Groundfish Specifications
Groundfish Plan Development Team

Scientific and Statistical Committee

October 25, 2021

New England
Fishery Management Council

Council Milestones

- *June – initiated Framework Adjustment 63*
- **September** – received and approved TMGC's TAC recommendations for U.S./Canada stocks, updated on draft alternatives development
- **December** – receive specifications alternatives and take final action on specifications and other measures
- **May** – Implementation by **May 1, 2022,** NMFS

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Scope

**2022-2024 Specifications/Management Measures, to include:**

- Set 2022 total allowable catches for US/Canada management units of Eastern Georges Bank (GB) cod and Eastern GB haddock, and 2022-2023 specifications for the GB yellowtail flounder stock,

- Set 2022-2024 specifications for GB cod and Gulf of Maine (GOM) cod, and possibly adjust 2022 specifications for GB haddock and GOM haddock,

- Adjust 2022 specifications for white hake based on the rebuilding plan,

- Adopt additional measures to promote stock rebuilding, and

- Develop alternatives to the current default specifications system.

Georges Bank Cod & Gulf of Maine Cod Fishing Year 2022-Fishing Year 2024 OFLs and ABCs

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Table 1- Summary of rebuilding status for cod stocks based on the most recent assessment in 2021.

Groundfish Stock	Rebuilding Plan Start of the Current Plan	Planned Rebuilding Date	Years Remaining in Plan, starting with FY2022	Total ACLs exceeded within past three completed FYs? *If yes, identify the FYs.*	Has the original rebuilding F been achieved? Or is this unknown? *Indicate the current F estimate relative to F rebuild at the start of the plan.*	What is current SSB estimate relative to SSBMSY? Or is this unknown?
Georges Bank cod	5/1/2004	2026	5	No	Unknown	Unknown
Gulf of Maine cod	5/1/2014	2024	3	Yes: [129.5% of the total ACL in FY2017]	F rebuild (plan start) = 0.161 (m=0.2 model) and 0.177 (m-ramp model) F2019full = 0.249 (m=0.2 model with retrospective adjustment) and 0.172 (m-ramp model)	SSB2019 = 1,969 mt (m=0.2 model with retrospective adjustment) and 3,223 mt (m-ramp model) 5% and 5%, respectively of SSBMSY proxy 39,912 mt (m=0.2 model) and 60,010 mt (m-ramp model)

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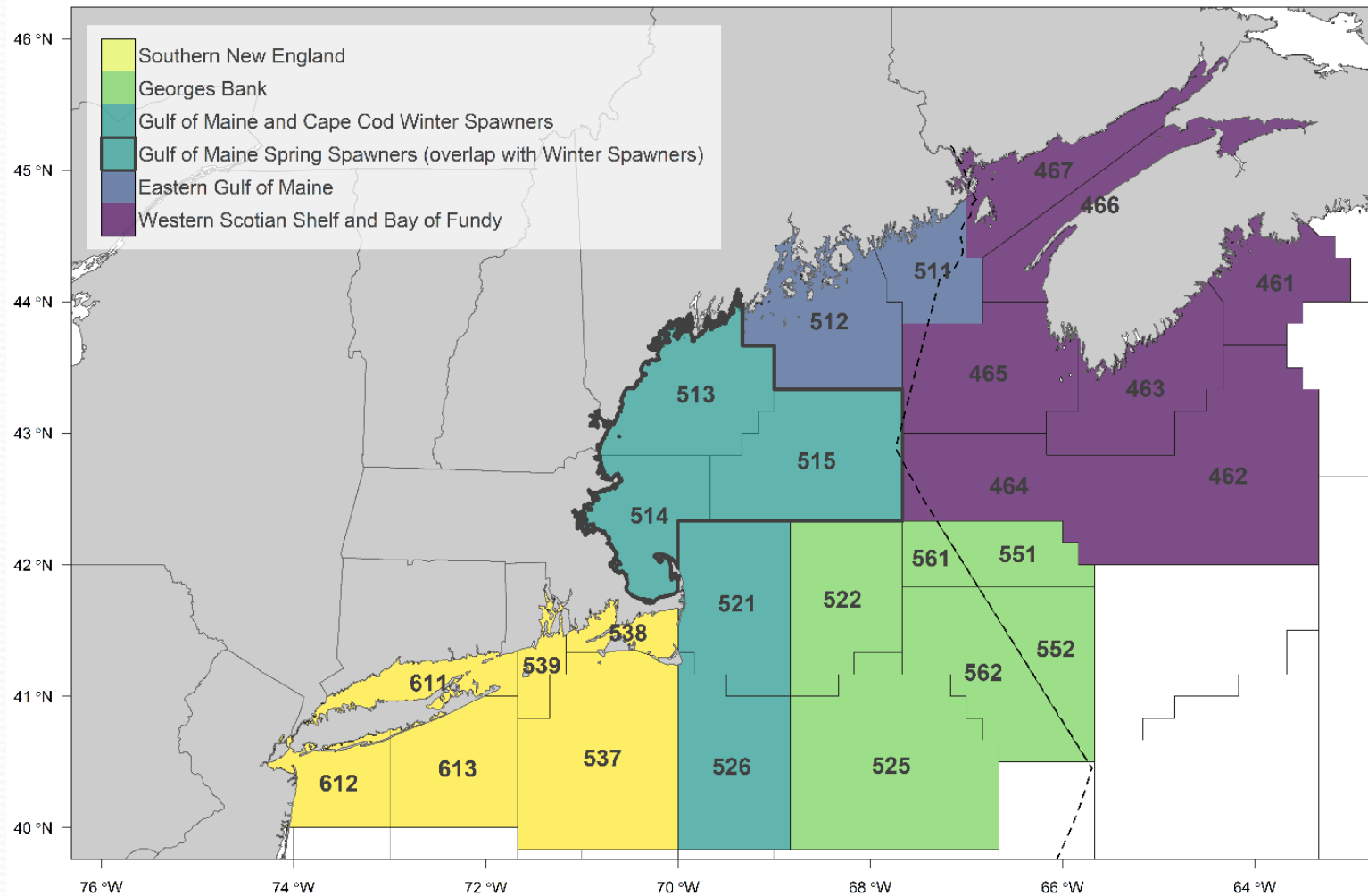
Sectors

