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

MEMORANDUM

DATE: November 4, 2022 (Version 2, Updated from October 21, 2022)

TO: Scientific and Statistical Committee

CC: Groundfish Committee

FROM: Groundfish Plan Development Team

SUBJECT: **Possible overfishing limits and acceptable biological catches for seven groundfish stocks, fishing years 2023 through 2025**

The Groundfish Plan Development Team (PDT) met on October 19, 2022, by webinar and discussed the recent fall 2022 stock assessments and peer review for seven groundfish stocks, including: Georges Bank (GB) haddock, Gulf of Maine (GOM) haddock, GB winter flounder, GOM winter flounder, American plaice, pollock, and Atlantic halibut. The PDT includes two appendices to its memo: Appendix 1- Bridge-year catch estimates for CY2022 and Appendix 2- Summary of recreational fishery performance and management measures for GOM haddock.

Rebuilding Status

Table 1 summarizes the rebuilding status for GB winter flounder and Atlantic halibut.

Table 1. Summary of rebuilding status for GB winter flounder and Atlantic halibut, 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 SSBMSY? Or is this unknown?
Georges Bank Winter Flounder	7/18/2019	2029	7	No	$F_{rebuild}$ (plan start) = 0.365 F_{2021} = 0.076	SSB_{2021} = 4,503 mt 60% SSB_{MSY}
Atlantic Halibut	5/1/2004	2055	33	Yes, 102.9% of the total ACL in FY 2019	Unknown	Unknown

Summary by Groundfish Stock

1. Georges Bank haddock

Stock Status:
2022 peer review panel concluded GB haddock is not overfished and overfishing is not occurring.

Key Points:
No retrospective adjustments were made to the model results. Main sources of uncertainty in this assessment include dynamics in the plus group (particularly with the 2013 year class), the magnitude of the 2020 and 2021 year classes, and future assumptions about weights and selectivity at age.

This stock has produced several exceptionally strong year classes in the last 20 years, leading to record high SSB in the last decade. As the strong year classes age out of the population, abundance has returned to levels last observed in the early 2000s, which could potentially lead to an increase in weights at age as growth is released from density-dependent pressures.

GB haddock includes a transboundary Eastern GB haddock management unit which is jointly managed with Canada under the United States/Canada Resource Sharing Understanding.

Projections:
Table 2 provides possible OFLs and ABCs for FY2023- FY2025 for GB haddock. ABC projections conducted at 75%F_{MSY}.

Table 2. Possible OFLs and ABCs (mt) for FY2023- FY2025 for GB haddock, using 75%FMSY for the ABCs.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	18,482	14,221
2024	17,768	13,958
2025	15,096	12,282

Catch Performance:
Figure 2 and Figure 3 summarize catch performance and changes in overfishing status for GB haddock.

Figure 1. Catch performance for GB haddock including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and FMSY and 75%FMSY for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis ("No" = not overfishing).

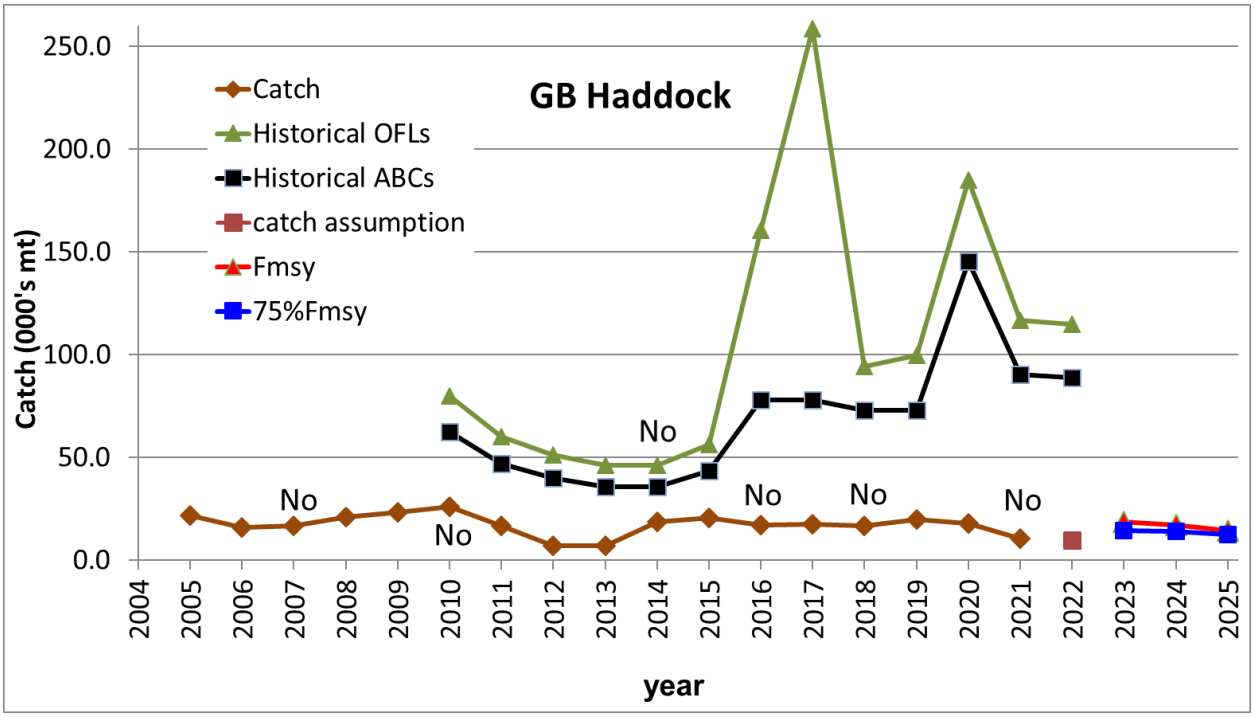


Table 3. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and FMSY and 75% FMSY estimates for FY2023-FY2025 for GB haddock.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F_{MSY}	$75\%F_{MSY}$
2010	25,903	80,007	62,515			
2011	16,670	59,948	46,784			
2012	6,935	51,150	39,846			
2013	6,828	46,185	35,783			
2014	18,601	46,268	35,699			
2015	20,687	56,293	43,606			
2016	17,274	160,385	77,898			
2017	17,387	258,691	77,898			
2018	16,647	94,274	73,114			
2019	19,719	99,757	73,114			
2020	17,878	184,822	145,367			
2021	10,691	116,883	90,337			
2022		114,925	88,856	9,914		
2023					18,482	14,221
2024					17,287	13,958
2025					14,555	12,282

Additional Fishery Information:

Commercial Fishery – Figure 2 and Figure 3 show commercial groundfish (sector and common pool) catch of GB haddock since FY2018 along with the FY2022 commercial ACL. Utilization

by the commercial groundfish fishery is very low and has been slightly lower than in past years. ACE lease prices have been $0, which is logical given the low utilization rate.

Table 4 compares the performance of the Quota Change Model (QCM) since FY2012 to the realized outcomes for Eastern GB haddock and Table 5 for Western GB haddock. In recent years, the model has under-predicted catch and utilization in some years and over-predicted in other years. EGB haddock makes up a small component of overall GB haddock catch and revenue. For WGB haddock, the model has under-predicted catch and utilization in some years and over-predicted in other years. The model over-predicted revenue for several years from FY2015-2017, which was due to the influence of low quota cost trips targeting haddock, pollock, and redfish. Since then, the model accounts for this by using a maximum value for the probability of selection of these types of trips. Of note, there was a large increase in both realized catch and revenue in FY2020.

Figure 2. In-season utilization of GB haddock by the commercial (sectors and common pool) groundfish fishery.

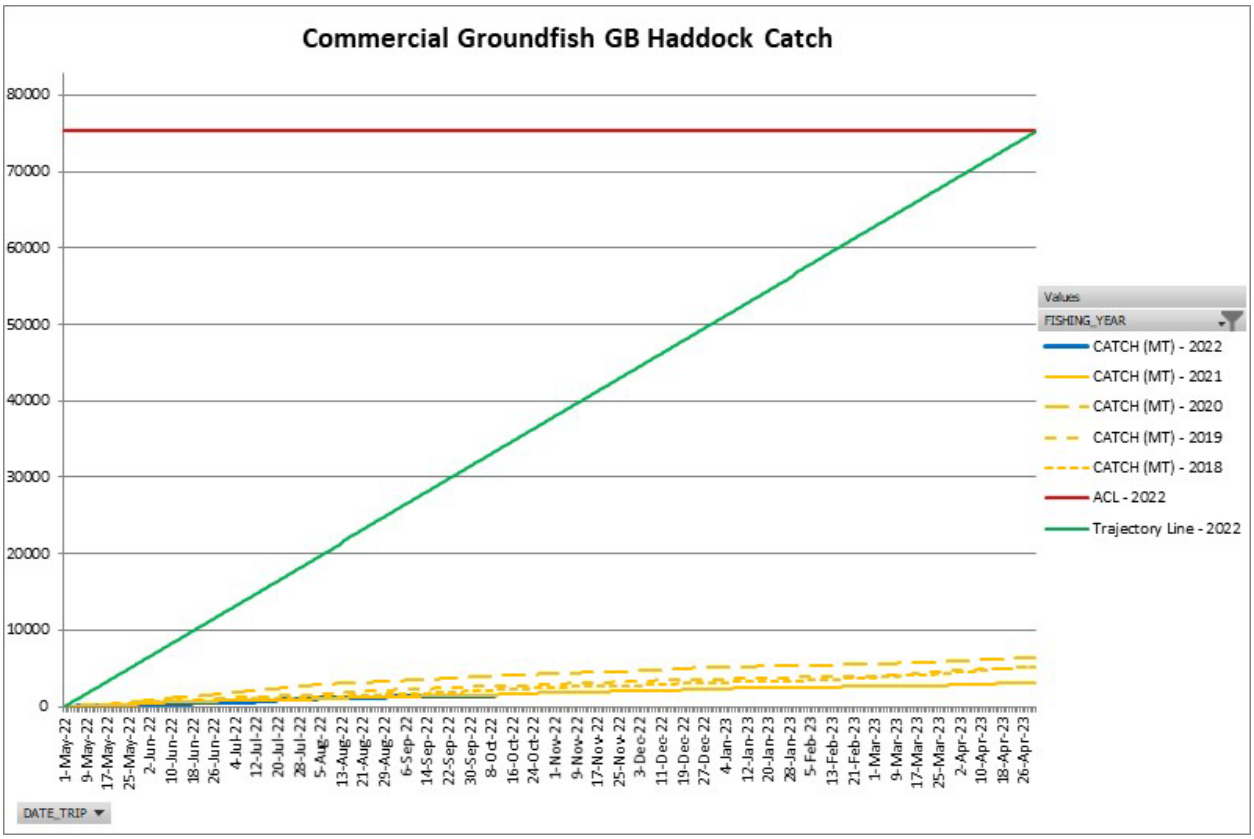


Figure 3. In-season utilization of GB haddock by the commercial (sectors and common pool) groundfish fishery, as a closer view.

