



New England Fishery Management Council

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Eric Reid, *Chair* | Thomas A. Nies, *Executive Director*

MEMORANDUM

DATE: November 4, 2022
TO: Scientific and Statistical Committee
CC: Groundfish Committee
FROM: Groundfish Plan Development Team
SUBJECT: **Possible overfishing limits and acceptable biological catches for three groundfish stocks, fishing years 2023 through 2025**

The Groundfish Plan Development Team (PDT) met on October 19, 2022 and November 2, 2022 by webinar and discussed three groundfish stocks: Southern New England/Mid-Atlantic (SNE/MA) yellowtail flounder, Cape Cod/Gulf of Maine (CC/GOM) yellowtail flounder, and white hake.

The most recent stock assessments of SNE/MA yellowtail flounder, CC/GOM yellowtail flounder and white hake were management track assessments in the fall of 2022. The peer review for SNE/MA yellowtail flounder and white hake occurred in September of this year. The CC/GOM yellowtail flounder assessment was provided by direct delivery to the PDT and SSC as recommended by the Assessment Oversight Panel (i.e., Level 1 assessment). As such, CC/GOM yellowtail flounder did not undergo a peer review in September.

Rebuilding Status

Table 1 summarizes the rebuilding status for SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, and white hake.

Table 1. Summary of rebuilding status for SNE/MA yellowtail flounder, CC/GOM yellowtail flounder, and white hake, based on the 2022 assessments.

Groundfish Stock	Rebuilding Plan Start of the Current Plan	Planned Rebuilding Date	Years Remaining in Plan, starting with FY2023	Total ACLs exceeded within past three completed FYs?	Has the original rebuilding F been achieved? Or is this unknown?	What is current SSB estimate relative to SSB _{MSY} ? Or is this unknown?
Southern New England/Mid-Atlantic yellowtail flounder*	7/18/2019	2029	6	No	F rebuild (plan start) = 0.243 F ₂₀₂₁ = 0.349	SSB ₂₀₂₁ = 70 mt 4% SSB _{MSY}
Cape Cod/Gulf of Maine yellowtail flounder*	5/1/2004	2023	0	No	F rebuild (plan start) = 0.26 F ₂₀₂₁ = 0.1035	SSB ₂₀₂₁ = 3,058 mt 100% SSB _{MSY}
White hake	5/1/2004	2031	8	No	F rebuild (plan start) = 0.117 F ₂₀₂₁ = 0.1605	SSB ₂₀₂₁ = 19,497 mt 69% SSB _{MSY}

*Research track assessment scheduled for November 2024 for yellowtail flounder stocks

Summary by Groundfish Stock

1. Southern New England/ Mid-Atlantic Yellowtail Flounder

Stock Status:

The 2022 peer review panel concluded SNE/MA yellowtail flounder is overfished and overfishing is not occurring. The stock is in a rebuilding plan, with a 72% probability of rebuilding by 2029 under $F_{\text{rebuild}} = 70\%F_{\text{MSY}}$.

Key Points:

Retrospective adjustments were made to the model results. Main sources of uncertainty in this assessment include long-term reference points assuming recruitment has remained within the range observed since 1990 and issues fitting the catchability (q) survey biomass from the Cooperative Research comparative chain sweep experiment to the model.

Projections:

Table 2 provides possible OFLs and ABCs for FY2023-FY2025 for SNE/MA yellowtail flounder. ABC projections were conducted at 70% F_{MSY} . Table 3 provides a sensitivity projection, with 70% F_{MSY} in year one held constant. Updated projections at 70% F_{MSY} indicate the stock may rebuild by 2028 (the rebuilding plan end date is 2029). See Table 4 and Figure 1 for a summary.

The 2022 peer review panel expressed concern the out-year catch advice is overly optimistic given the stock’s current biomass and observed failure to recruit and stated the increase seems to be fueled by low fishing pressure and simulated recruitment. The PDT recommends the SSC consider a constant ABC for this stock given concerns raised by panel. Furthermore, the PDT is concerned that the short-term and rebuilding projections are very optimistic given previous experience with this stock. Therefore, the PDT recommends the sensitivity projection, which would result in a constant ABC of 40 mt.

The PDT cautions the OFL in 2025 (345 mt) under the sensitivity projection requires further consideration by the SSC to determine if that value is appropriate for this stock. Other possibilities for an OFL discussed by the PDT included maintaining the OFL as a constant (55 mt) for all three years or from 2024 into 2025 (89 mt). Alternatively, another option the PDT discussed was maintaining the FY2024 OFL (89 mt) and ABC (64 mt) under 70%FMSY constant for FY2025.

Table 2. Possible OFLs and ABCs (mt) for FY2023-2025 for SNE/MA yellowtail flounder, using 70%FMSY for the ABCs.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	55	40
2024	89	64
2025	161	116

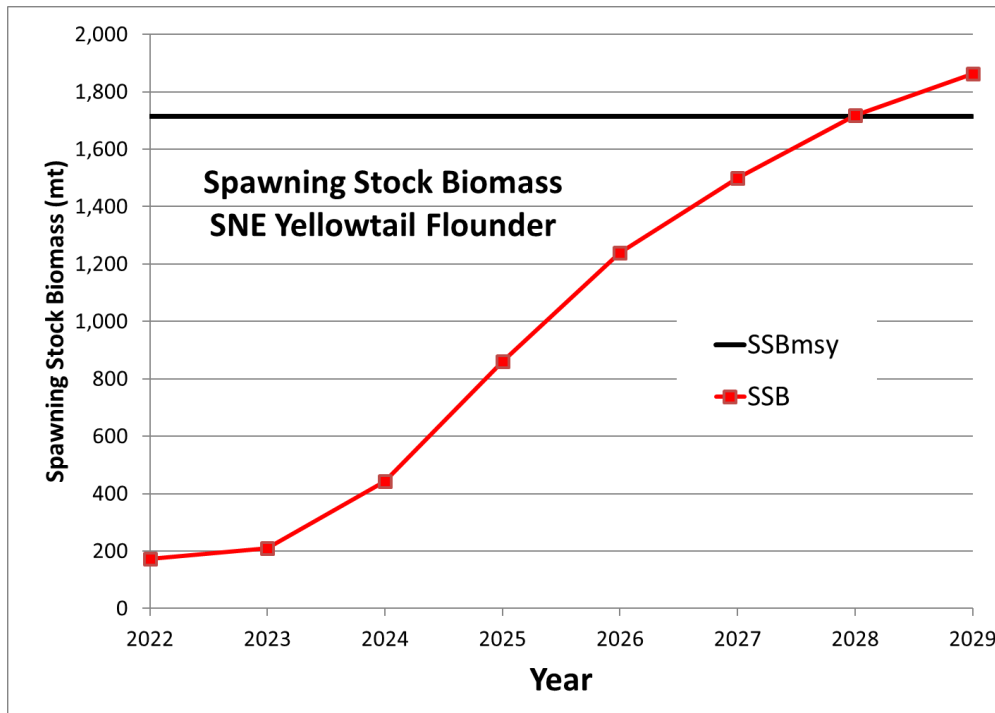
Table 3. Sensitivity projection for OFLs and ABCs (mt) for FY2023-2025 for SNE/MA yellowtail flounder, using 70%FMSY in year one for ABCs held constant.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	55	40
2024	89	40
2025	345	40