- Majority of the commercial fishery
- System of quotas and sector allocations
- Leasing/trading
- Accountability measures
- Gulf of Maine cod protection closures
- Spawning closures
- Reporting and Monitoring- ASM and NEFOP
- Gear and mesh restrictions
- Minimum fish sizes (19 in for cod)
- Sector Operations Plans

GARFO
Summary Table
Sector
Catch Monitoring

Report run on:	October 21 2021
For data reported through:	October 19, 2021
Quota Period:	2021
Quota Period Dates:	May 1, 2021 to April 30, 2022

Stock	Cumulative Kept (mt)	Cumulative Discard (mt)	Cumulative Catch (mt)	Sub-ACL** (mt)	Percent Caught
GB Cod East	20.5	0.8	21.3	182.1	11.7
GB Cod	181.5	4.5	186.1	1045.2	17.8
GOM Cod	52.5	2.1	54.5	262.2	20.8

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Common Pool

- System of trimester quotas
- Trip limits
- Area base restrictions and closure in-season
- Gulf of Maine cod protection closures
- Spawning closures
- Reporting and Monitoring- NEFOP
- Gear and mesh restrictions
- Minimum fish sizes (19 in for cod)

Common Pool Trimester Total Allowable Catch Area Closures

Stock	Statistical Area	Gear
Gulf of Maine (GOM) cod	513, 514	Trawl, gillnet, longline/hook
Georges Bank (GB) cod	521, 522, 525, 561	Trawl, gillnet, longline/hook

GARFO
Summary Table
Common Pool Full Year
Catch Monitoring

Report run on: October 21, 2021
For data reported through: October 19, 2021
Quota Period: 2021
Quota Period Dates: May 1, 2021 to April 30, 2022

Stock	Cumulative Kept (mt)	Cumulative Discard (mt)	Cumulative Catch (mt)	Sub-ACL (mt)	Percent Caught
GB Cod East	0.0	0.0	0.0	8.4	0.0
GB Cod	1.0	0.1	1.0	47.9	2.2
GOM Cod	0.9	0.4	1.4	8.2	16.4