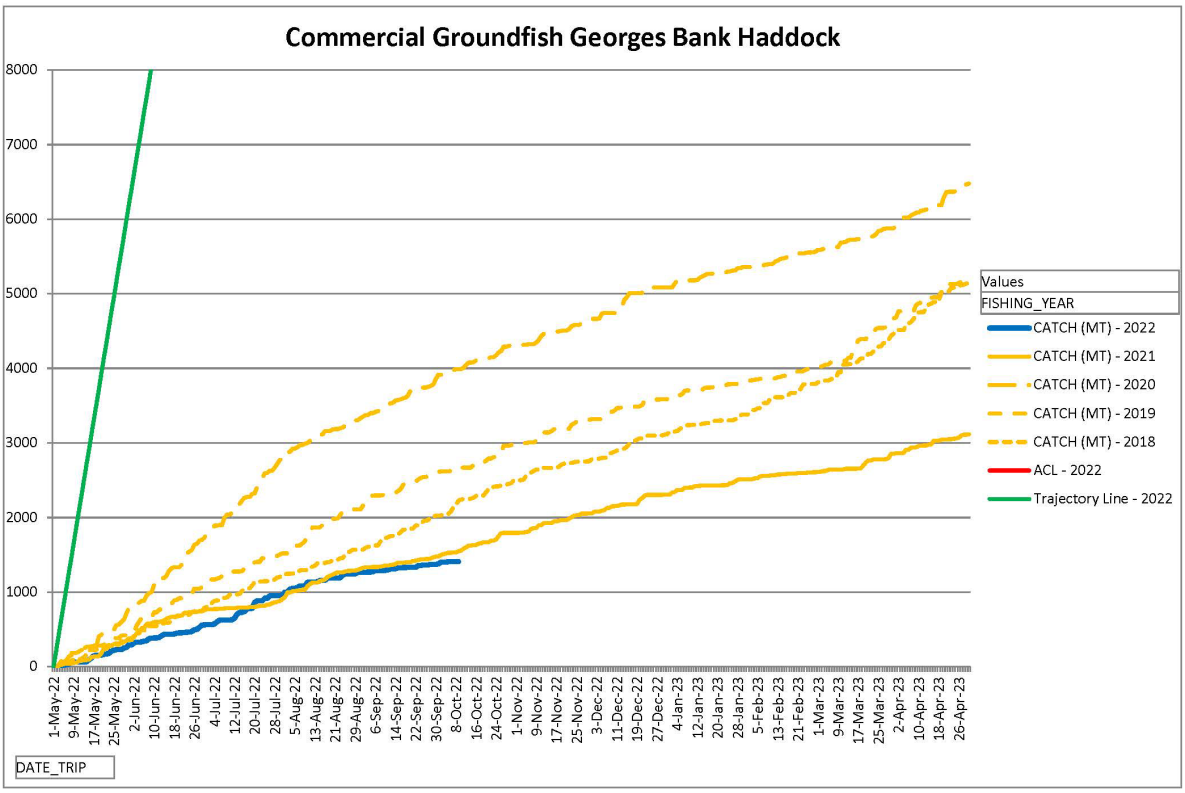


Table 4. EGB haddock stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021$).

	FY	Sector sub-ACL	Catch (mt)		*Utilization (%)*		Gross Rev ($mil, 2021)	
			Realized	Predicted	*Realized*	*Predicted*	Realized	Predicted
GB Haddock East	2012	6,861	366	N/A	*0.05*	*N/A*	1.4	N/A
	2013	3,742	579	566	*0.16*	*0.14*	1.5	2.2
	2014	9,454	1,536	365	*0.16*	*0.04*	3.9	1.4
	2015	15,045	1,058	1,107	*0.07*	*0.20*	2.3	3.1
	2016	15,063	549	1,574	*0.04*	*0.09*	1.2	3.7
	2017	29,288	407	1,016	*0.01*	*0.03*	0.7	2.2
	2018	15,488	623	618	*0.04*	*0.04*	1.1	1.4
	2019	14,762	716	464	*0.05*	*0.03*	1.3	0.7
	2020	15,861	563	692	*0.04*	*0.04*	1.1	1.2
	2021	6,267	443	481	*0.07*	*0.08*	1.2	0.9

Table 5. WGB haddock 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
GB Haddock West	2012	19,251	626	N/A	*0.03*	*N/A*	3.3	N/A
	2013	24,908	2,167	1,185	*0.09*	*0.05*	6.7	5.0
	2014	18,666	3,523	793	*0.19*	*0.04*	9.8	3.2
	2015	16,206	3,293	4,495	*0.20*	*0.28*	8.8	12.9
	2016	34,156	3,006	4,511	*0.09*	*0.13*	8.2	10.7
	2017	22,968	3,208	4,787	*0.14*	*0.21*	6.8	10.9
	2018	28,857	4,135	3,628	*0.14*	*0.13*	8.3	7.8
	2019	38,003	4,368	4,160	*0.11*	*0.11*	9.7	7.5
	2020	103,849	5,783	4,426	*0.06*	*0.04*	13.1	7.9
	2021	74096	3,116	4425	*0.04*	*0.06*	7.6	9.0

2. Gulf of Maine haddock

Stock Status:
2022 peer review panel concluded GOM haddock is not overfished and overfishing is occurring.

Key Points:
No retrospective adjustments were made to the model results. The main source of uncertainty in this assessment is the faster than expected rate of decline in biomass that has occurred since the last update. Although the last update projected a decline in biomass, the realized decline has been faster than anticipated. This has resulted in a substantial increase in F which is now above the overfishing threshold.

The GOM haddock stock has experienced several large year classes since 2010, particularly the 2013 year class. The stock has recently declined as these large year classes have aged out. The 2020 year class is currently estimated as the second largest on record, however it is still substantially smaller than the 2013 year class and its estimate is highly uncertain. Future stock status will depend on the strength of this and subsequent year classes.

Projections:
Table 6 provides possible OFLs and ABCs for FY2023- FY2025 for GOM haddock. ABC projections conducted at 75%F_{MSY}.

Table 6. Possible OFLs and ABCs (mt) for FY2023- FY2025 for GOM haddock, using 75%FMSY projection.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	2,515	1,936
2024	2,655	2,038
2025	2,627	2,017

Catch Performance:
Figure 4 and Table 7 summarize catch performance and changes in overfishing status for GOM haddock.

Figure 4. Catch performance for GOM haddock including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and FMSY and 75%FMSY for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis ("No" = not overfishing, "Yes" = overfishing).

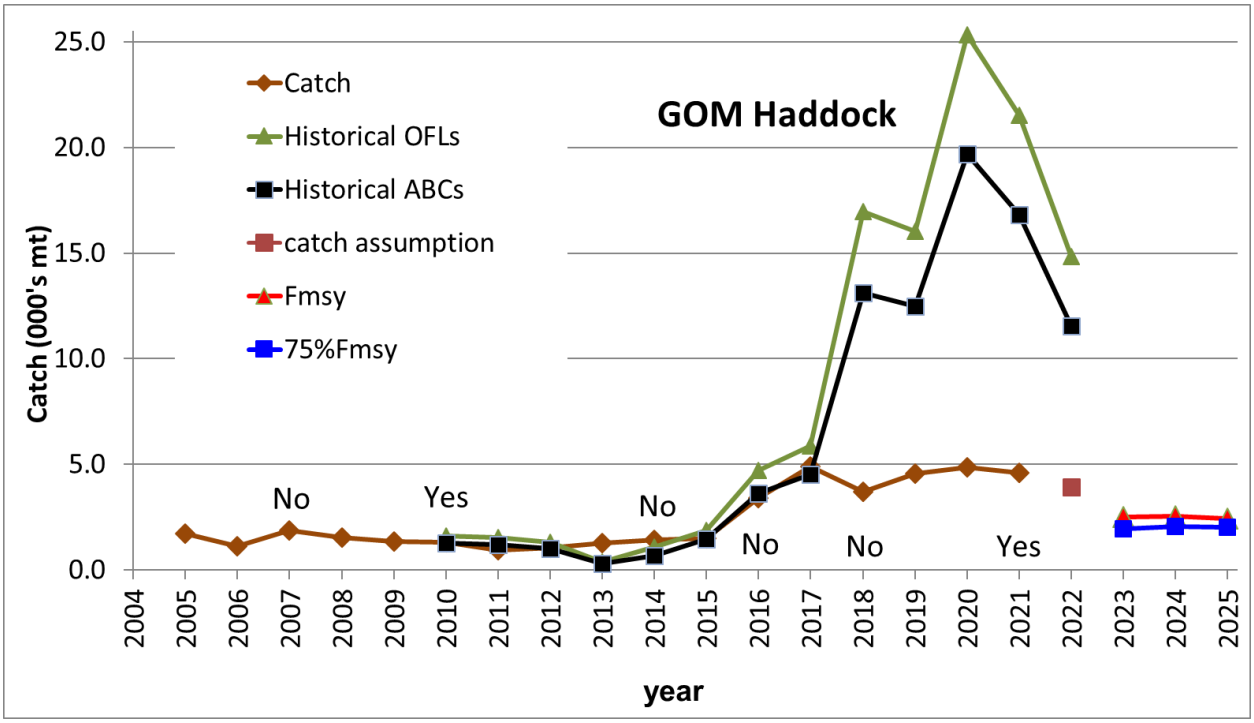


Table 7. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and FMSY and 75% FMSY estimates for FY2023-FY2025 GOM haddock.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F_{MSY}	$75\%F_{MSY}$
2010	1,295	1,617	1,265			
2011	926	1,536	1,206			
2012	1,060	1,296	1,013			
2013	1,277	371	290			
2014	1,410	1,085	677			
2015	1,512	1,871	1,454			
2016	3,406	4,717	3,630			
2017	4,894	5,873	4,534			
2018	3,710	16,954	13,131			
2019	4,542	16,038	12,490			
2020	4,858	25,334	19,696			
2021	4,602	21,521	16,794			
2022		14,834	11,526	3,912		
2023					2,515	1,936
2024					2,552	2,038
2025					2,434	2,017

Additional Fishery Information:

Commercial Fishery – Figure 5 shows commercial groundfish (sector and common pool) catch of GOM haddock since FY2018 along with the FY2022 commercial ACL. Utilization by the commercial groundfish fishery has been similar over time, with a slightly lower trending utilization in the current FY2022. ACE lease prices for GOM haddock have been $0 since FY2018 (Figure 6).

Table 8 compares the performance of the QCM since FY2012 to the realized outcomes for GOM haddock. Since FY2014, the model has under-predicted catch and utilization, likely explained by the increasing trend in quotas and realized catches.

Recreational Fishery – Presently, 33.9% of the GOM haddock ABC is allocated to the recreational fishery. A 7% management uncertainty buffer is applied to determine a recreational sub-ACL. Management measures (fish sizes, seasons, and bag limits) are generally set to achieve but not exceed the recreational sub-ACL. Reactive measures may apply when an overage occurs. See Appendix 2 for a history of recreational management measures and catch performance.

Figure 5. In-season utilization of GOM haddock by the commercial (sectors and common pool) groundfish fishery.

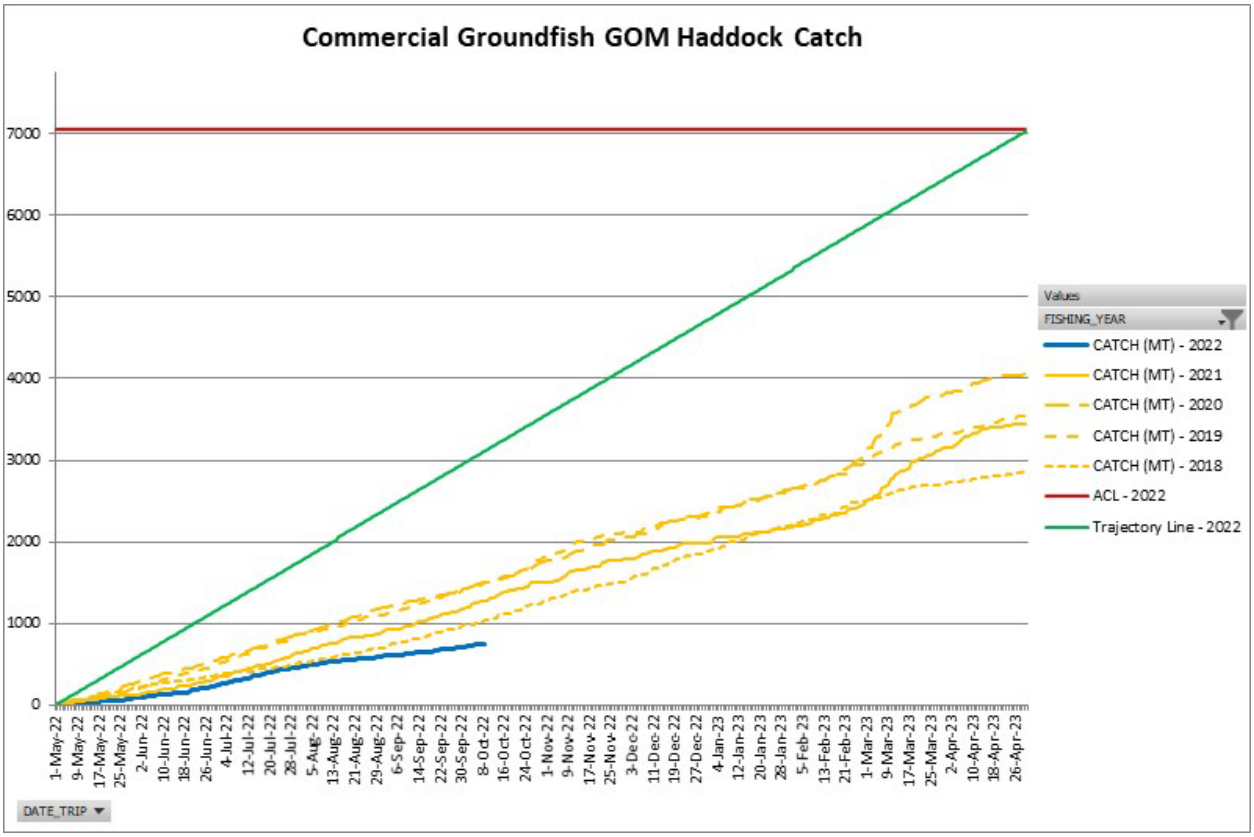


Figure 6. ACE lease prices estimated for GOM haddock for fishing years 2017-2021 using a hedonic price model comprised of inter-sector ACE leases. First quarter (May-July) lease prices are indicated by the vertical gray bars.