Table 4. Rebuilding projection at 70%Fmsy ($F_{rebuild}$) for SNE/MA yellowtail flounder.

Year	Probability	
	SSB	SSB > SSBmsy
2022	174	0.00
2023	210	0.00
2024	444	0.00
2025	861	0.05
2026	1,238	0.22
2027	1,499	0.36
2028	1,718	0.50
2029	1,862	0.59

Figure 1. Rebuilding projection at 70%Fmsy ($F_{rebuild}$) for SNE/MA yellowtail flounder.



Catch Performance:

Figure 2 and Table 5 summarize catch performance and changes in overfishing status for SNE/MA yellowtail flounder.

Figure 2. Catch performance for SNE/MA yellowtail flounder including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and FMSY and 70%FMSY for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis (“No” = not overfishing).

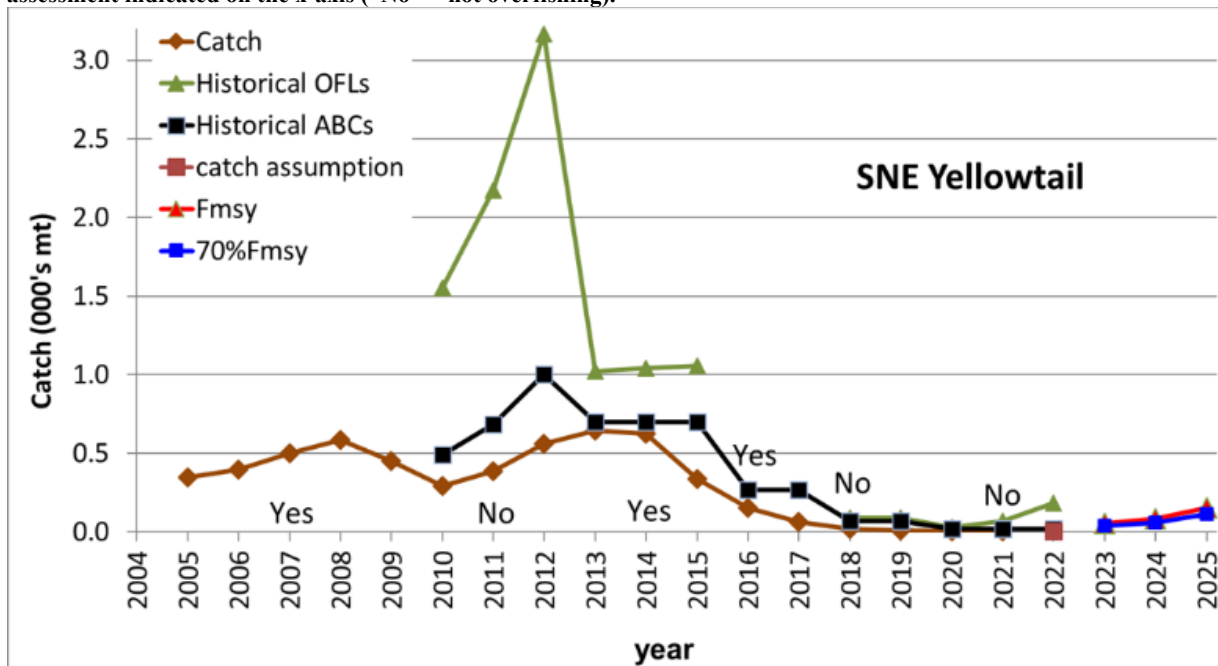


Table 5. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and ABCs for FY2023-FY2025 for SNE/MA yellowtail flounder.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F _{MSY}	70%F _{MSY}
2010	291	1,553	493			
2011	388	2,174	687			
2012	563	3,166	1,003			
2013	646	1,021	700			
2014	625	1,042	700			
2015	337	1,056	700			
2016	152	undefined	267			
2017	64	undefined	267			
2018	19	90	68			
2019	8	90	68			
2020	7	31	22			
2021	5	71	22			
2022			22	4		
2023					55	40
2024					84	64
2025					152	116

Additional Fishery Information:

Commercial Fishery –Figure 3 shows commercial groundfish (sector and common pool) catch of SNE/MA yellowtail flounder since FY2018 along with the FY2022 commercial ACL. In 2018 there was seasonality to SNE/MA yellowtail flounder utilization by the commercial groundfish fishery, but with the drastic decline in utilization since 2019 this trend has disappeared.

Table 6 compares the performance of the QCM since FY2012 to the realized outcomes for SNE/MA yellowtail flounder. The QCM has over-predicted catch, utilization, and revenue since 2013. Consistent model over-predictions can be explained in part by downward trends in catch/revenue. Since the QCM is drawing from trips two FYs prior to the FY being predicted, fishery conditions/resource availability for SNE/MA yellowtail have been changing between these FYs. ACE lease prices for SNE/MA yellowtail flounder were estimated for fishing years 2017-2021 using a hedonic price model (Figure 4). Input data into the model is comprised of inter-sector ACE leases over the FY2017-2021 period. Lease prices have been \$0.00/lb since the end of FY2018. There was a spike during the first quarter of FY2018 to \$3.00/lb which was likely due to anticipated high utilization, though this lease price was based off a very small number of inter-sector trades. The anticipated quota scarcity, based off the large sector sub-ACL decrease in FY2018 (Table 6Table 5), ultimately did not materialize.