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Figure 2- In-season utilization of GB cod by the commercial (sectors and common pool) groundfish fishery.
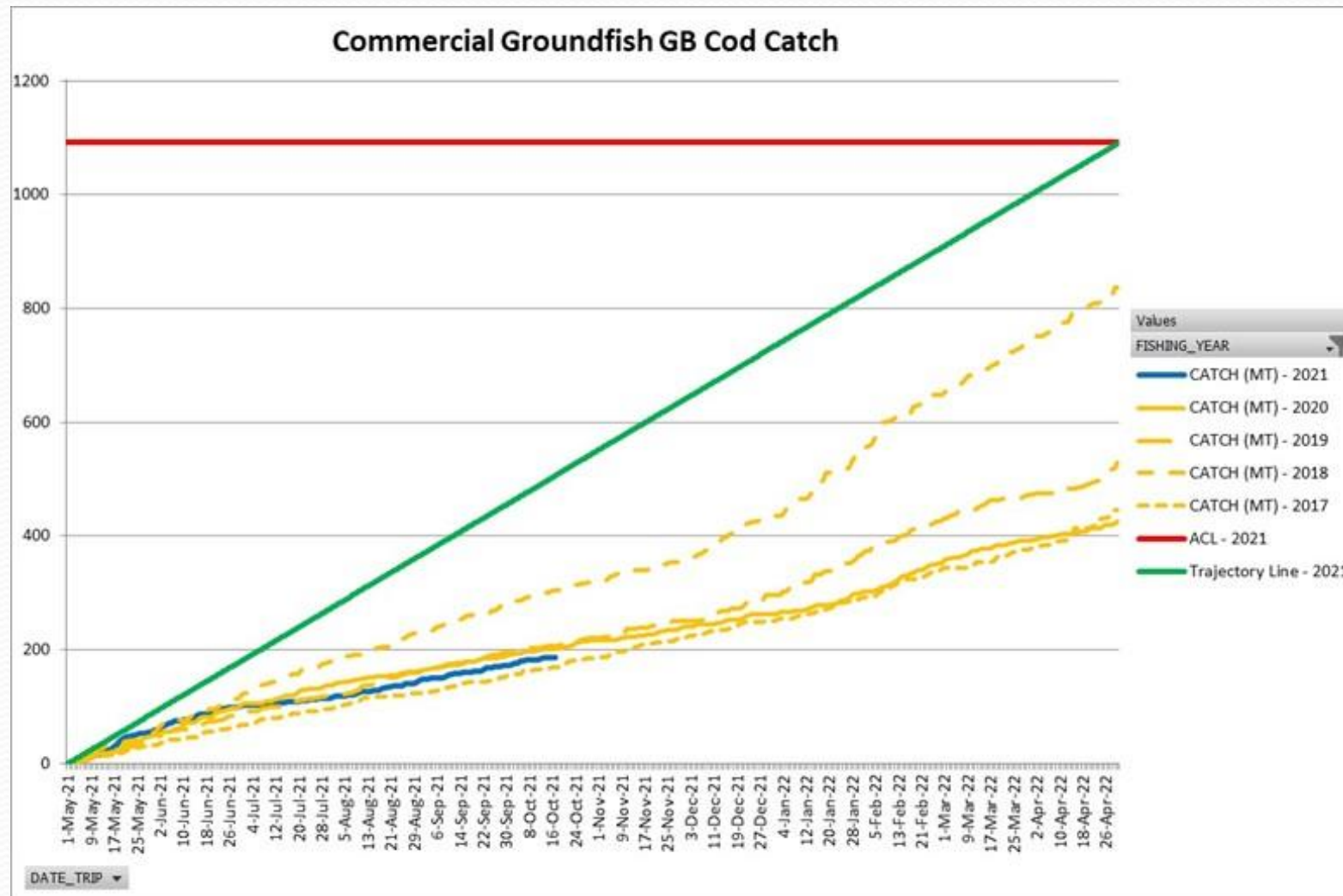
