	4,816	3,686					
2018	2,044	3,885	2,971					
2019		3,898	2,971	2,038				
2020		3,916	2,971	2,125	2,857	2,186		
2021				2,101	2,809	2,186		
2022					2,791	2,186	2,155	3,022

Figures

Figure 1- Stratified mean survey indices for white hake from the NMFS fall and spring bottom-trawl surveys, updated since the 2019 assessment.

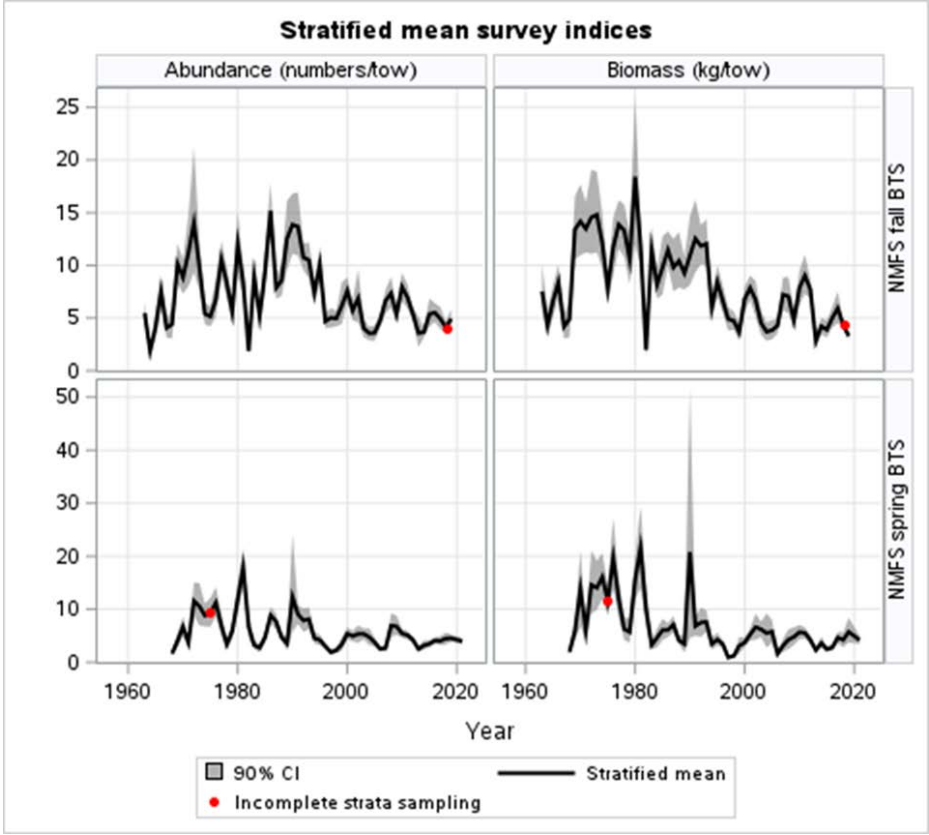


Figure 2– In-season utilization of white hake by the commercial (sectors and common pool) groundfish fishery.