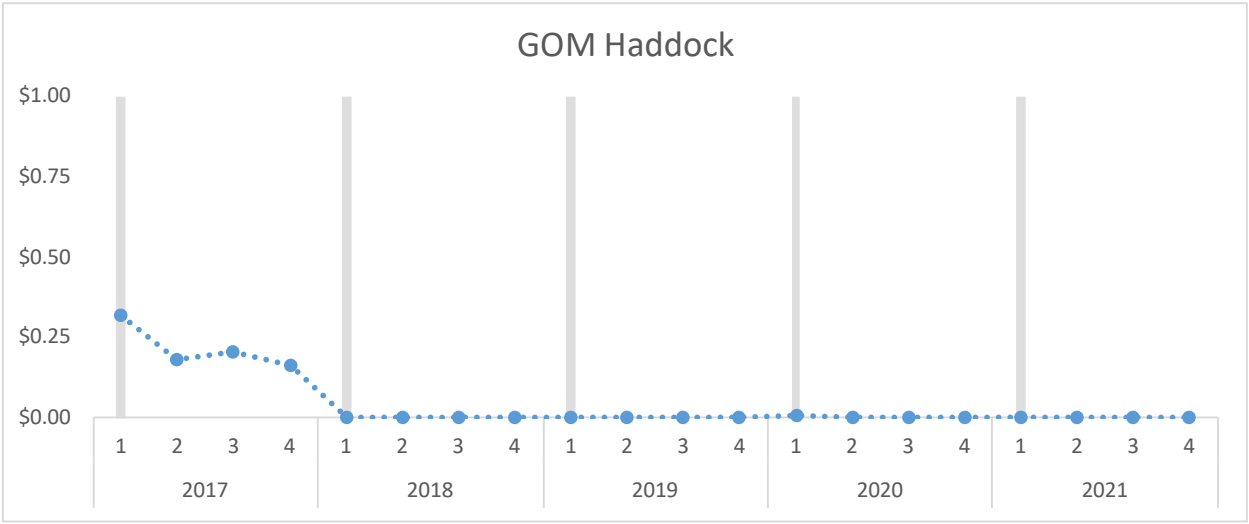


Table 8. GOM haddock stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021$).

	FY	Sector sub-ACL	Catch (mt)		*Utilization (%)*		Gross Rev ($mil, 2021)	
			Realized	Predicted	*Realized*	*Predicted*	Realized	Predicted
GOM Haddock	2012	648	208	308	*0.32*	*0.39*	1.3	0.7
	2013	251	148	224	*0.59*	*0.89*	0.7	1.2
	2014	218	293	167	*1.34*	*0.76*	1.3	0.9
	2015	948	681	124	*0.72*	*0.13*	2.1	0.5
	2016	2,385	1,500	365	*0.63*	*0.15*	4.9	1.1
	2017	2,985	2,161	1,383	*0.72*	*0.46*	5.6	4.1
	2018	8,643	2,791	1,995	*0.32*	*0.23*	6.8	6.1
	2019	8,219	3,452	2,964	*0.42*	*0.36*	8.6	7.2
	2020	11,918	3,992	2,734	*0.33*	*0.23*	10.1	6.4
	2021	10,223	3,447	3,312	*0.34*	*0.33*	11.1	7.7

3. Georges Bank winter flounder

Stock Status:
2022 peer review panel concluded GB winter flounder is not overfished and overfishing is not occurring.

Key Points:
Retrospective adjustments were made to the model results. Main sources of uncertainty in this assessment include the persistent retrospective bias, the estimate of natural mortality, missing 2020 NEFSC surveys and 2022 DFO survey, uncertainties in the catch data particularly for Canadian discards, and lack of length and age composition data for Canadian landings and discards.

This stock shows continued low recruitment at the end of the time series compared to historic values.

Projections:
Table 9 provides possible OFLs and ABCs for FY2023- FY2025 for GB winter flounder, which is in a rebuilding plan, $F_{rebuild} = 70\%F_{MSY}$. Updated projections at 70%FMSY indicate the stock may rebuild by 2027 (the rebuilding plan end date is 2029). See Table 10 and Figure 7 for a summary.

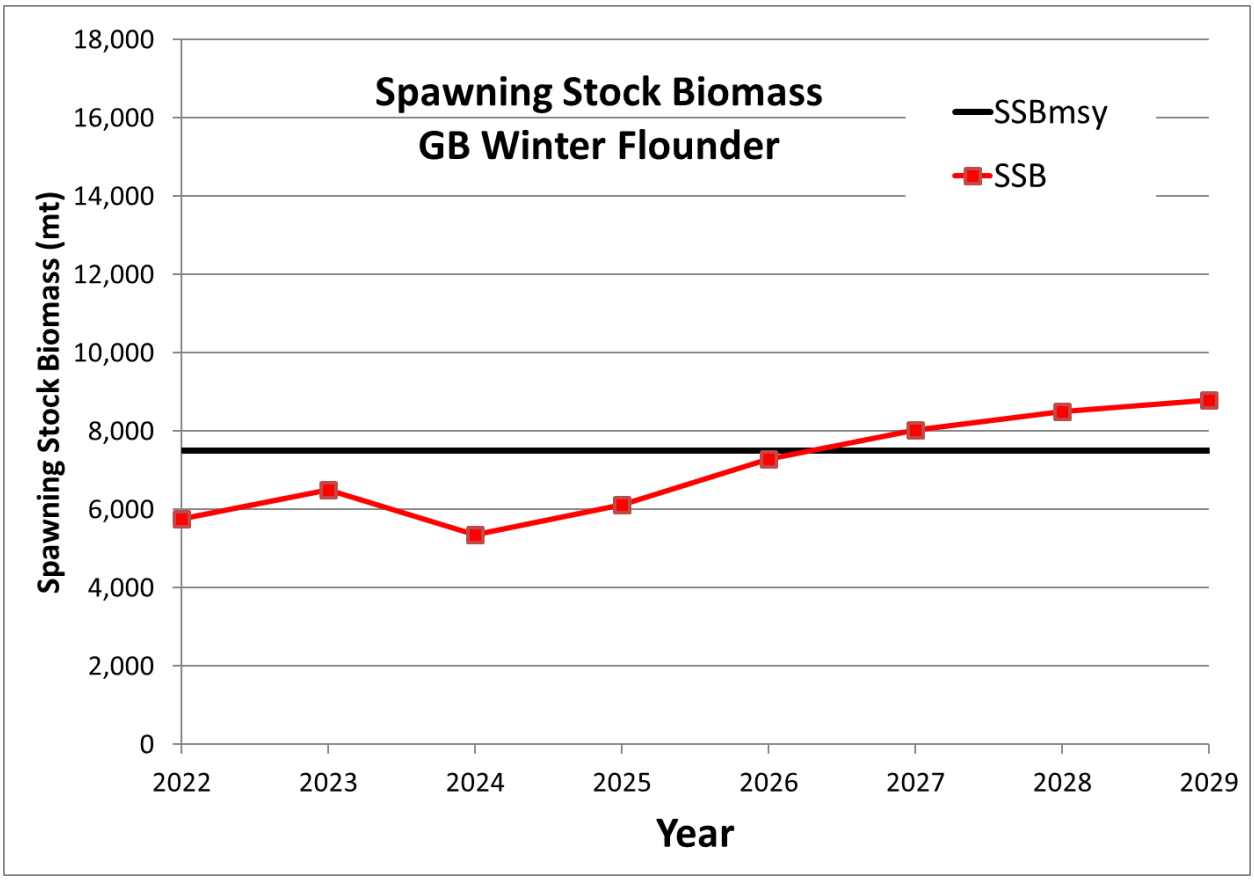
Table 9. Possible OFLs and ABCs (mt) for FY2023- FY2025 for GB winter flounder, with ABCs based on 70%FMSY.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	2,361	1,740
2024	2,153	1,587
2025	2,100	1,528

Table 10. Rebuilding projection at 70%Fmsy (Frebuild) for GB winter flounder.

Year	SSB	Probabilty SSB > SSBmsy
2022	5,756	0.10
2023	6,505	0.31
2024	5,357	0.10
2025	6,111	0.27
2026	7,280	0.46
2027	8,035	0.58
2028	8,507	0.65
2029	8,792	0.69

Figure 7. Rebuilding projection at 70%Fmsy (Frebuild) for GB winter flounder.



Catch Performance:
Figure 8 and Table 11 summarize catch performance and changes in overfishing status for GB winter flounder.

Figure 8. Catch performance for GB winter flounder including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and F40 and 70%F40 for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis ("No" = not overfishing, "Yes" = overfishing).

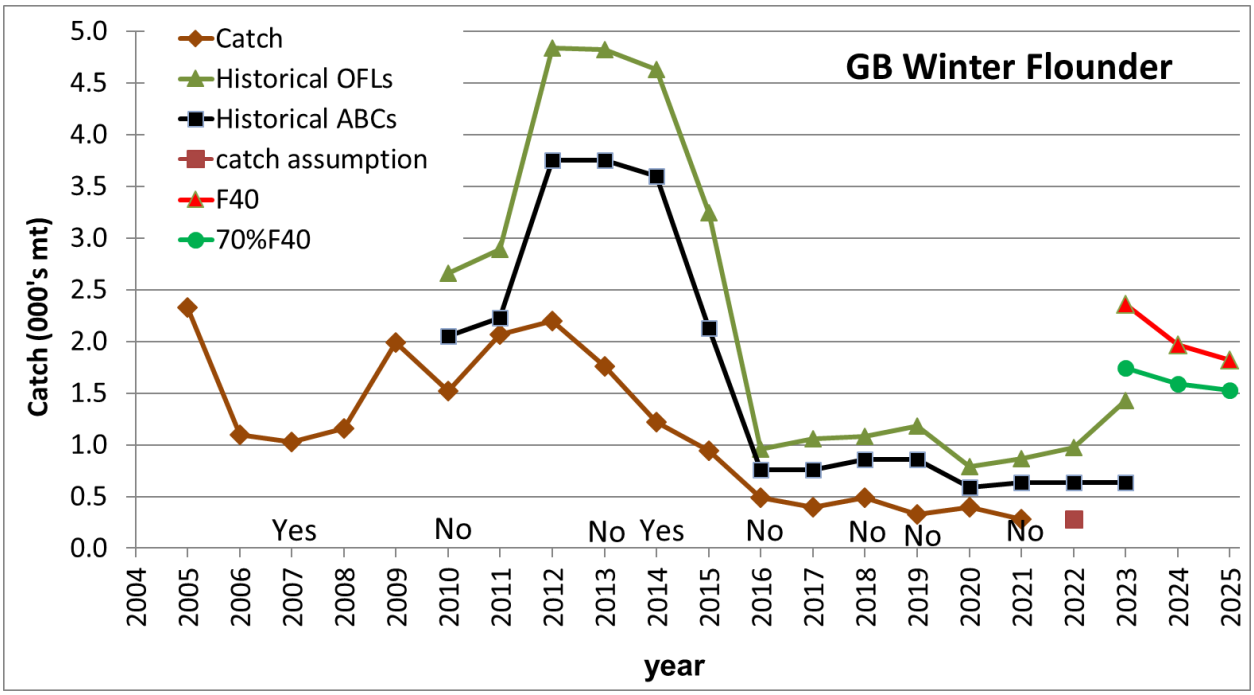


Table 11. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and F40 and 70% F40 estimates for FY2023-FY2025 for GB winter flounder.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F40	70%F40
2010	1,523	2,660	2,052			
2011	2,068	2,886	2,224			
2012	2,199	4,839	3,753			
2013	1,761	4,819	3,750			
2014	1,219	4,626	3,598			
2015	940	3,242	2,124			
2016	492	957	755			
2017	400	1,056	755			
2018	488	1,083	855			
2019	329	1,182	855			
2020	397	790	587			
2021	283	865	634			
2022		974	634	278		
2023		1,431	634		2,361	1,740
2024					1,964	1,587
2025					1,819	1,528