Figure 3- In-season utilization of GOM cod by the commercial (sectors and common pool) groundfish fishery.
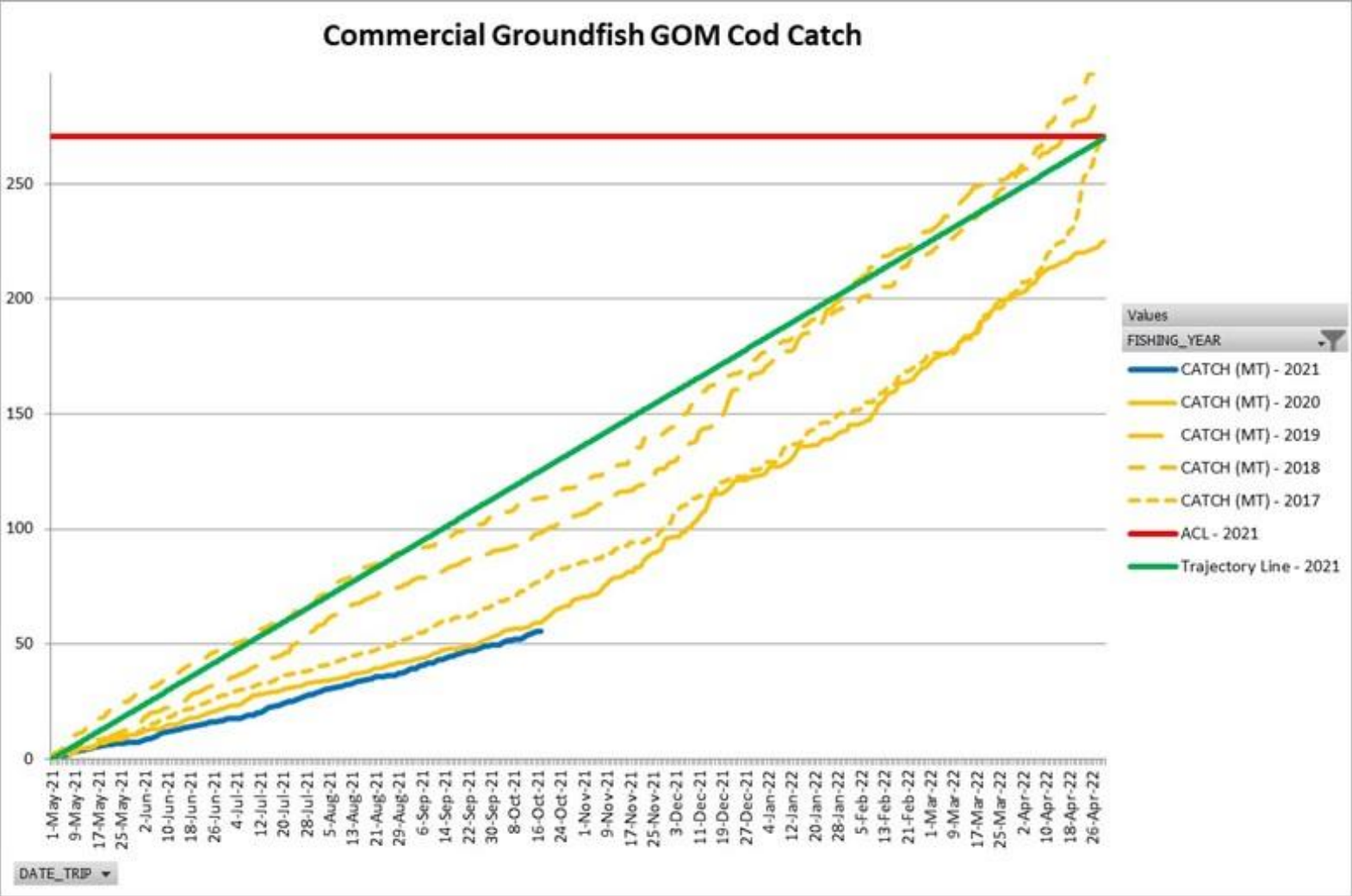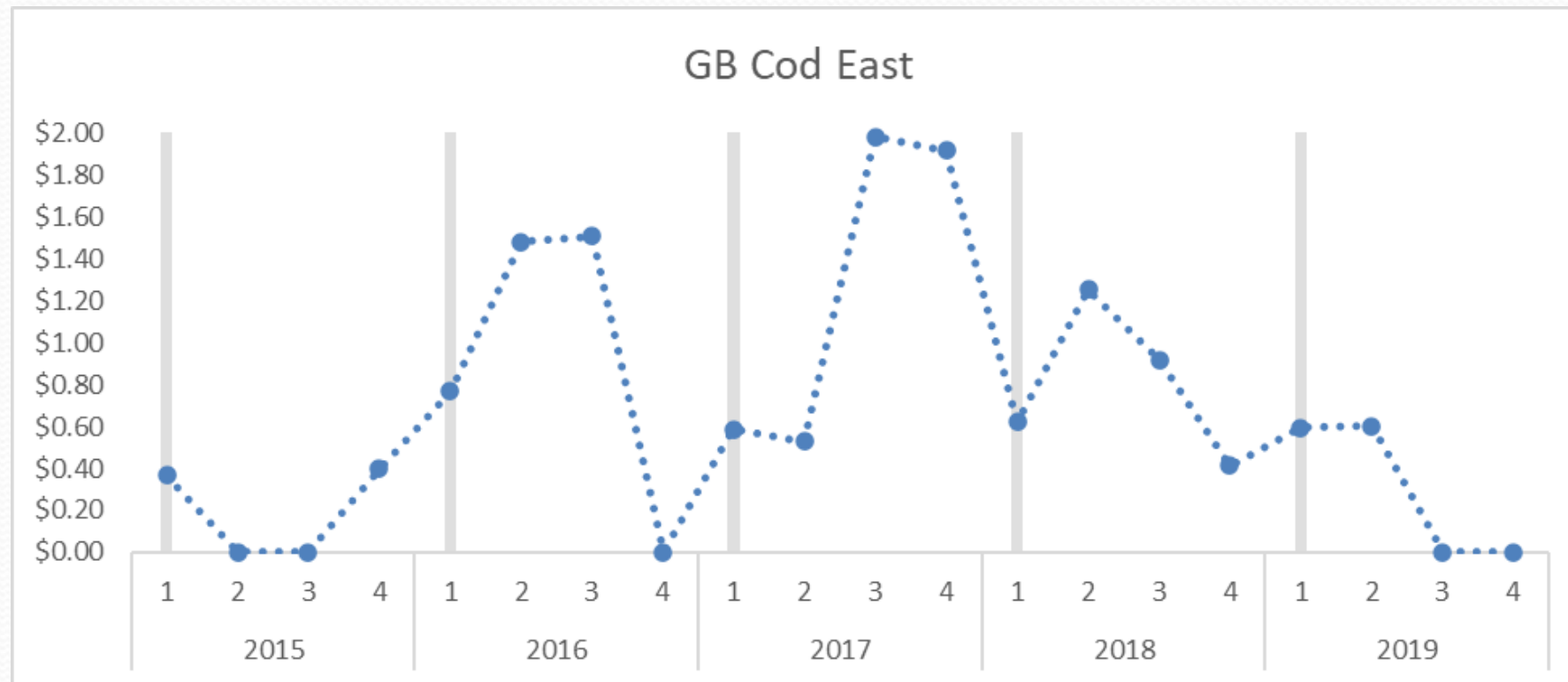
Figure 4- ACE lease prices estimated for GB cod east (top), GB cod