Figure 3. In-season utilization of SNE/MA yellowtail flounder by the commercial (sectors and common pool) groundfish

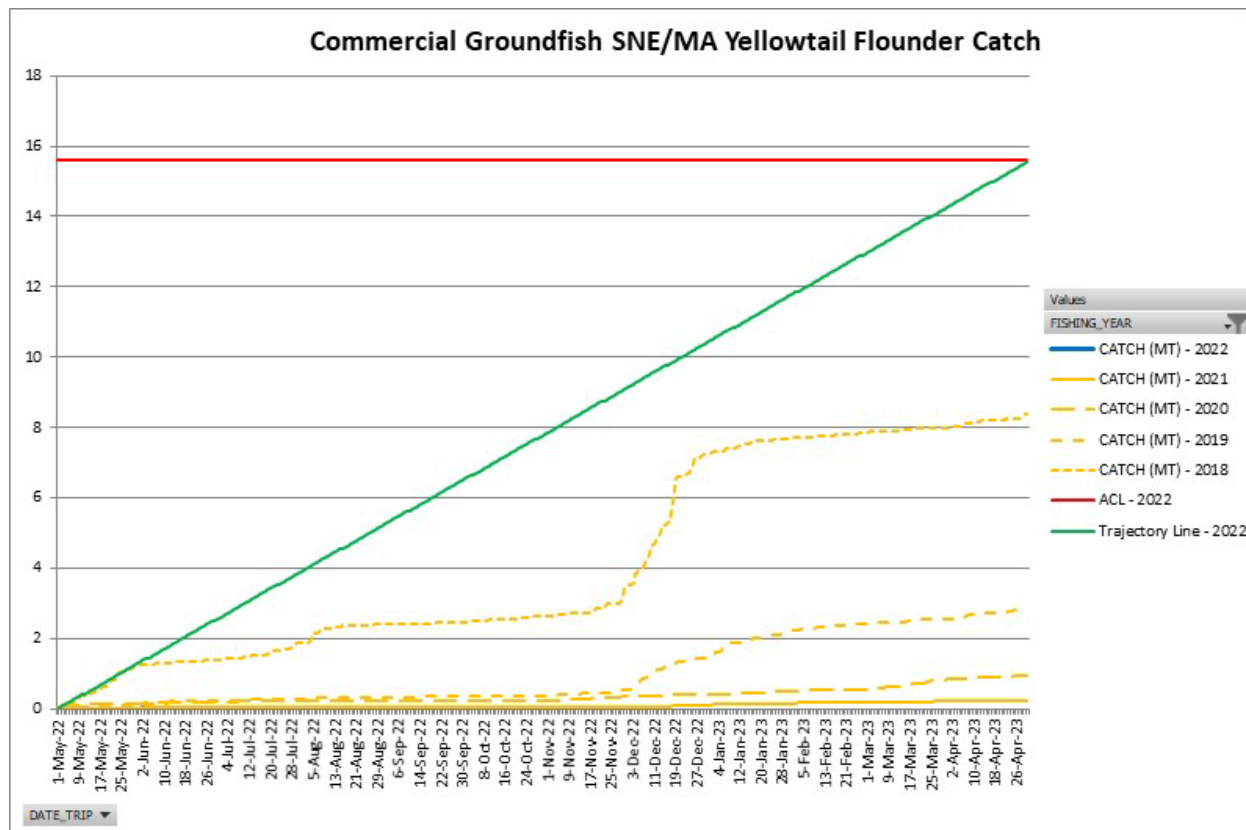
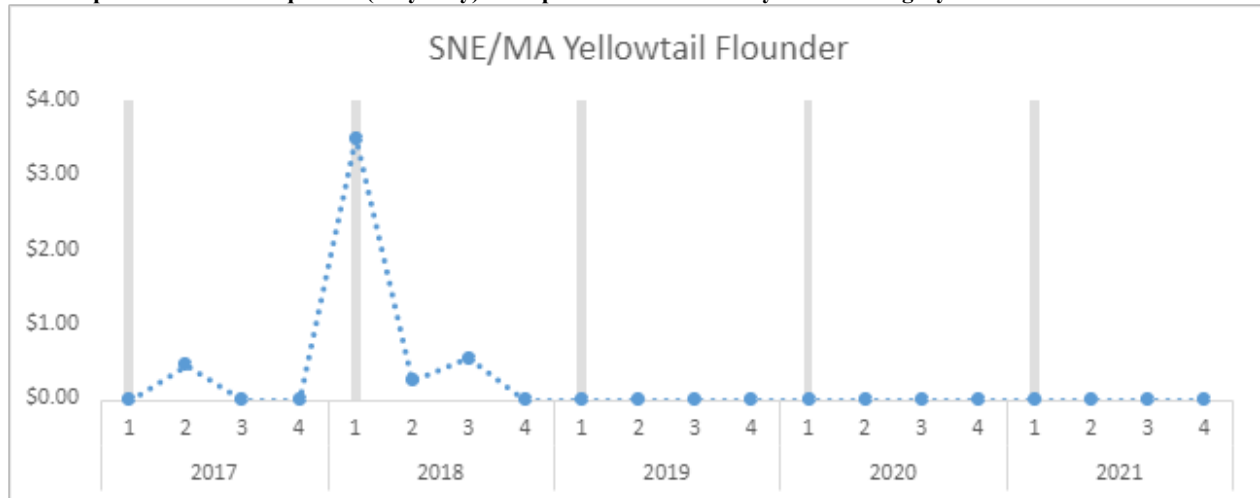


Table 6. SNE/MA yellowtail flounder stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021\$).

FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev (\$mil, 2021)	
		Realized	Predicted	Realized	Predicted	Realized	Predicted
2012	607	426	148	0.70	0.20	1.7	0.1
2013	488	282	455	0.58	0.88	1.3	1.6
2014	462	313	450	0.68	1.00	1.3	1.7
2015	460	174	457	0.38	1.00	0.8	1.6
2016	169	45	138	0.26	0.95	0.3	0.4
2017	176	11	120	0.06	0.77	0.1	0.3
2018	35	7	34	0.20	1.00	0.0	0.1
2019	36	3	16	0.07	0.61	0.0	0.1
2020	13	1	12	0.07	1.00	0.0	0.0
2021	12	0.2	3	0.02	0.25	0.0	0.0

Figure 4. Inter-sector ACE lease prices estimated for SNE/MA yellowtail flounder for fishing years 2017-2021 using a hedonic price model. First quarter (May-July) lease prices are indicated by the vertical gray bars.