Additional Fishery Information:

Commercial Fishery – Figure 9 shows commercial groundfish (sector and common pool) catch of GB winter flounder since FY2018 along with the FY2022 commercial ACL. This stock shows a strong seasonal trend with utilization dropping off by the second half of the fishing year. ACE lease prices for GB winter flounder reflect this seasonal trend too, with lease prices consistently higher in the first quarters of the fishery year and declining to $0 by quarter 3 or 4 (Figure 10).

Table 12 compares the performance of the QCM since FY2012 to the realized outcomes for GB winter flounder. The model has over-predicted catch and utilization in recent years, likely explained by the declining trend in quotas and realized catches.

Figure 9. In-season utilization of GB winter flounder by the commercial (sectors and common pool) groundfish fishery.

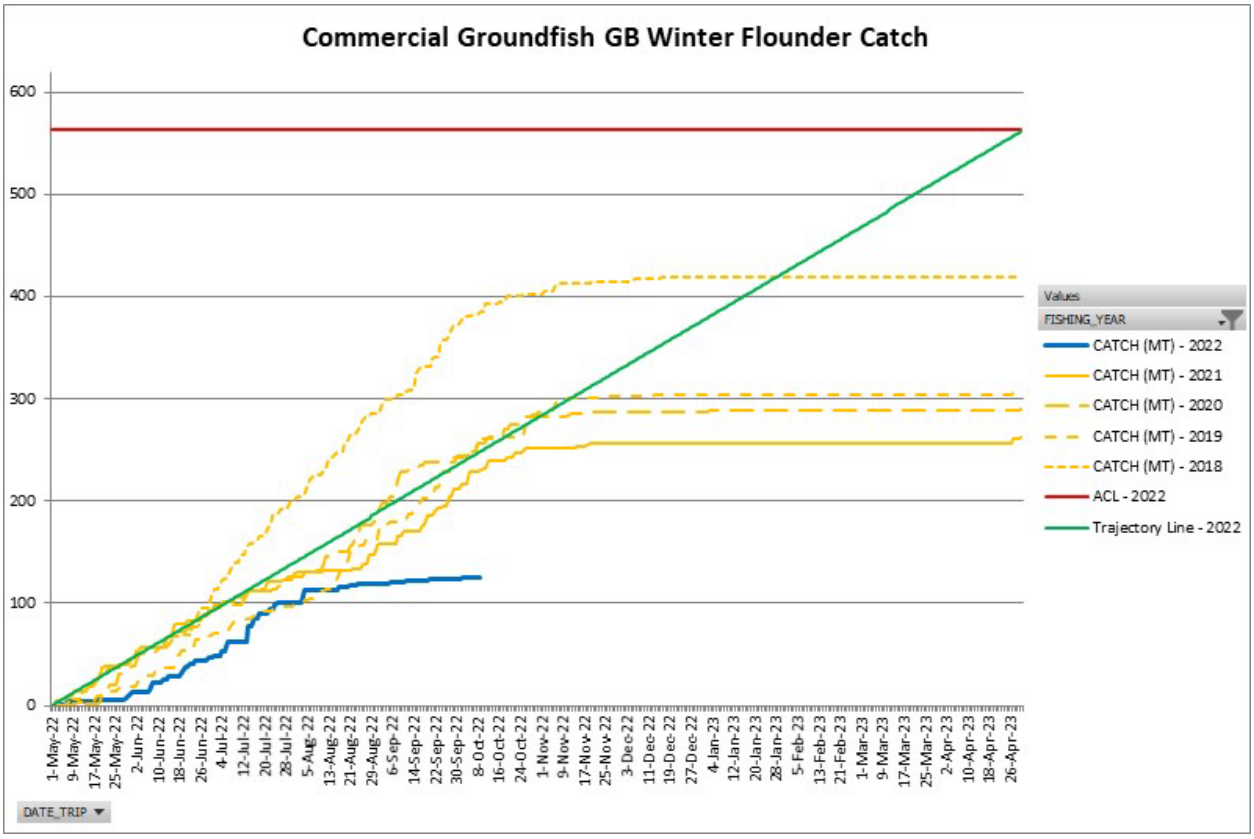


Figure 10. ACE lease prices estimated for GB winter flounder for fishing years 2017-2021 using a hedonic price model comprised of inter-sector ACE leases. First quarter (May-July) lease prices are indicated by the vertical gray bars.

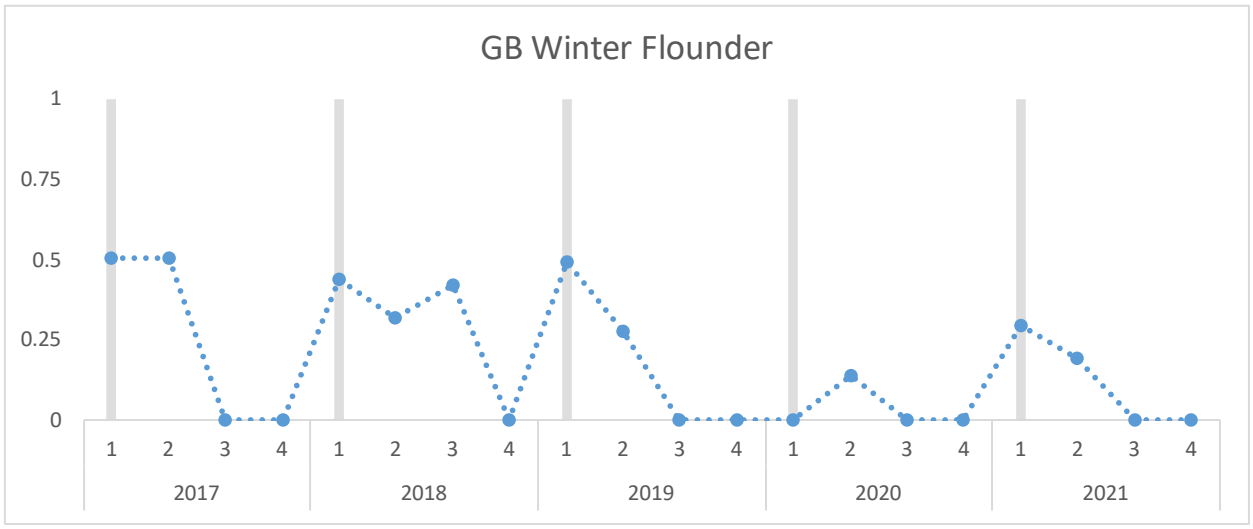


Table 12. GB winter flounder stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021$).

		Sector sub-ACL	Catch (mt)		*Utilization (%)*		Gross Rev ($mil, 2021)	
	FY		Realized	Predicted	*Realized*	*Predicted*	Realized	Predicted
GB Winter Flounder	2012	3367	1931	941	*0.57*	*0.16*	9.9	4.6
	2013	3506	1722	1,780	*0.49*	*0.46*	7.2	9.0
	2014	3356	1149	2,031	*0.34*	*0.60*	5.7	10.3
	2015	1873	869	1,870	*0.46*	*1.00*	4.3	7.9
	2016	585	423	456	*0.72*	*0.78*	3.6	2.8
	2017	615	378	409	*0.61*	*0.66*	3.0	3.1
	2018	725	420	598	*0.58*	*0.83*	3.2	4.9
	2019	742	306	480	*0.41*	*0.63*	2.1	3.7
	2020	502	290	498	*0.58*	*0.99*	1.4	3.7
	2021	517	262	818	*0.51*	*0.31*	1.6	2.7

4. Gulf of Maine winter flounder

Stock Status:
The 2022 peer review panel concluded GOM winter flounder's overfished status is unknown but overfishing is not occurring.

Key Points:
Main sources of uncertainty in this assessment include missing 2020 surveys, the fact that biomass based reference points cannot be determined with this method, and survey gear catchability (q) used in the survey area-swept estimates including state survey q. This

assessment incorporates the use of an updated survey q (average estimate of efficiency from 2009-2021 fall survey and 2009-2022 spring survey).

The general lack of a response in survey indices and age/size structure are the primary sources of concern for this stock with catches remaining far below the overfishing level. Recent increases in the biomass could perhaps be the beginning of a response to removals being at record lows over the last three years (2019-2021). If recent increases in biomass are a response to the low catches then the continuation of keeping catches near recent levels should result in further increases in biomass.

Projections:
Table 13 provides possible OFLs and ABCs for FY2023- FY2025 for GOM winter flounder. The Peer Review Panel suggests that the catch advice should be based on 75% of E40% using the average of 2021 Fall, 2021 Spring and 2022 Spring Surveys (since the 2020 estimates do not exist). Average of 2021 Fall, 2021 Spring and 2022 Spring Surveys X 75%Fmsy (0.17).

Table 13. Possible OFLs and ABCs (mt) for FY2023- FY2025 for GOM winter flounder, based on a constant approach at 75% FMSY for ABCs.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	1,072	804
2024	1,072	804
2025	1,072	804

In addition, the PDT notes the peer review report states:

> *The Panel is **concerned** more about the uncertainty surrounding the rapid increase in catch advice given the stock's depressed condition despite low fishing pressure. These historically low exploitation rates could be leading to the increased projected abundance seen in the most recent surveys, and an increase in effort could cap the stock's nascent recovery.*

Catch Performance:
Figure 11 and Table 14 summarize catch performance and changes in overfishing status for GOM winter flounder.

Figure 11. Catch performance for GOM winter flounder including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and FMSY and 75%FMSY for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis ("No" = not overfishing and "Yes = overfishing").