west (middle), and GOM cod (bottom) for fishing years 2015-2019 using a hedonic price model. First quarter (May-July) lease prices are indicated by the vertical gray bars in the figures.
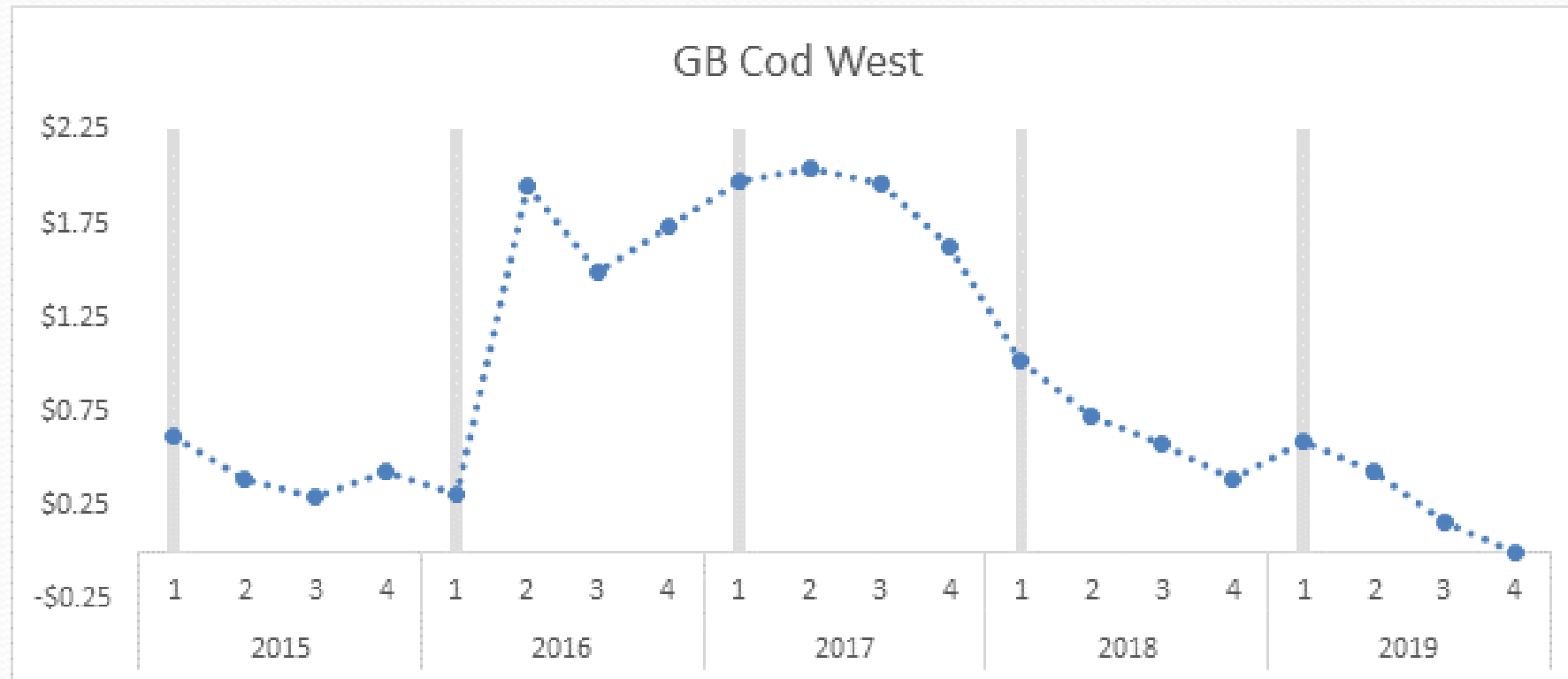