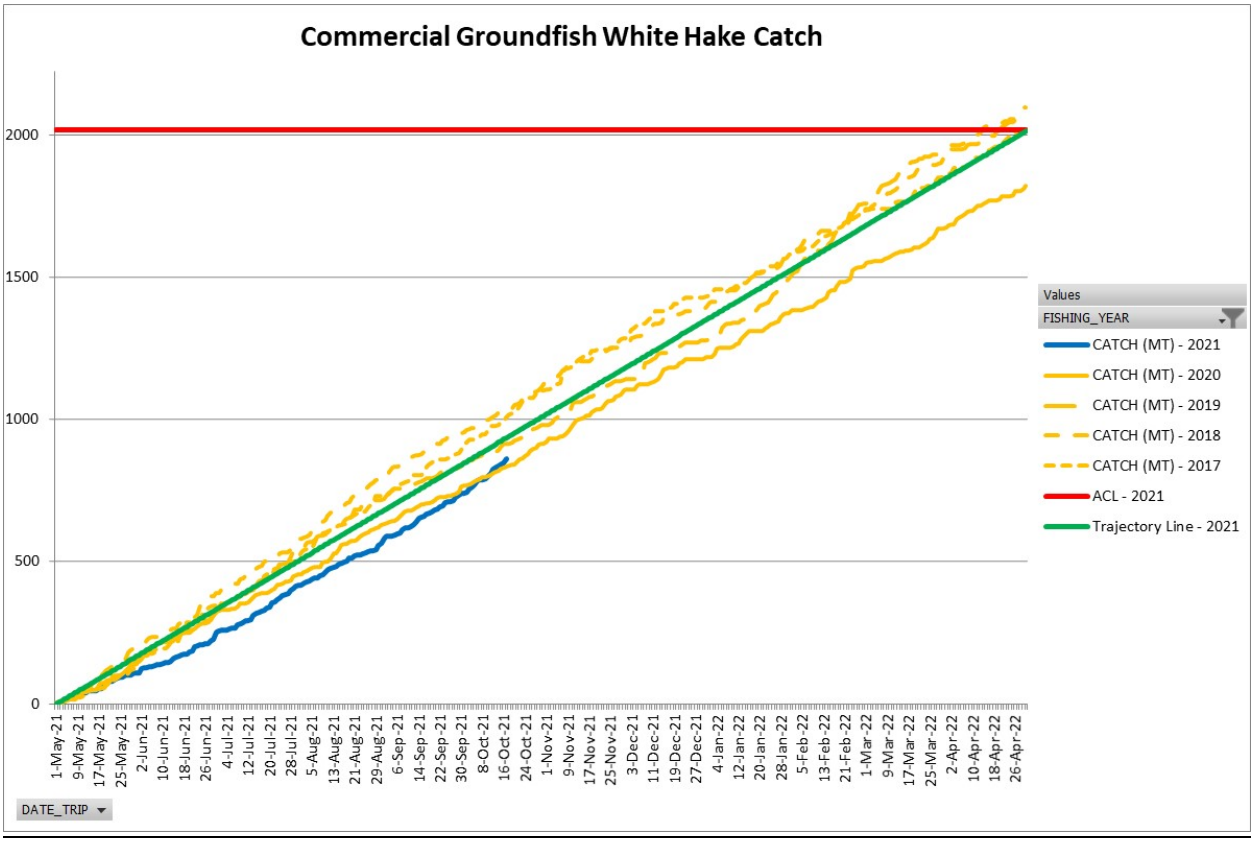


Figure 3– ACE lease prices estimated for white hake for fishing years 2015-2019 using a hedonic price model. First quarter (May-July) lease prices are indicated by the vertical gray bars in the figures.