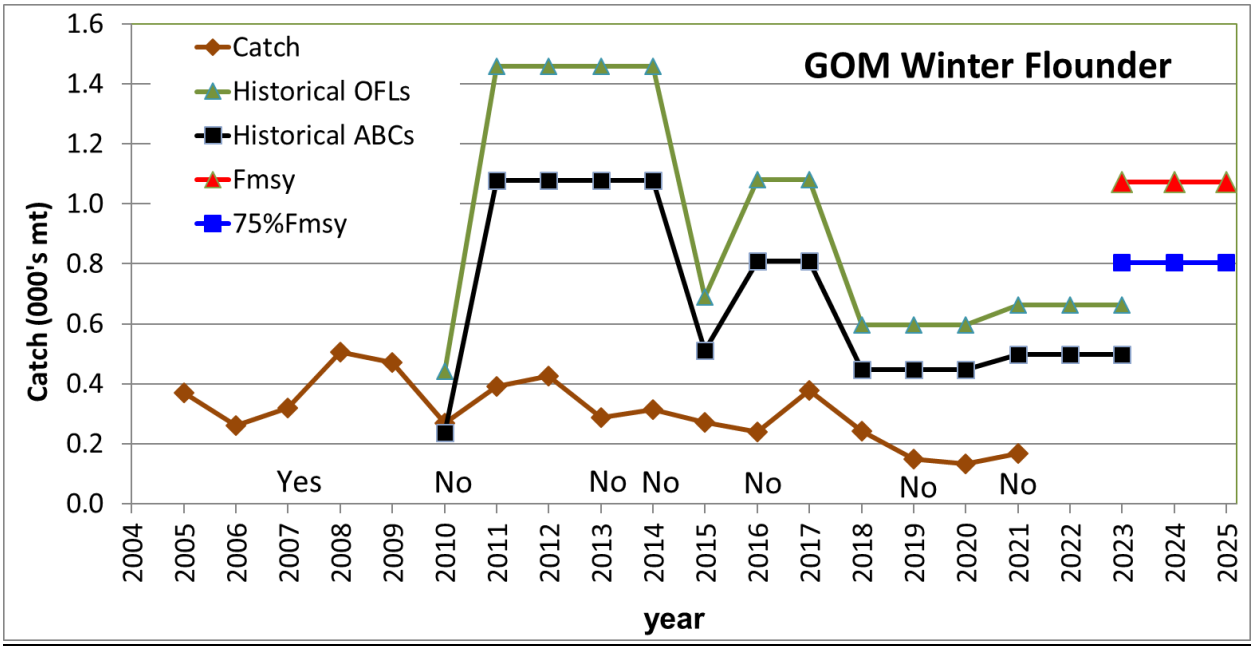


Table 14- Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and FMSY and 75% FMSY estimates for FY2023-FY2025 for GOM winter flounder.

Year	Catch	Historical OFLs	Historical ABCs	F_{MSY}	$75\%F_{MSY}$
2010	268	441	238		
2011	390	1,458	1,078		
2012	426	1,458	1,078		
2013	288	1,458	1,078		
2014	315	1,458	1,078		
2015	271	688	510		
2016	240	1,080	810		
2017	378	1,080	810		
2018	243	596	447		
2019	150	596	447		
2020	134	596	447		
2021	168	662	497		
2022		662	497		
2023		662	497	1,072	804
2024				1,072	804
2025				1,072	804

Additional Fishery Information:

Commercial Fishery – Figure 12 shows commercial groundfish (sector and common pool) catch of GOM winter flounder since FY2018 along with the FY2022 commercial ACL. Utilization by the commercial groundfish fishery has been similar over time and is low. Except for a few

quarters in FY2018, ACE lease prices for GOM winter flounder have been $0, which is logical given the low utilization rate (Figure 13).

Table 15 compares the performance of the QCM since FY2012 to the realized outcomes for GOM winter flounder. In recent years, the model has over-predicted catch and utilization (except for FY2021), likely explained by the declining trend in quotas and realized catches.

Figure 12. In-season utilization of GOM winter flounder by the commercial (sectors and common pool) groundfish fishery.

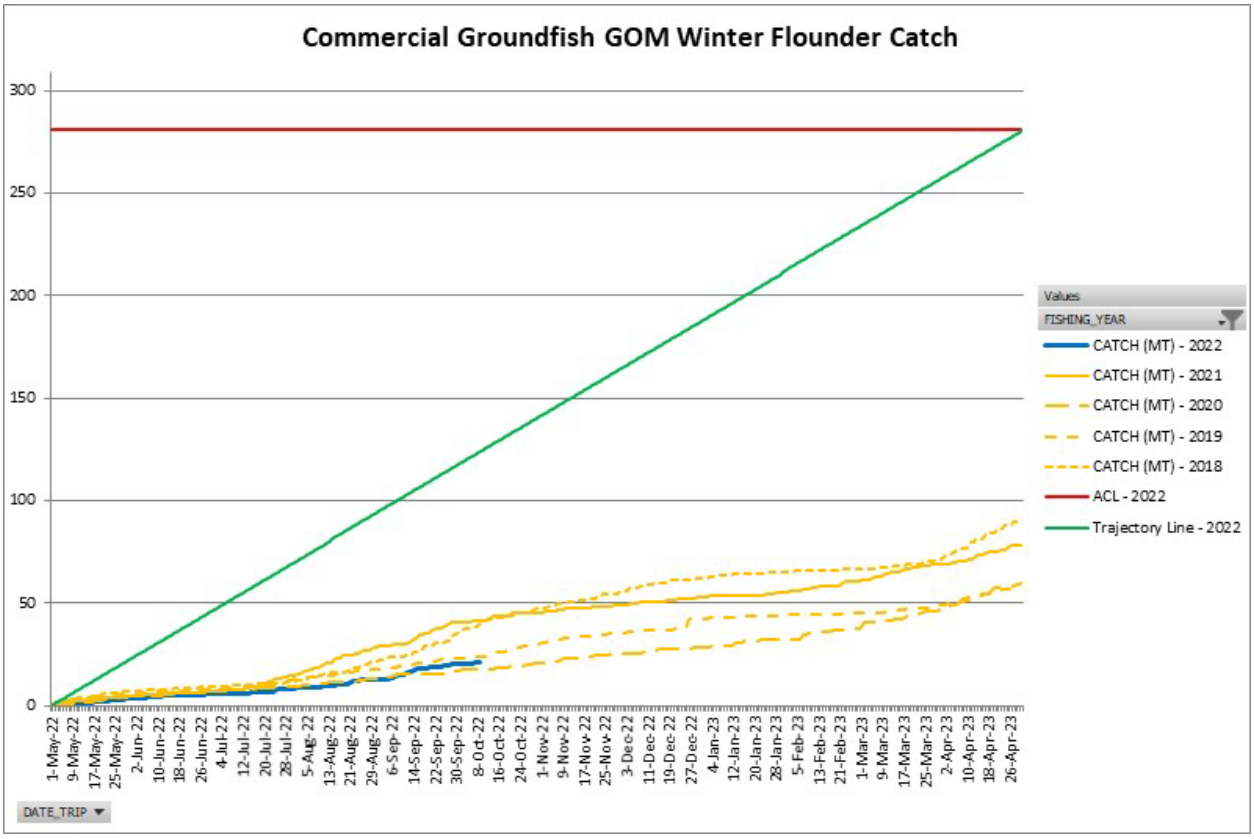


Figure 13. ACE lease prices estimated for GOM winter flounder for fishing years 2017-2021 using a hedonic price model comprised of inter-sector ACE leases. First quarter (May-July) lease prices are indicated by the vertical gray bars.

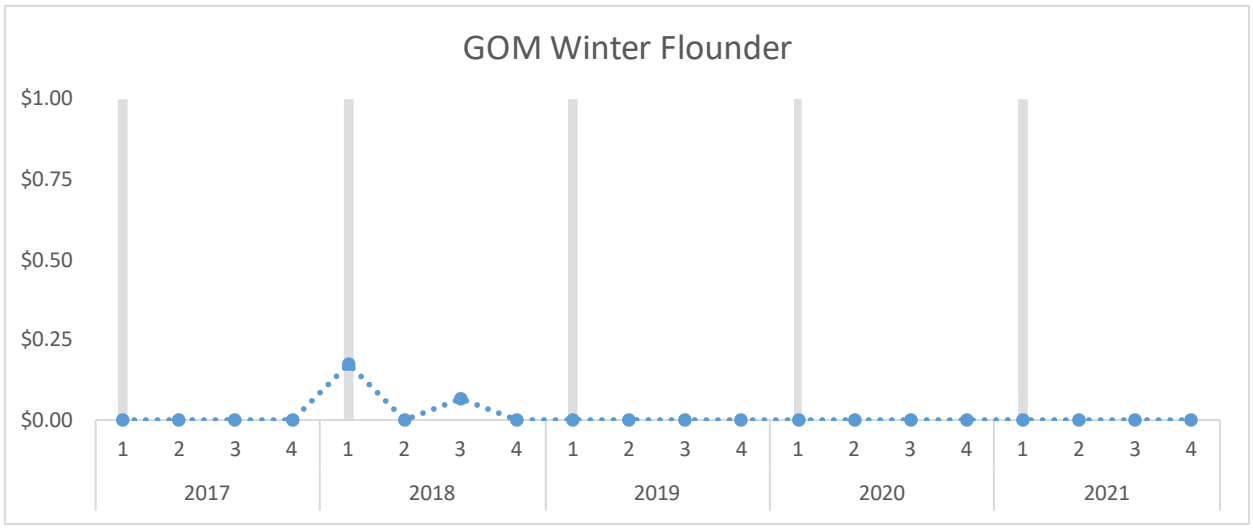


Table 15. GOM winter flounder stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021$).

		Sector sub-ACL	Catch (mt)		*Utilization (%)*		Gross Rev ($mil, 2021)	
	FY		Realized	Predicted	*Realized*	*Predicted*	Realized	Predicted
GOM Winter Flounder	2012	690	258	33	*0.37*	*0.05*	1.3	0.1
	2013	688	168	119	*0.24*	*0.16*	0.7	0.6
	2014	683	124	117	*0.18*	*0.17*	0.6	0.6
	2015	371	118	96	*0.32*	*0.26*	0.6	0.5
	2016	607	109	85	*0.18*	*0.14*	0.7	0.3
	2017	607	111	148	*0.18*	*0.24*	0.8	0.9
	2018	339	91	164	*0.27*	*0.48*	0.5	1.1
	2019	337	57	161	*0.17*	*0.48*	0.3	0.9
	2020	272	55	95	*0.20*	*0.35*	0.3	0.5
	2021	267	69	48	*0.26*	*0.18*	0.3	0.3

5. American plaice

Stock Status:
2022 peer review panel concluded American plaice is not overfished and overfishing is not occurring. Plaice was previously in a rebuilding plan with a rebuild by date of 2024, but the stock was determined to be rebuilt in the 2019 assessment.

Key Points:
The main sources of uncertainty are the commercial landings age samples and the recent decline in mean weights-at-age. State surveys are not used for this stock as they are thought to not be a good reflection of the entire stock.

Projections:
Table 16 provides possible OFLs and ABCs for FY2023- FY2025 for American plaice. ABC projections conducted at 75%F_{MSY}.

Table 16. Possible OFLs and ABCs (mt) for FY2023- FY2025 for American plaice, ABCs based on 75%F_{MSY}.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	7,316	5,699
2024	7,091	5,520
2025	6,763	5,270

Catch Performance:
Figure 14 and Table 17 summarize catch performance and changes in overfishing status for American plaice.

Figure 14. Catch performance for American plaice including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and FMSY and 75%FMSY for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis ("No" = not overfishing).