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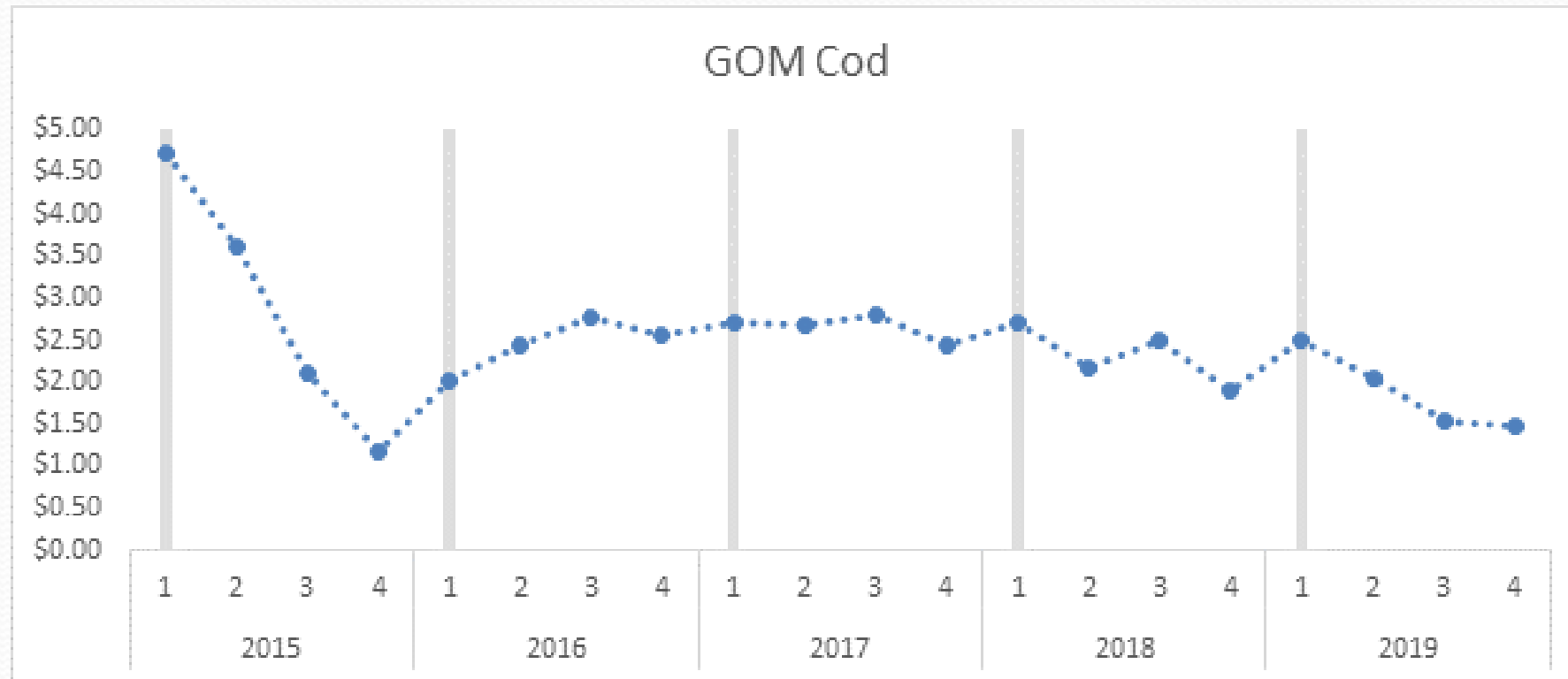
Table 2- GB cod stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2011 and 2020 compared to realized catch and revenue (in 2020$).

	FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev ($mil, 2020)	
			Realized	Predicted	Realized	Predicted	Realized	Predicted
GB Cod	2011	3,878	2,987	3,338	0.77	0.86	13.5	15.1
	2012	4,079	1,437	1,149	0.35	0.28	7.6	5.6
	2013	2,131	1,500	1,657	0.70	0.78	6.4	7.4
	2014	1,584	1,295	1,525	0.82	0.96	5.6	7.7
	2015	1,629	1,522	1,526	0.93	0.94	6.3	6.3
	2016	550	488	547	0.89	0.99	2.7	2.6
	2017	378	389	377	1.03	1.00	2.1	1.6
	2018	1,083	720	616	0.66	0.57	3.2	3.2
	2019	1,351	452	489	0.33	0.36	2.3	2.6
	2020	851	352	826	0.41	0.97	1.7	3.6

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Table 3- GOM cod 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$).

	FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev ($mil, 2020)	
			Realized	Predicted	Realized	Predicted	Realized	Predicted
GOM Cod	2011	4,825	4,268	4,737	0.88	0.98	21.2	25.3
	2012	3,619	2,070	3,572	0.57	0.99	11.2	18
	2013	881	716	871	0.81	0.99	4	4.7
	2014	814	638	803	0.78	0.99	3	4.8
	2015	202	171	201	0.85	1.00	0.9	1.1
	2016	273	255	268	0.93	0.98	1.6	1.3
	2017	271	248	268	0.92	0.99	1.5	1.3
	2018	377	304	354	0.81	0.94	1.7	2.2
	2019	378	271	339	0.72	0.90	1.6	1.9
	2020	267	214	267	0.80	1.00	1.2	1.4