Sea Scallop Fishery -The sea scallop fishery has a sub-ACL for SNE/MA yellowtail flounder. Presently, the sub-ACL is determined at 90% of the Scallop PDT’s projected catch for the fishery, which was set at 2 mt for FY2020-FY2022. In FY2021, the scallop fishery caught 58.2% of its sub-ACL (1.2 mt out of 2 mt). An updated analysis for Scallop FW34 last year by the Scallop PDT indicated the fishery may exceed the sub-ACL by 1 mt in FY2022. There are uncertainties in the bycatch projection estimates and the scallop fishery may realize values greater than or less than those projected. The preliminary in-season GARFO catch report indicates only 4.3% of the sub-ACL has been caught in FY2022.

AMs can be triggered under certain conditions, and these AMs would require gear modifications in a subsequent year following an overage. If the SNE/MA yellowtail flounder sub-ACL is exceeded by 50% or more (or if the scallop sub-ACL is exceeded by any amount and total catch exceeds the overall ACL), accountability measures that implement area-based gear restrictions on the scallop fishery may be triggered. The scallop fishery has exceeded its sub-ACL three times in the last ten years (2013, 2017, and 2019).

2. Cape Cod/Gulf of Maine yellowtail flounder

Stock Status:

Based on the 2022 stock assessment report, CC/GOM yellowtail flounder is not overfished and overfishing is not occurring, which is the same stock status as the previous 2019 assessment. CC/GOM yellowtail flounder is in a rebuilding plan with an end date of 2023, and the 2022 stock assessment indicates the stock is rebuilt in 2021 and continues to be in the projections.

Key Points:

Retrospective adjustments were made to the model results. This has caused uncertainty in the assessment and population projections – as more years of data are added there is a decrease in the spawning stock biomass (SSB) estimate and an increase in the fishing mortality (F) estimate.

Projections:

Table 7 provides possible OFLs and ABCs for FY2023-FY2025 for CC/GOM yellowtail flounder. ABC projections were conducted at 75% FMSY. The PDT also provides sensitivity ABC projections at 70%FMSY (Table 8) and 60%FMSY (Table 9) in case the SSC decides to

set ABCs lower to increase the likelihood the stock remains rebuilt. Long-term projections under 75%FMSY result in an initial increase in catch and SSB and a subsequent fishing-down of the stock, with long-term catch reaching an asymptote at 928 mt (Figure 5).

Table 7. Possible OFLs and ABCs (mt) for FY2023-2025 for CC/GOM yellowtail flounder, using 75%FMSY for the ABCs.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	1,436	1,115
2024	1,279	992
2025	1,184	915

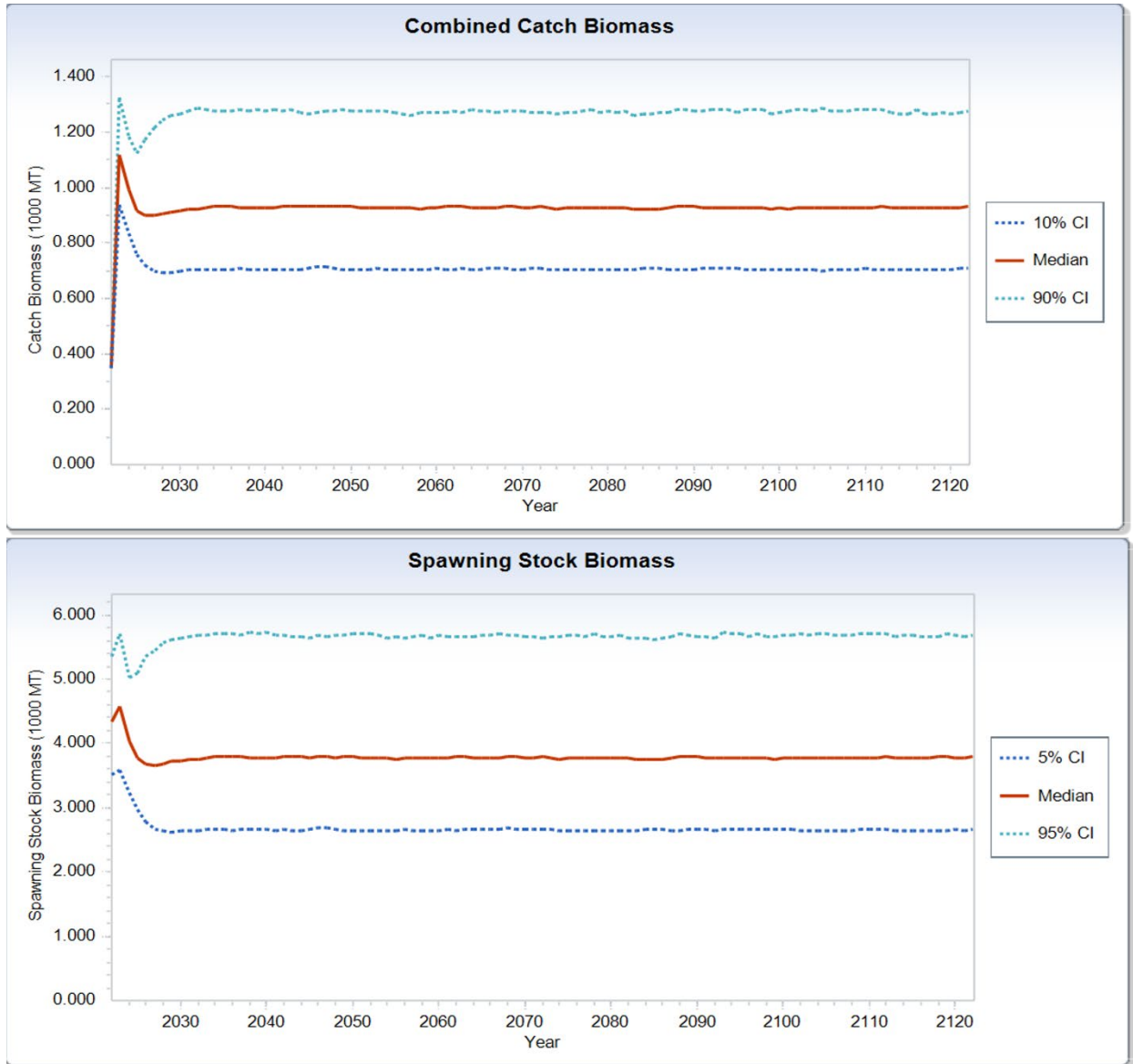
Table 8. Sensitivity ABCs (mt) for FY2023-2025 for CC/GOM yellowtail flounder, using 70%FMSY..

Fishing Year	Possible ABC (mt)
2023	1,048
2024	943
2025	878

Table 9. Sensitivity ABCs (mt) for FY2023-2025 for CC/GOM yellowtail flounder, using 60%FMSY.