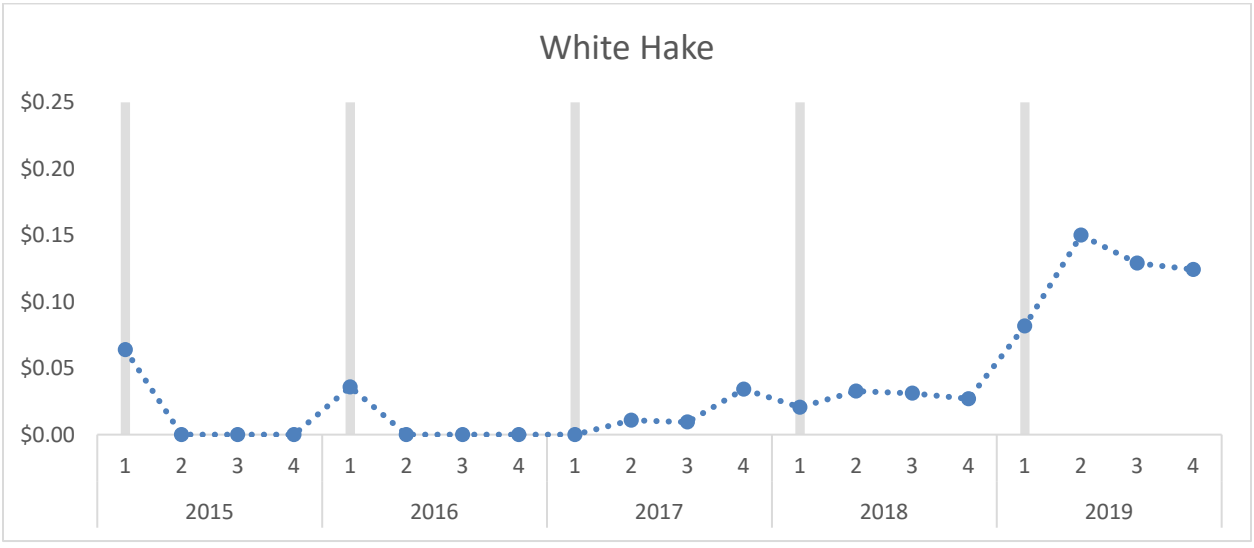
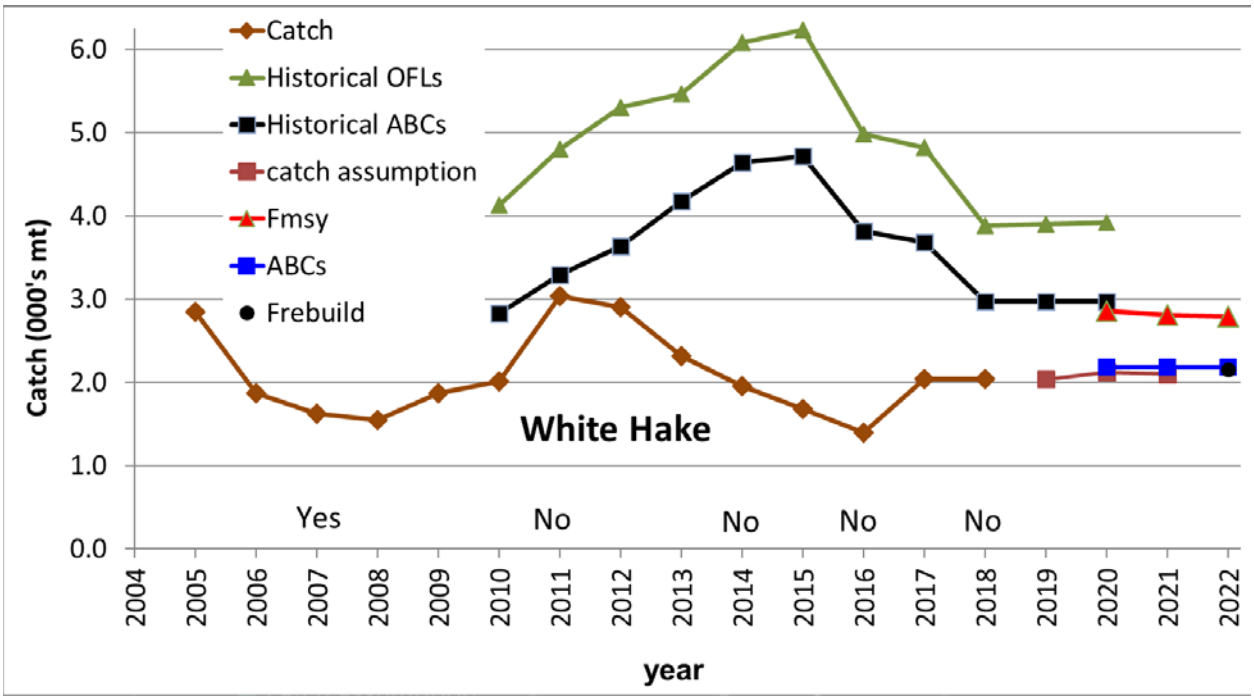


Figure 4- Catch performance for white hake including catches from CY2005- CY2018, historical OFLs and ABCs since FY2010, CY2019 "bridge year" catch assumption, and projections for FY2020- FY2021 at F_{MSY} and 75%F_{MSY} or FY20202 at $F_{rebuild}$. Overfishing status in the terminal year of the assessment indicated on the x-axis ("Yes" = overfishing, "No" = not overfishing, and "Unk" = unknown overfishing status).



Estimated CY 2020 White Hake Total Catch (mt)

Stock	**Total Catch**	Groundfish Fishery	Sector	Common Pool	Recreational	Midwater Trawl Herring Fishery	Scallop Fishery	Small Mesh Fisheries	State Water	Other
	A to H	A+B+C	A	B	C	D	E	F	G	H
White Hake	2031.6	2002.2	2001.9	0.3					0.5	28.9

Sector and common pool catch estimates used FY19 and FY20 year-end DMIS data

Recreational catch estimates based on "new" MRIP data

State water landings based on CY20 landings from CFDBS database as of August 2, 2021

State water discard estimates based on FY19 estimated total discards of 0.8 mt for the three stocks.

Other sub-component catch estimates used FY19 and FY20 year-end DMIS data

Values in metric tons of live weight

Sector and common pool include estimate of missing dealer reports

Any value for a non-allocated species may include landings of that stock or misreporting of species and/or stock area. These are northern windowpane, southern windowpane, ocean pout, halibut, and wolffish.

Source: NMFS Greater Atlantic Regional Fisheries Office

August 4, 2021, run date of July 2, 2021

These data are the best available to NOAA's National Marine Fisheries Service (NMFS). Data sources for this report include: (1) Vessels via VMS; (2) Vessels via vessel logbook reports; (3) Dealers via Dealer Electronic reporting; (4) Observers and at-sea monitors via the Northeast Fisheries Observer Program. Differences with previous reports are due to corrections made to the database.