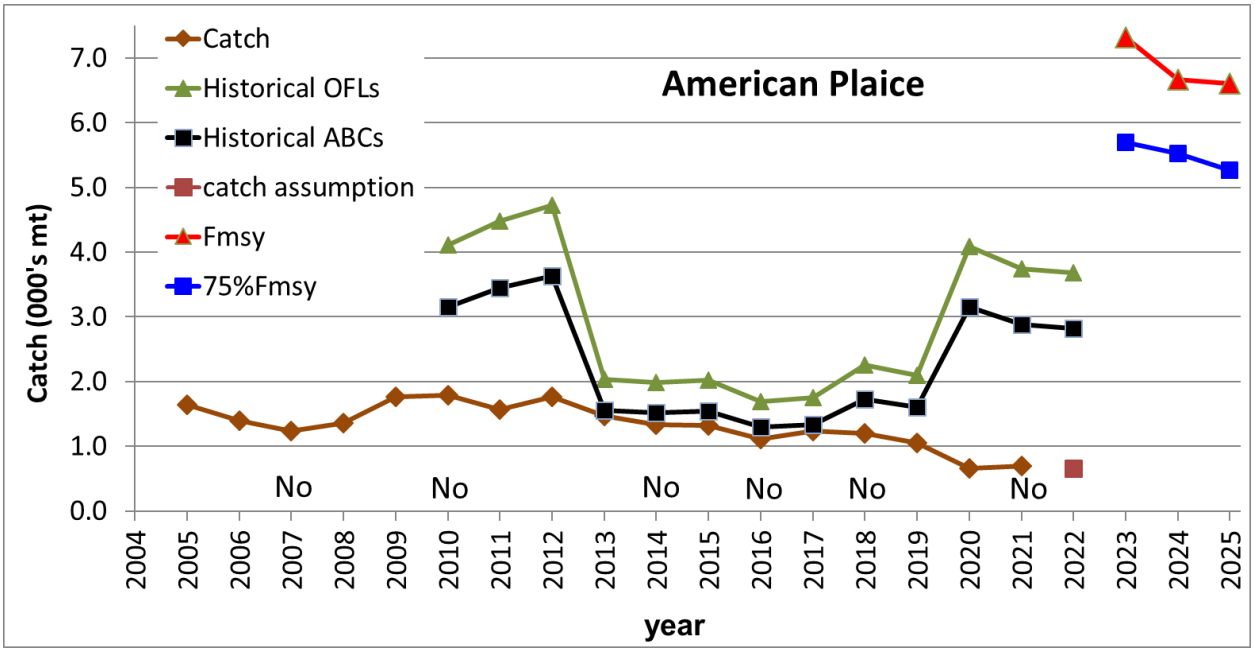


Table 17. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and FMSY and 75% FMSY estimates for FY2023-FY2025 for American plaice.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F_{MSY}	$75\%F_{MSY}$
2010	1,795	4,110	3,156			
2011	1,569	4,483	3,444			
2012	1,765	4,727	3,632			
2013	1,465	2,035	1,557			
2014	1,331	1,981	1,515			
2015	1,317	2,021	1,544			
2016	1,117	1,695	1,297			
2017	1,235	1,748	1,336			
2018	1,196	2,260	1,732			
2019	1,048	2,099	1,609			
2020	662	4,084	3,155			
2021	701	3,740	2,881			
2022		3,687	2,825	653		
2023					7,316	5,699
2024					6,667	5,520
2025					6,611	5,270

Additional Fishery Information:

Commercial fishery - Figure 15 shows commercial groundfish (sector and common pool) catch of American plaice since FY2018 along with the FY2022 commercial ACL. Exploitation of the stock has been low in recent years and catch is below the sub-ACL.

Table 18 compares the performance of the QCM since FY2012 to the realized outcomes for American plaice. The model has over-predicted catch, utilization, and revenue in recent years, likely due to the declining trends in quota and realized catch. Utilization has steadily decreased from around 100% from 2013-2015 to less than 30% in 2020 and 2021. Realized and predicted revenue has declined from around $5-6 million to $2-3 million. Trends in ACE lease prices have followed utilization trends (Figure 16).

Figure 15. In-season utilization of American plaice by the commercial (sectors and common pool) groundfish fishery.

Figure 16 - ACE lease prices estimated for American plaice for fishing years 2017-2021 using a hedonic price model comprised of inter-sector ACE leases. First quarter (May-July) lease prices are indicated by the vertical gray bars.

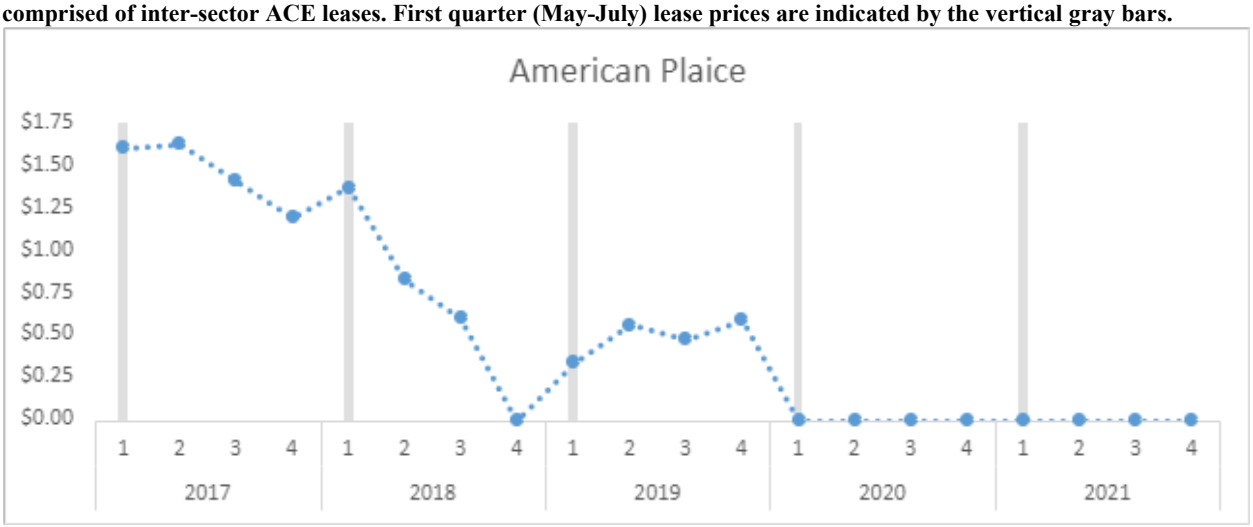


Table 18 - American plaice stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021$).

	FY	Sector sub-ACL	Catch (mt)		*Utilization (%)*		Gross Rev ($mil, 2021)	
			Realized	Predicted	*Realized*	*Predicted*	Realized	Predicted
American Plaice	2012	3223	1601	1,463	*0.50*	*0.30*	5.9	5.0
	2013	1395	1392	1,482	*1.00*	*0.78*	5.4	5.0
	2014	1356	1293	1,193	*0.95*	*0.88*	5.5	4.5
	2015	1381	1366	1,218	*0.99*	*0.88*	6.2	4.6
	2016	1163	1122	961	*0.97*	*0.83*	6.5	4.3
	2017	1196	1069	952	*0.89*	*0.79*	5.9	4.9
	2018	1552	1065	1,550	*0.69*	*1.00*	5.1	8.5
	2019	1436	836	1,441	*0.58*	*1.00*	3.3	7.7
	2020	2859	592	1,105	*0.21*	*0.38*	2.2	5.2
	2021	2592	688	818	*0.27*	*0.31*	2.5	3.0

6. Pollock

Stock Status:
Based on the 2022 stock assessment report, pollock is not overfished and overfishing is not occurring, with no change in stock status from the previous 2019 assessment. Pollock was rebuilt in 2009.

Key Points:
No retrospective adjustments were made to the model results. The separate commercial and recreational fleets were combined into a single fleet to reduce over-parameterization and improve model convergence.

The main source of uncertainty in the assessment is selectivity. In addition to the base model (dome-shaped survey selectivity), which is used to provide management advice, a flat sel sensitivity model (flat-topped survey selectivity) was conducted for the sole purpose of demonstrating the sensitivity of the assessment results to survey selectivity assumptions.

Potential consequences of basing catch advice on the dome-shaped based model and the flat-topped sensitivity model if the wrong model is selected are provided (Table 19). This analysis shows that overfishing would occur from 2023-2025 if the domed-shaped model is selected to set advice but the true selectivity is described by the flat-topped model. The converse is not true, overfishing would not occur if the flat-topped model is selected as the basis for catch advice but the true selectivity is best described by the dome-shaped model. However, this analysis assumes that projected catch will be caught and recent catch rates have been much lower than the dome-shaped model's projected catch. Unless effort dramatically increases it is unlikely that these catch projections will be realized.

Table 19. Consequence table comparing basing catch advice and outcomes depending on whether the dome-shaped based model (final model) and the flat-topped sensitivity model are chosen and consequences if the selected model does not model the true selectivity. Fs are shown as average F from ages 5-7. Grayed-out consequences on the diagonal show catch and outcomes if the "correct" selectivity is modeled meaning management catch is based on the true state of nature. Numbers highlighted in red indicate overfishing.

Biological status risk over the three years		state of nature							
		final				*sensitivity*			
		75%Fmsy final model catch in final model				*75%Fmsy final model catch in sensitivity model*			
			F	catch	SSB		F	catch	SSB
management catch	*final*	2022	0.042	3,959	221,460	2022	0.072	3,959	106,896
		2023	0.177	15,016	213,579	2023	0.310	15,016	105,307
		2024	0.177	13,940	194,517	2024	0.331	13,940	91,695
		2025	0.177	13,294	178,573	2025	0.354	13,294	79,760
		75%Fmsy sensitivity catch in final model				*75%Fmsy sensitivity catch in sensitivity model*			
			F	catch	SSB		F	catch	SSB
	sensitivity	2022	0.042	3,959	221,460	2022	0.072	3,959	106,896
		2023	0.103	9,006	213,579	2023	0.178	9,006	105,307
		2024	0.101	8,563	200,857	2024	0.178	8,563	97,723
		2025	0.099	8,337	190,477	2025	0.178	8,337	91,257

Projections:

Table 20 provides possible OFLs and ABCs for FY2023- FY2025 for pollock, under 75%FMSY projections from the dome-shaped selectivity model.

Table 20. Possible OFLs and ABCs (mt) for FY2023- FY2025 for pollock, 75%FMSY for ABCs.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	19,617	15,016
2024	18,208	13,940
2025	17,384	13,294

Catch Performance:

Figure 17 and Table 21 summarize catch performance and changes in overfishing status for pollock, including the flat sel sensitivity projections.

Figure 17. Catch performance for pollock including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and FMSY and 75%FMSY for FY2023-FY2025 under the base model and sensitivity model. Overfishing status in the terminal year of the assessment indicated on the x-axis ("No" = not overfishing, "Yes" = overfishing).

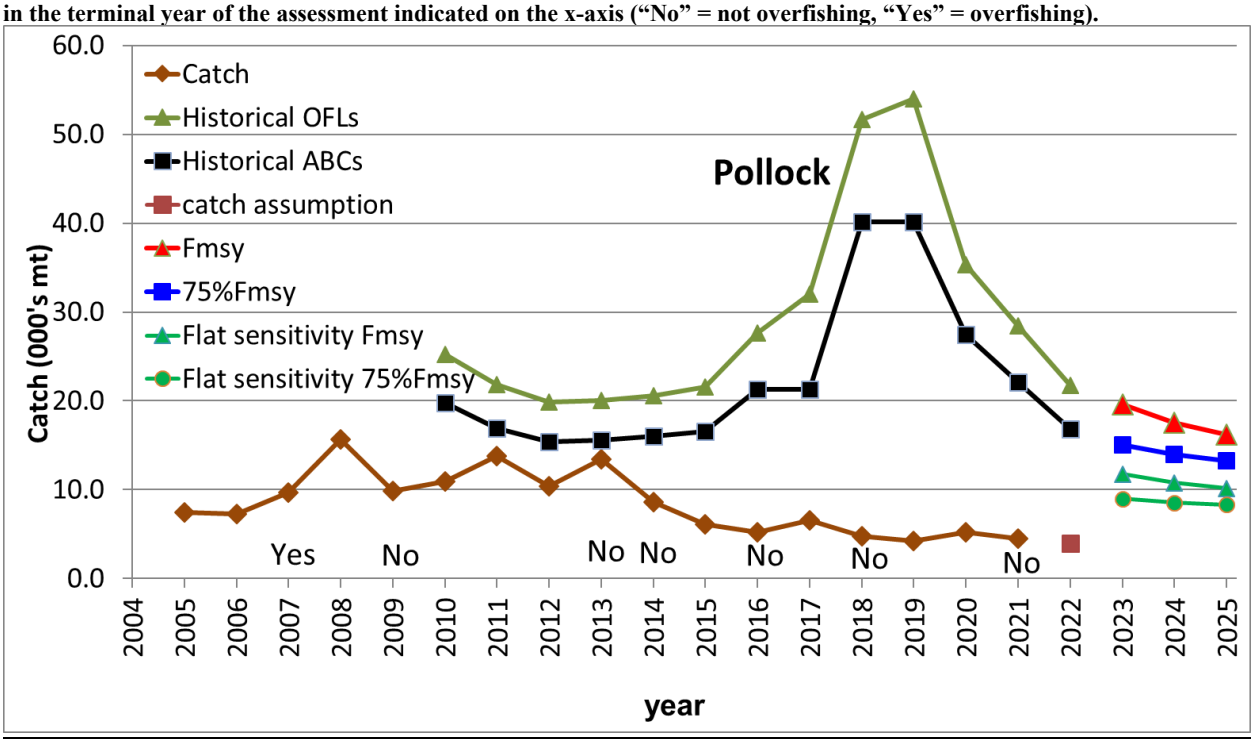


Table 21. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and FMSY and 75% FMSY estimates for FY2023-FY2025 for pollock.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	F_{MSY}	$75\%F_{MSY}$	Flat F_{MSY}	Flat $75\%F_{MSY}$
2010	10,897	25,200	19,800					
2011	13,792	21,853	16,900					
2012	10,370	19,887	15,400					
2013	13,428	20,060	15,600					
2014	8,613	20,554	16,000					
2015	6,138	21,538	16,600					
2016	5,226	27,668	21,312					
2017	6,597	32,004	21,312					
2018	4,772	51,680	40,172					
2019	4,265	53,940	40,172					
2020	5,231	35,358	27,447					
2021	4,522	28,475	22,062					
2022		21,744	16,812	3,959				
2023					19,617	15,016	11,760	9,006
2024					17,546	13,940	10,769	8,563
2025					16,245	13,294	10,168	8,337

Additional Fishery Information:

Commercial Fishery – Figure 18 shows commercial groundfish (sector and common pool) catch of pollock since FY2018 along with the FY2022 commercial ACL. Utilization by the

commercial groundfish fishery has been similar over time. ACE lease prices for pollock have been close to zero, which is logical given the recent low utilization rate.