Fishing Year	Possible ABC (mt)
2023	911
2024	841
2025	799

Figure 5. Long-term catch and SSB projections for CC/GOM yellowtail flounder at 75%FMSY.



Catch Performance:

Figure 6 and Table 10 summarize catch performance and changes in overfishing status for CC/GOM yellowtail flounder.

Figure 6. Catch performance for CC/GOM including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and F_{MSY} and $75\%F_{MSY}$ for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis (“No” = not overfishing).

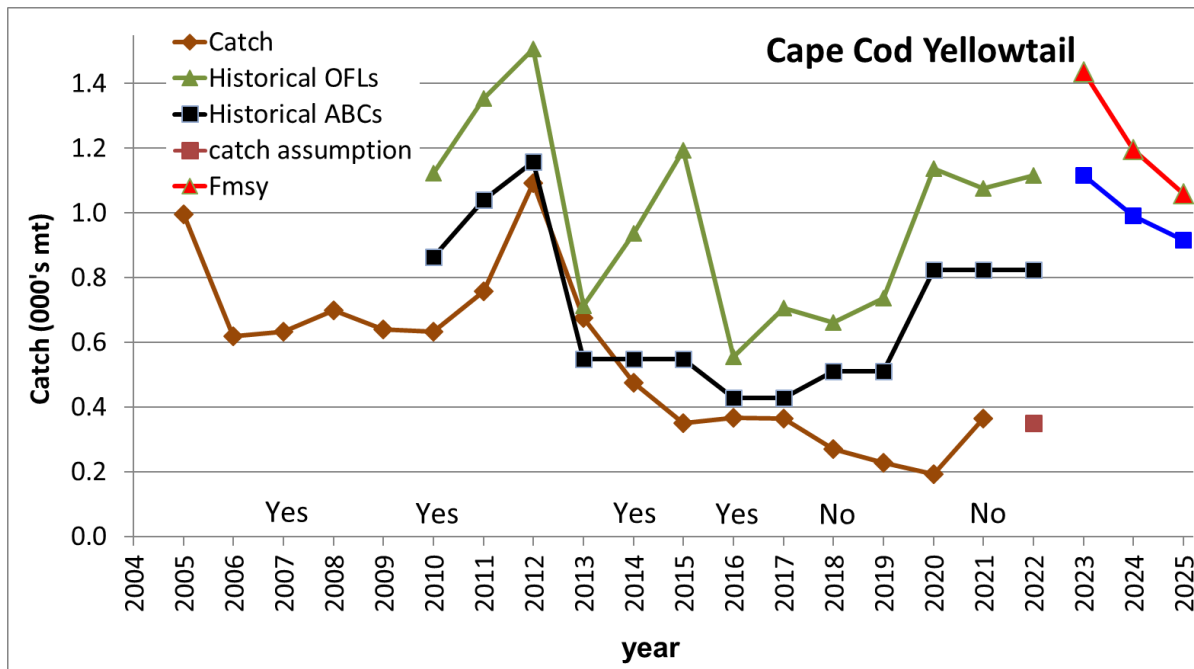


Table 10. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and ABCs for FY2023-FY2025 for CC/GOM yellowtail flounder.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F_{MSY}	$75\%F_{MSY}$
2010	633	1,124	863			
2011	758	1,355	1,041			
2012	1,092	1,508	1,159			
2013	676	713	548			
2014	475	936	548			
2015	351	1,194	548			
2016	368	555	427			
2017	365	707	427			
2018	271	662	511			
2019	228	736	511			
2020	192	1,136	823			
2021	365	1,076	823			
2022		1,116	823	350		
2023					1,436	1,115
2024					1,197	992
2025					1,059	915

Additional Fishery Information:

Commercial fishery - Figure 7 shows commercial groundfish (sector and common pool) catch of CC/GOM yellowtail flounder since FY2018 with the FY2022 commercial ACL. Utilization of the stock has been low in recent years and the current catch is below the sub-ACL trajectory for FY2022.

Table 11 compares the performance of the QCM since FY2012 to realized outcomes for CC/GOM yellowtail flounder. The model was over-predicting catch and utilization from FY2017-2019 but under-predicted in FY2021. Inter-sector ACE lease prices for CC/GOM yellowtail flounder were estimated for FY2017-2021 using a hedonic price model (Figure 8). In FY2017 and FY2018, ACE lease prices were high in the first part of the fishing year and declined to zero by quarter four, but lease prices were at or near \$0.00/lb for all of FY2020 and 2021.

Figure 7. In-season utilization of CC/GOM yellowtail flounder by the commercial (sectors and common pool) groundfish

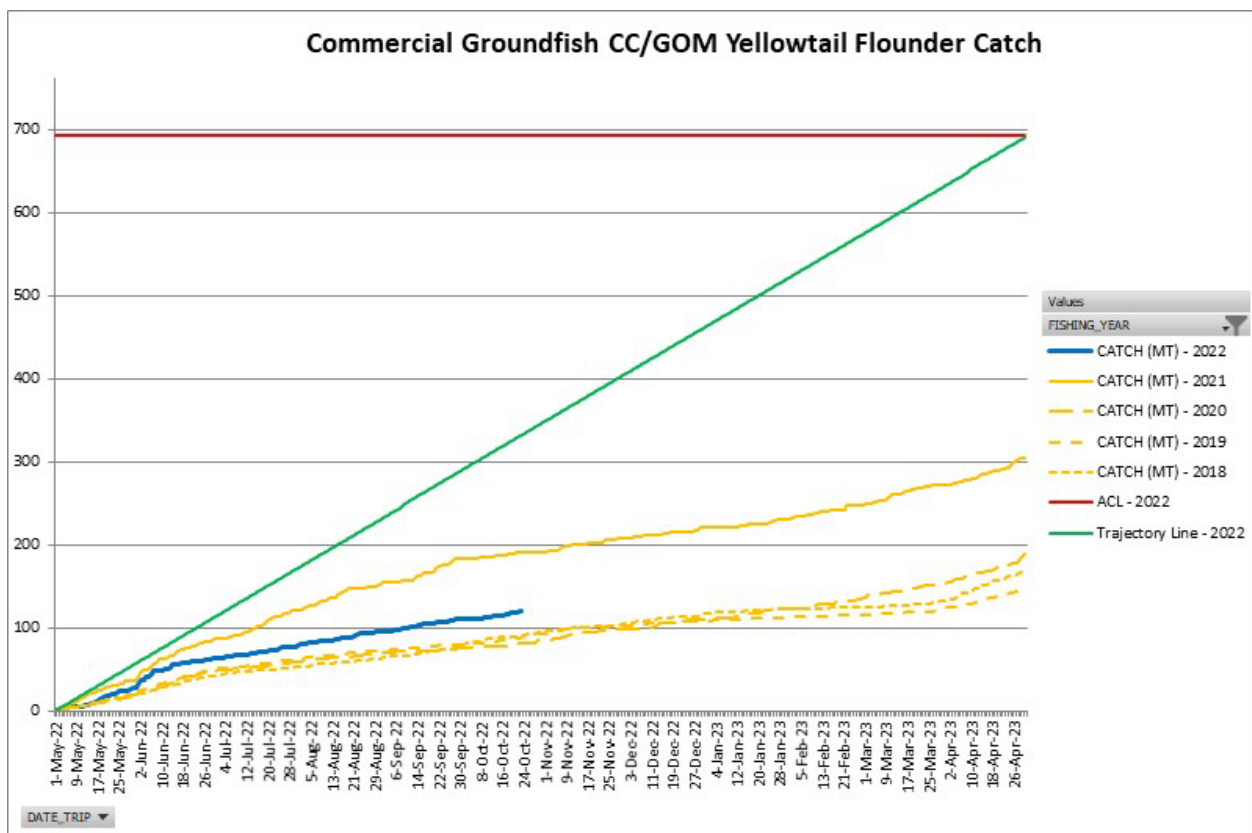
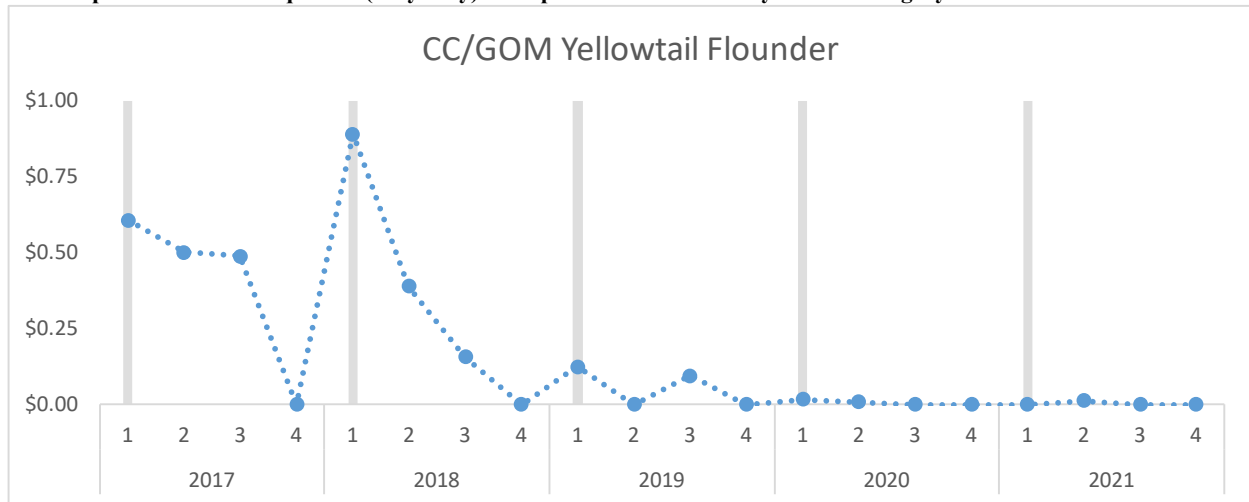


Table 11. CC/GOM yellowtail flounder stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021\$).

FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev (\$mil, 2021)	
		Realized	Predicted	Realized	Predicted	Realized	Predicted
2012	1021	954	391	0.94	0.33	3.1	0.6
2013	466	377	423	0.81	0.74	1.3	1.4
2014	463	249	338	0.54	0.72	0.7	1.1
2015	437	372	204	0.85	0.46	1.2	0.7
2016	327	249	177	0.76	0.54	1.0	0.6
2017	326	196	237	0.60	0.73	0.7	0.9
2018	381	165	380	0.43	1.00	0.4	1.4
2019	377	141	282	0.37	0.74	0.3	0.8
2020	656	182	178	0.28	0.27	0.3	0.4
2021	651	284	124	0.44	0.19	0.5	0.3

Figure 8. Inter-sector ACE lease prices estimated for CC/GOM yellowtail flounder for fishing years 2017-2021 using a hedonic price model. First quarter (May-July) lease prices are indicated by the vertical gray bars.



3. White hake

Stock Status:

The 2022 peer review panel concluded white hake is not overfished and overfishing is not occurring. The assessment indicates a change in overfished status from the previous 2019 assessment which determined white hake was overfished¹. White hake is under a rebuilding plan that defines $F_{rebuild}$ as $70\%F_{MSY}$.

Key Points:

Retrospective adjustments were made to the model results. Main sources of uncertainty in this assessment include catch and numbers-at-age not being well characterized (partially due to potential misidentification), low sampling, no commercial catch-at-age data prior to 1989, and bias resulting from dealers culling extra-large fish out of the large category starting in 2003 (an extra-large market category wasn't established until 2014).

¹ NMFS has not made a formal change of status determination at this time.

Short-term projections for OFL and ABC determinations are based on sampling from a cumulative distribution function of recruitment estimates from ASAP from 1995-2019. The peer review panel noted a recruitment time series reaching back to 1995 may be inappropriate.

Projections:

Table 12 provides possible OFLs and ABCs for FY2023-FY2025 for white hake. ABC projections were conducted at 70% FMSY.

Short term catch advice for estimating ABCs and OFLs are made using projections that assume a more recent time series (1995-2019) of lower estimates of recruitment in the near term but rebuilding projections were developed for white hake using projections that resample recruitment from the entire times series (1963-2016) of the assessment. Projections under 70%FMSY were conducted using both the short-term projections and rebuilding plan biological reference points (BRP) (Figure 9). The projection based on the rebuilding plan BRP with a longer recruitment time series indicates the stock can rebuild by 2031, but projections using the stock assessment recruitment time series do not (Figure 10).