Table 22 compares the performance of the QCM since FY2012 to the realized outcomes for pollock. In recent years, the model has slightly under-predicted catch and utilization, and in FY2020 and FY2021 gross revenue was under-predicted by over $3.5 million due to a sharp increase in pollock ex-vessel price from FY2019-2021.

Figure 18 - In-season utilization of pollock by the commercial (sectors and common pool) groundfish fishery.

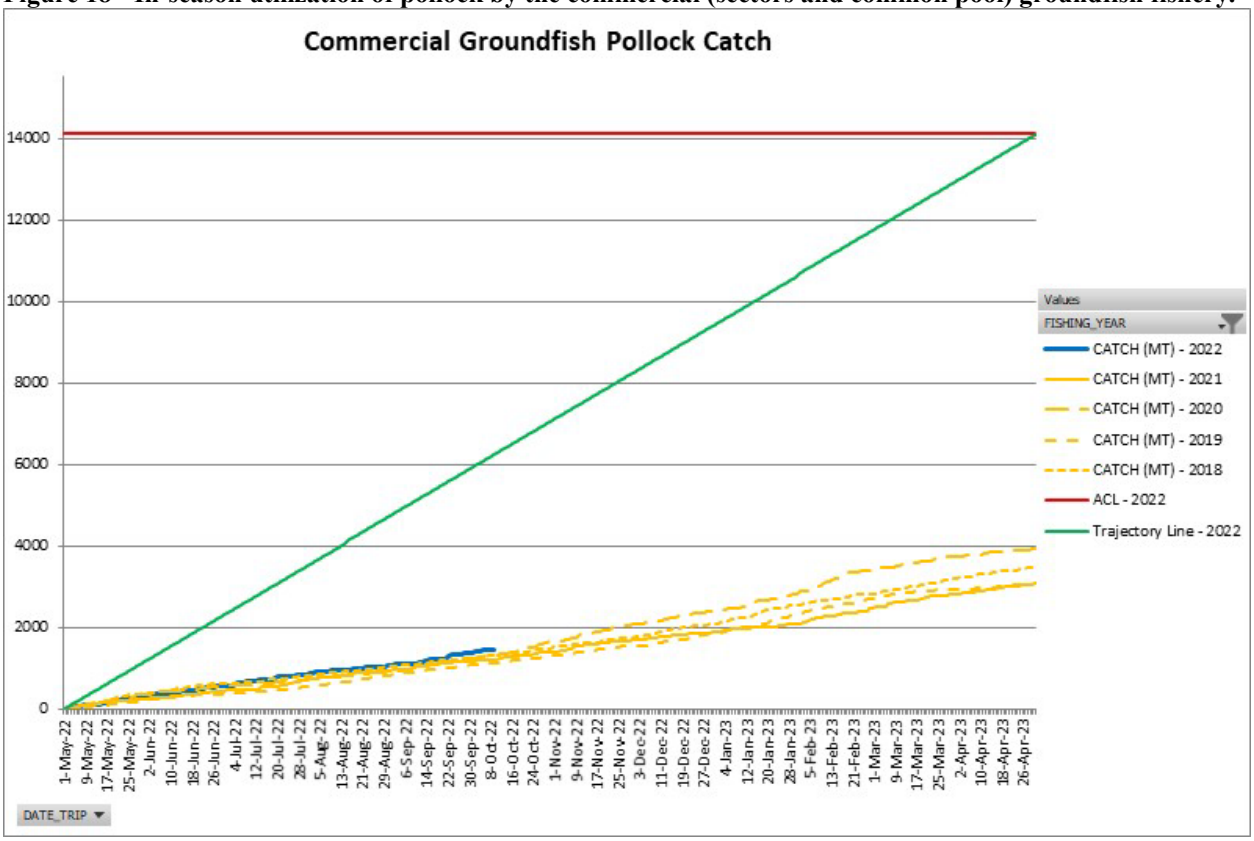


Table 22 - Pollock stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021$).

	FY	Sector sub-ACL	Catch (mt)		*Utilization (%)*		Gross Rev ($mil, 2021)	
			Realized	Predicted	*Realized*	*Predicted*	Realized	Predicted
Pollock	2012	12,530	6,395	4,296	*0.51*	*0.23*	15.0	9.5
	2013	12,802	4,878	7,133	*0.38*	*0.51*	12.4	14.9
	2014	13,139	3,972	5,384	*0.30*	*0.41*	11.2	12.4
	2015	13,634	2,877	3,707	*0.21*	*0.27*	7.6	9.4
	2016	17,704	2,962	3,739	*0.17*	*0.21*	6.8	10.6
	2017	17,704	2,990	3,564	*0.17*	*0.20*	6.2	9.8
	2018	37,170	3,476	2,796	*0.09*	*0.08*	5.8	6.9
	2019	37,152	3,070	2,898	*0.08*	*0.08*	5.8	6.3
	2020	23,752	3,936	2,935	*0.17*	*0.12*	9.0	4.8
	2021	18,356	3,069	3,034	*0.17*	*0.16*	8.9	5.5

7. Atlantic halibut

Stock Status:
2022 peer review panel concluded Atlantic halibut's stock status is unknown. Atlantic halibut is in a rebuilding plan with an end date of 2055.

Key Points
Sources of uncertainty include missing 2020 surveys (including the imputation of missing values), data limited assessment, stock structure, lack of BRPs, low catchability in NEFSC surveys, and uncertainty associated time lags in using the catch advice for the out years from the First Second Derivative method. In addition, there have been relatively large increases in the Canadian catch on Georges Bank in 2020 and 2021. It is unclear if these catches will continue.

Projections:
Table 23 provides possible OFLs and ABCs for FY2023- FY2025 for Atlantic halibut. ABC = 2021 catch (174 mt) X 0.85 multiplier = 149 mt.

Table 23. Possible OFLs and ABCs (mt) for FY2023- FY2025 for pollock, under a constant approach.

Fishing Year	Possible OFL (mt)	Possible ABC (mt)
2023	Unknown	149
2024	Unknown	149
2025	Unknown	149

Catch Performance:
Figure 19 and Table 21 summarize catch performance and changes in overfishing status for Atlantic halibut.

Figure 19. Catch performance for Atlantic halibut including: catches from CY2005-CY2021, historical OFLs and ABCs since FY2010, and ABCs for FY2023-FY2025. Overfishing status in the terminal year of the assessment indicated on the x-axis ("No" = not overfishing, "Unk" = unknown).

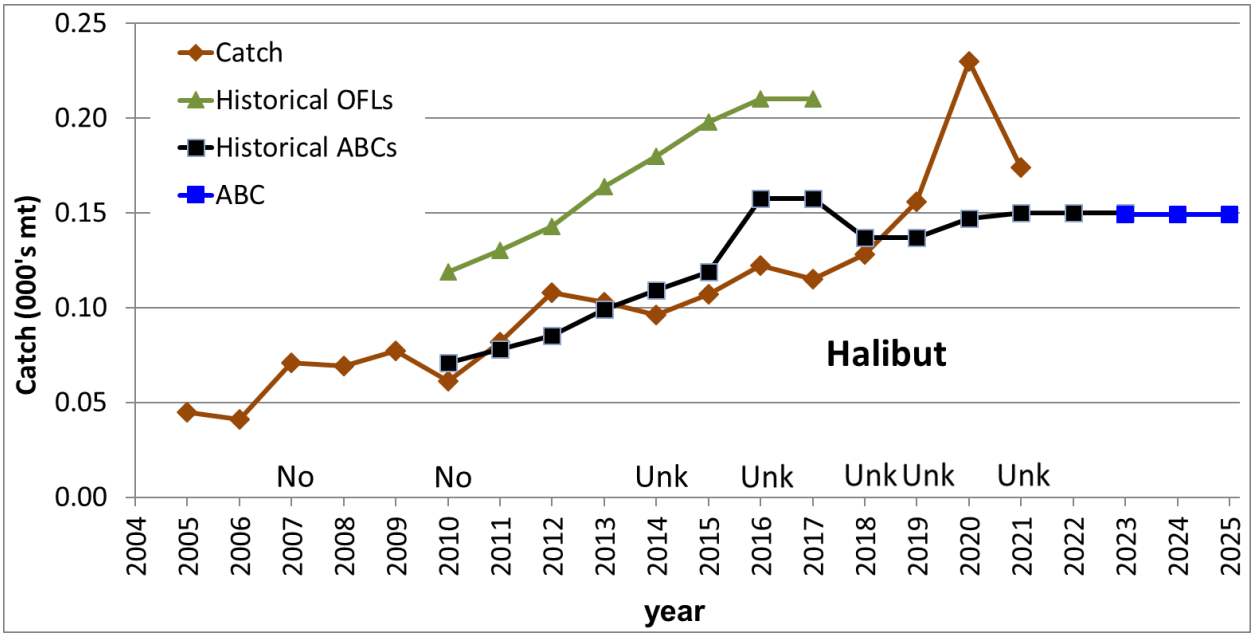


Table 24. Catch performance (CY2010-CY2021), historical OFLs and ABCs (FY2010-FY2022), and ABCs for FY2023-FY2025 for Atlantic halibut.

Year	Catch	Historical OFLs	Historical ABCs	F_{MSY}	ABC
2010	61	119	71		
2011	82	130	78		
2012	108	143	85		
2013	103	164	99		
2014	96	180	109		
2015	107	198	119		
2016	122	210	158		
2017	115	210	158		
2018	128	undefined	137		
2019	156	undefined	137		
2020	230	undefined	147		
2021	174	undefined	150		
2022			150		
2023			150	-	149
2024				-	149
2025				-	149

Additional Fishery Information:

Commercial Fishery – Figure 20 shows commercial groundfish (sector and common pool) catch of Atlantic halibut since FY2018 along with the FY2022 commercial ACL. Utilization by the commercial groundfish fishery has been similar across the fishing year, but has declined in more recent years.

Table 25 compares the performance of the QCM since FY2012 to the realized outcomes for Atlantic halibut. In recent years, the model has over-predicted catch.

Figure 20. In-season utilization of Atlantic halibut by the commercial (sectors and common pool) groundfish fishery.