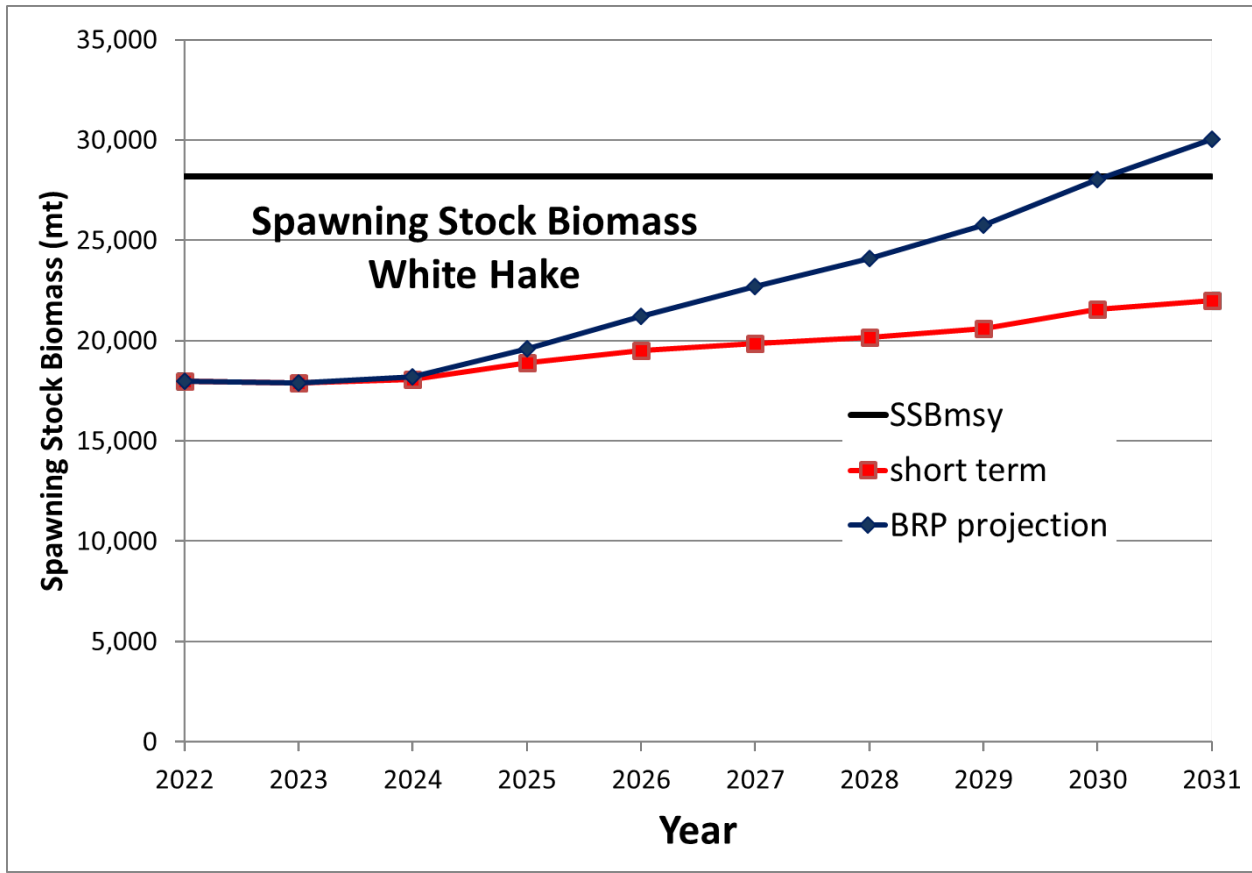
Table 12. Possible OFLs and ABCs (mt) for FY2023-2025 for white hake, using 70%FMSY for the ABCs.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	2,650	1,897
2024	2,645	1,892
2025	2,753	1,968

Figure 9. SSB projections for white hake using the stock assessment recruitment time series (1995-2019) and rebuilding-plan BRP recruitment time series (1963-2016)

Year	short term projection SSB	BRP projection SSB	BRP projection Probability SSB > SSBmsy
2022	17,978	17,978	0.00
2023	17,880	17,893	0.00
2024	18,066	18,200	0.00
2025	18,888	19,574	0.00
2026	19,498	21,226	0.00
2027	19,859	22,682	0.03
2028	20,153	24,096	0.11
2029	20,609	25,755	0.25
2030	21,556	28,046	0.48
2031	21,992	30,039	0.67

Figure 10. SSB projections for white hake using the stock assessment recruitment time series (1995-2019) and rebuilding-plan BRP recruitment time series (1963-2016)



Catch Performance:

Figure 11 and Table 13 summarize catch performance and changes in overfishing status for white hake.

Figure 11. Catch performance for white hake including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and F_{MSY} and 70% F_{MSY} constant catch estimate for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis (“No” = not overfishing).