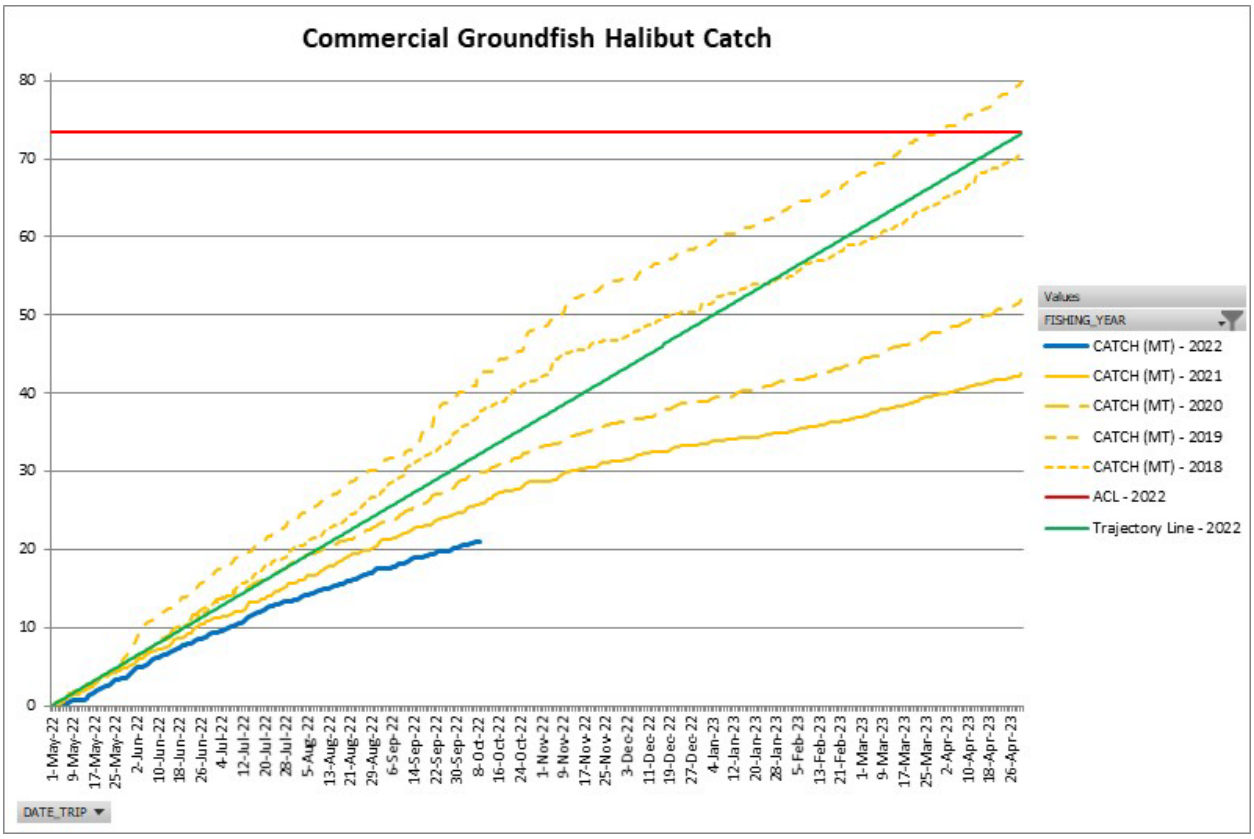


Table 25- Atlantic halibut stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2012 and 2021 compared to realized catch and revenue (in 2021$).

		Catch (mt)		Gross Rev ($mil, 2021)	
	FY	Realized	Predicted	Realized	Predicted
Halibut	2012	57	23	0.2	0.2
	2013	54	42	0.2	0.2
	2014	46	44	0.3	0.1
	2015	59	47	0.3	0.2
	2016	57	45	0.3	0.3
	2017	68	74	0.4	0.4
	2018	70	73	0.4	0.4
	2019	77	89	0.4	0.5
	2020	49	72	0.4	0.4
	2021	41	72	0.3	0.4

Appendix 1- Summary of CY2022 bridge-year catch estimates prepared by the PDT.

CY2022 Catch Estimates Provided to NEFSC on Aug. 23, 2022

Stock	US Catch (mt)	Canadian Catch (mt)	Total Catch (mt)
GB Haddock	2,912	7,002	**9,914**
GOM Haddock	3,912		**3,912**
SNE/MA Yellowtail Flounder	4		**4**
CC/GOM Yellowtail Flounder	350		**350**
American Plaice	653		**653**
GB Winter Flounder	240	38	**278**
White Hake	1,913	52	**1,964**
Pollock	3,959		**3,959**

Tables 1-3, which follow, summarize the US catch estimate for the total catch, landings, and discards for calendar year 2022. Canadian catch estimate for GB winter flounder and white hake are the recent 3-year average of Canadian catches in the 2022 stock assessment reports and for GB haddock are the 2021 catch for Canada (same assumption in the EGB haddock projection prepared by the TRAC in 2022).

Table 1: Projected CY 2022 Northeast Multispecies 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
GB Haddock	2912.1	2899.0	2898.6	0.4		0.2			1.9	11.0
GOM Haddock	3911.7	3847.8	2840.0	7.1	1000.7	-			57.1	6.8
SNE/MA Yellowtail Flounder	3.9	0.3	0.3	0.0			1.4		0.0	2.2
CC/GOM Yellowtail Flounder	349.9	280.5	266.2	14.2					32.1	37.3
Plaice	652.9	628.3	624.9	3.4					10.1	14.5
GB Winter Flounder	239.8	220.1	220.1	-					-	19.7
White Hake	1912.7	1897.5	1896.4	1.1					0.9	14.3
Pollock	3958.6	2863.4	2863.2	0.2					746.4	348.7

Sector and common pool first six month catch estimates used final FY21 DMIS data dated August 10, 2022 and FY22 DMIS data run August 10, 2022.
Second six month catch estimates based on final FY21 DMIS data dated August 10, 2022.

State waters landings and discards were based on either three year or five year average of fishing year landings and discards

Other sub-component landings and discards were based on either three year or five year average of fishing year landings and discards

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 22, 2022

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.

Table 2: Projected CY 2022 Northeast Multispecies Landings (mt)

Stock	**Total Landings**	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
GB Haddock	2851.3	2848.2	2847.8	0.4		0.2			0.1	2.8
GOM Haddock	3680.5	3621.8	2795.5	7.0	819.3	-			56.1	2.6
SNE/MA Yellowtail Flounder	0.3	0.2	0.2	0.0			-		0.0	0.1
CC/GOM Yellowtail Flounder	280.7	248.0	234.2	13.8					31.8	0.9
Plaice	588.8	578.8	575.4	3.4					8.9	1.0
GB Winter Flounder	219.8	219.3	219.3	-					-	0.5
White Hake	1884.4	1881.4	1880.4	1.1					0.6	2.4
Pollock	3201.0	2790.3	2790.2	0.1					323.8	86.8

Sector and common pool first six month catch estimates used final FY21 DMIS data dated August 10, 2022 and FY22 DMIS data run August 10, 2022.
Second six month catch estimates based on final FY21 DMIS data dated August 10, 2022.
State waters landings and discards were based on either three year or five year average of fishing year landings and discards
Other sub-component landings and discards were based on either three year or five year average of fishing year landings and discards

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 22, 2022

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.

Table 3: Projected CY 2022 Northeast Multispecies Estimated Discards (mt)

Stock	**Total Discards**	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
GB Haddock	60.8	50.8	50.8	0.0		0.0			1.8	8.1
GOM Haddock	231.2	226.0	44.4	0.1	181.4	-			1.0	4.2
SNE/MA Yellowtail Flounder	3.6	0.1	0.1	0.0			1.4		0.0	2.1
CC/GOM Yellowtail Flounder	69.2	32.4	32.1	0.4					0.3	36.4
Plaice	64.2	49.5	49.5	0.0					1.2	13.5
GB Winter Flounder	20.0	0.8	0.8	-					-	19.2
White Hake	28.2	16.1	16.0	0.1					0.3	11.9
Pollock	757.6	73.1	73.0	0.1					422.6	261.9

Sector and common pool first six month catch estimates used final FY21 DMIS data dated August 10, 2022 and FY22 DMIS data run August 10, 2022.
Second six month catch estimates based on final FY21 DMIS data dated August 10, 2022.

State waters landings and discards were based on either three year or five year average of fishing year landings and discards

Other sub-component landings and discards were based on either three year or five year average of fishing year landings and discards

Values in metric tons of live weight

Sector and common pool include estimate of missing dealer reports

Source: NMFS Greater Atlantic Regional Fisheries Office

August 22, 2022

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.

Appendix 2- Summary of Gulf of Maine haddock recreational catch performance and federal management (fishing years 2010–2022).

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
2010	324	297.4	91.8	18	no limit		n/a	First year of sub-ACL 27.5% of ACL; Groundfish Regulations: Only one line per angler, and Fillets landed by private recreational and charter/party vessels must have at least 2 sq. inches (5.08 sq. cm) of contiguous skin that allows for the ready identification of the fish species. Such fillets are required to be from legal-sized fish, but the fillets themselves would not need to meet the minimum size requirements in the regulations.
2011	308			18	no limit	5/1/11 to 1/5/12	n/a	First Year: Gulf of Maine (Whaleback) Cod Spawning Protection Area: From April 1 through June 30 of each year, all recreational vessels, including private recreational and charter/party vessels, may only use pelagic hook-and-line gear, as defined below, when fishing in the Whaleback Cod Spawning Protection Area.[1]
				19	9	1/6/12 to 4/19/12	n/a	Accountability Measure (AM) for 2010 overage
		238.5	77.4	18	no limit	4/20/12 to 4/30/12	n/a	AM lifted after re-evaluation of data showing no 2010 overage
2012	259	280.7	108.4	18	no limit		n/a	
2013	74	231.5	312.2	21	no limit		n/a	
2014	173	658.6	380.7	21	3	5/1/14 to 8/31/14 and 11/1/14 to 2/28/15	9/1/14 to 10/31/14 and 3/1/15 to 4/30/15	GOM Cod interim action: Seasonal 30-minute block closures, no recreational gear capable of catching groundfish in closures, in place 11/15/14 through 4/30/15.

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
2015	372	381.9	102.7	17	3	5/1/15 to 8/31/15 and 11/1/15 to 2/29/16	9/1/15 to 10/31/15 and 3/1/16 to 4/30/16	
2016	928	887.0	95.6	17	15	5/1/16 to 2/28/17 and 4/15/17 to 4/30/17	3/1/17 to 4/14/17	
2017	1,160			17	15	5/1/17 to 2/28/18 and 4/15/18 to 4/30/18	3/1/18 to 4/14/18	Replaced by final rule effective 7/27/17
		795.0	68.5	17	12	5/1/17 to 9/16/17 and 11/1/17 to 2/28/18	9/17/17 to 10/31/17 and 3/1/18 to 4/14/18	

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
						and 4/15/18 to 4/30/18		
2018	3,358	595.0	17.7	17	12	5/1/18 to 9/16/18 and 11/1/18 to 2/28/19 and 4/15/19 to 4/30/19	9/17/18 to 10/31/18 and 3/1/19 to 4/14/19	First Year: Winter Massachusetts Bay Spawning Protection Area: From November 1 through January 31 of each year, all recreational vessels, including private recreational and charter/party vessels, may only use pelagic hook-and-line gear, as defined below, when fishing in the Winter Massachusetts Bay Spawning Protection Area.[1]
2019	3,194	423.2	13.3	17	15	5/1/19 to 2/29/20 and 4/15/20 to 4/30/20	3/1/20 to 4/14/20	Previous year's regulations were in effect until July 5, 2019, when these measures were implemented. The possession limit increased from 12-15 fish, and the fall closure has been removed to increase access to this healthy stock.
2020	6,210	1202.3	19.4	17	15	5/1/20-2/28/21 and	3/1/21-3/31/21	

Fishing Year	Sub-Annual Catch Limit (mt)	Catch (mt)	Percent of catch limit taken (%)	Minimum Size (inches)	Bag Limit Fish per angler - daily	Season Open	Season Closed	Additional Measures/Notes
						4/1/21-4/30/21		
2021	5,295	901.5	17	17	15	5/1/21-2/28/22 and 4/1/22-4/30/22	3/1/22-3/31/22	
2022	3,634			17	Initially 15 Revised to 20 (see notes)	5/1/21-2/28/28 and 4/1/22-4/30/22	3/1/22-3/31/22	An increase in the bag limit from 15 fish to 20 fish became effective August 30, 2022.