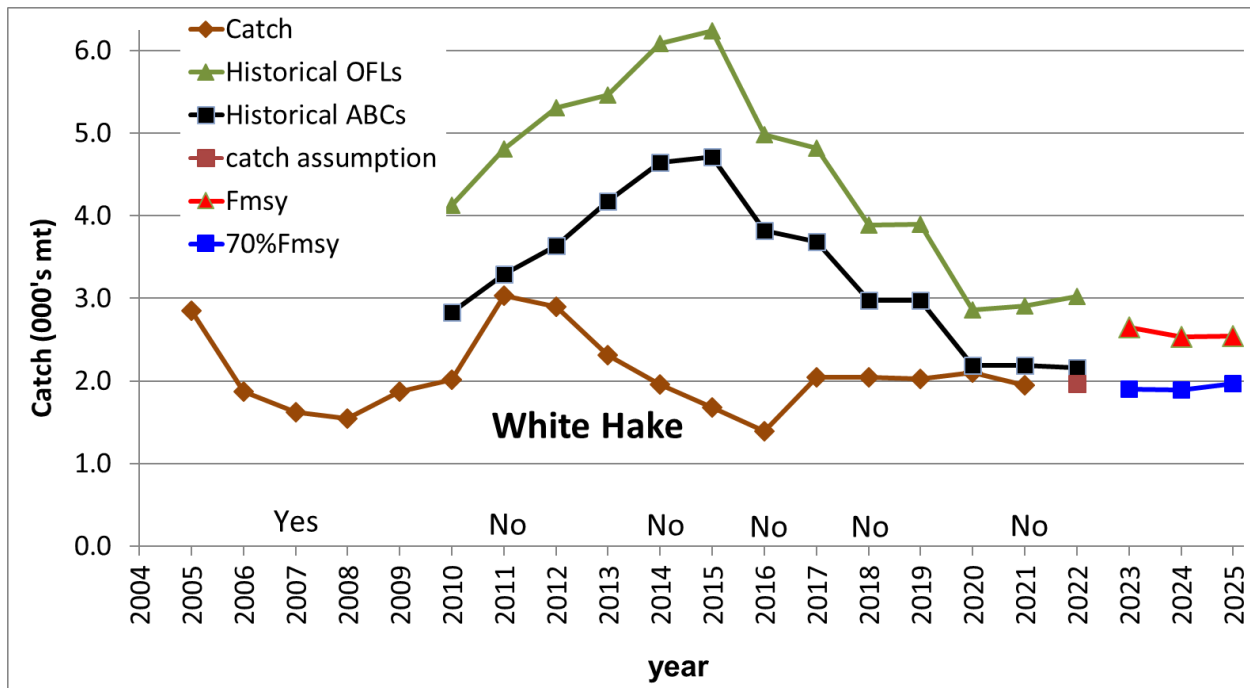


Table 13. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and ABCs for FY2023-FY2025 for white hake.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F_{MSY}	70% F_{MSY}
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	2,029	3,898	2,971			
2020	2,104	2,857	2,186			
2021	1,951	2,906	2,186			
2022		3,022	2,155	1,964		
2023					2,650	1,897
2024					2,535	1,892
2025					2,547	1,968

Additional Fishery Information:

Commercial Fishery – Figure 12 shows commercial groundfish (sector and common pool) catch of white hake since FY2018 along with the FY2022 commercial ACL. Exploitation in FY2022 is trending similar to what it has been in the last four years.

Table 14 compares the performance of the QCM since FY2012 to the realized outcomes for white hake. The QCM has relatively closely predicted catch, utilization, and revenue since 2013, except for in 2019 when catch was overpredicted by almost 650 mt and utilization by 24%. ACE lease prices for white hake were estimated for FY2017-2021 using a hedonic price model (Figure 13). Input data into the model is comprised of inter-sector ACE leases over the FY2017-2021 period. Lease prices have been increasing since the start of FY2019 as white hake has become more constraining. Lease prices also show seasonality and generally increase over the course of the fishing year.

Figure 12. In-season utilization of white hake by the commercial (sectors and common pool) groundfish

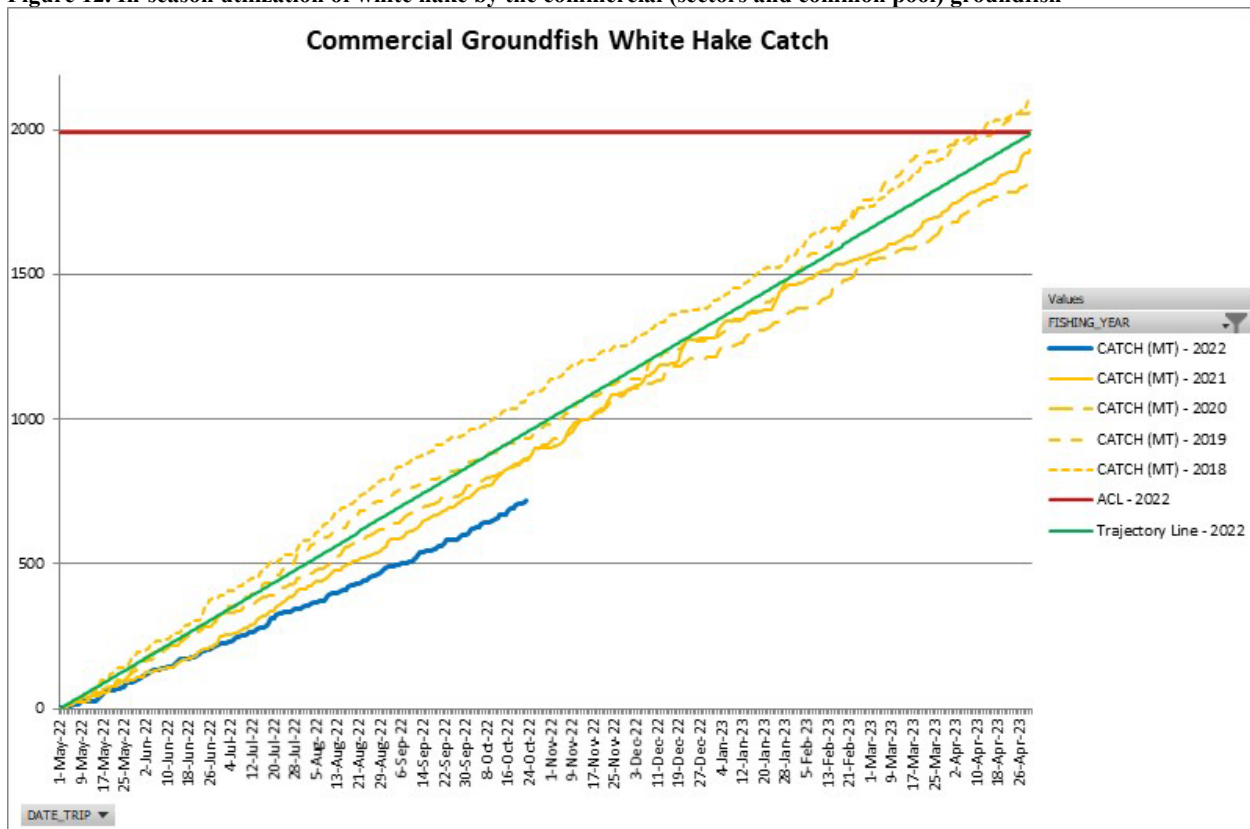


Table 14. White hake stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021\$).

FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev (\$mil, 2021)		
		Realized	Predicted	Realized	Predicted	Realized	Predicted	
2012	3,257	2,414	1,980	0.74	0.43	8.2	5.1	
2013	4,142	2,025	2,570	0.49	0.70	6.7	7.2	
2014	4,308	1,721	1,932	0.40	0.45	6.4	6.5	
2015	4,313	1,581	1,689	0.37	0.39	5.5	5.7	
White Hake	2016	3,434	1,432	1,780	0.42	0.52	4.9	6.3
	2017	3,333	2,014	2,071	0.60	0.62	4.9	7.2
	2018	2,713	2,083	1,907	0.77	0.7	4.7	6.2
	2019	2,715	2,044	2,691	0.75	0.99	4.4	6.2
	2020	2,004	1,790	1,839	0.89	0.92	4.6	4.2
	2021	1,994	1,930	1,995	0.97	1.00	5.8	4.0

Figure 13. Inter-sector ACE lease prices estimated for white hake for fishing years 2017-2021 using a hedonic price model. First quarter (May-July) lease prices are indicated by the vertical gray bars.