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Recreational

- Angler and For–Hire (party/charter) modes
- Bag limits
- Seasons
- Minimum fish size
- For-Hire reporting requirements eVTR
- Marine Recreational Information Program
- Catch target for Georges Bank cod to determine measures
- Sub-ACL for Gulf of Maine cod
- Bioeconomic model

Current Gulf of Maine Measures
Open season:
•Private Anglers - September 15-30; April 1 - 14
•Party/Charter Anglers - September 8 - October 7; April 1 - 14
Minimum size: 21 inches
Possession limit:
•Private Anglers - 1 fish per day.
•Party/Charter Anglers - 1 fish per day

Current GB Cod Measures
Open season: All year
Minimum size: 21 inches
Possession limit:
•Private Anglers - 10 fish per day.
•Party/Charter Anglers - 10 fish per day

Georges Bank Cod
Fishing Year 2022-Fishing Year 2024 OFLs and ABCs

Figure 5- Catch performance for Georges Bank cod including: catches from CY2005- CY2020, historical OFLs and ABCs since FY 2010, and constant ABC approach (FY2022-FY2024). Overfishing status in the terminal year of the assessment indicated on the x-axis ("Yes" = overfishing, "No" = not overfishing, and "unk" = unknown overfishing status).
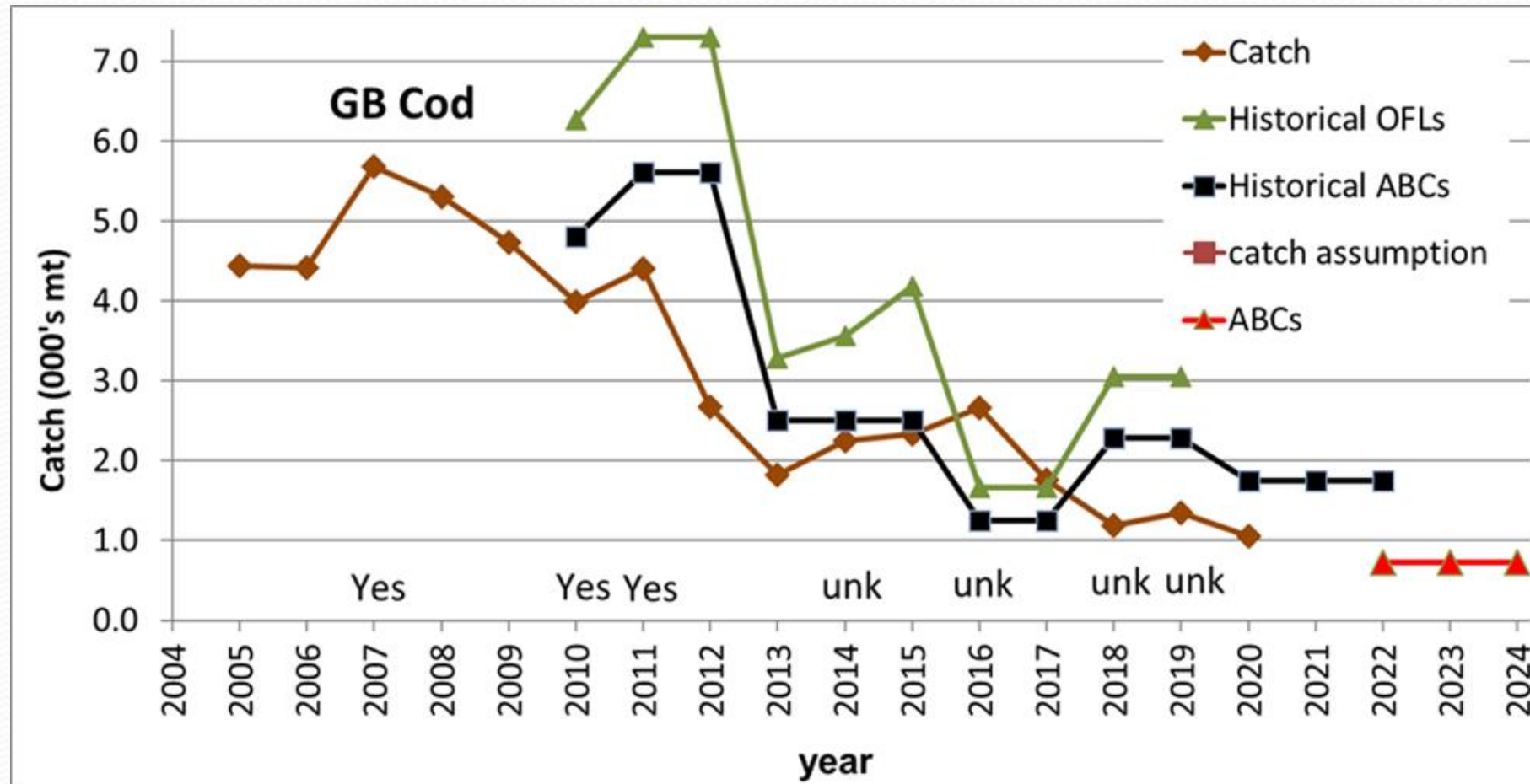
Table 4- GB cod catch performance (CY2010-CY2020) and historical OFLs and ABCs (FY2010-FY2022), compared with the possible candidate ABCs - constant approach (FY2022-FY2024).

Year	Catch	Historical OFLs	Historical ABCs	ABC
2010	3,986	6,272	4,812	
2011	4,404	7,311	5,616	
2012	2,679	7,311	5,616	
2013	1,827	3,279	2,506	
2014	2,253	3,570	2,506	
2015	2,330	4,191	2,506	
2016	2,667	1,665	1,249	
2017	1,765	1,665	1,249	
2018	1,183	3,047	2,285	
2019	1,344	3,047	2,285	
2020	1,053		1,752	
2021			1,752	
2022			1,752	729
2023				729
2024				729

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Possible candidate OFLs and ABCs (mt) for FY2022- FY2024 for Georges Bank cod, using a constant approach for three years.

year	OFL	ABC
2022	undefined	729
2023	undefined	729
2024	undefined	729

Allocation:
GB Cod
FY2021
with rec. catch
target of
138mt

OFL

unknown

ABC

1,752 mt

US/CA
Process in
Eastern
Management
Area

Canadian
Fishery

444.5 mt

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OFL — **unknown**

Allocation:
GB Cod
FY2021
with rec. catch
target of
138mt

ABC — **1,752 mt**

Canadian Fishery	State water fisheries	"Other" fisheries
444.5 mt	**20 mt**	**137 mt**

[Includes rec. catch target]

Subcomponents
•Expected catches
•No AM's
•No adjustment for management uncertainty

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OFL   unknown

ABC   **1,752 mt**
1,308 mt for US Fisheries

Allocation:
GB Cod
FY2021
with rec. catch
target of
138mt

Canadian Fishery	State water fisheries	"Other" fisheries
444.5 mt	**20 mt**	**137 mt**

[Includes rec. catch target]

Subcomponents
- Expected catches
- No AM's
- No adjustment for management uncertainty

Sector & Common Pool ABC

- 5% ↓ buffer

Sector & Common Pool sub-ACL

1,093 mt

Sub-ACL's
- Subject to AM's
- Management uncertainty adjustment

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Gulf of Maine Cod
Fishing Year 2022-Fishing Year 2024
OFLs and ABCs

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Figure 6- GOM cod abundance (numbers/tow) and biomass (kg/tow) trends in the MA DMF spring bottom-trawl survey (top panels), NMFS fall bottom-trawl survey (middle panels), and NMFS spring bottom-trawl survey (bottom panels).
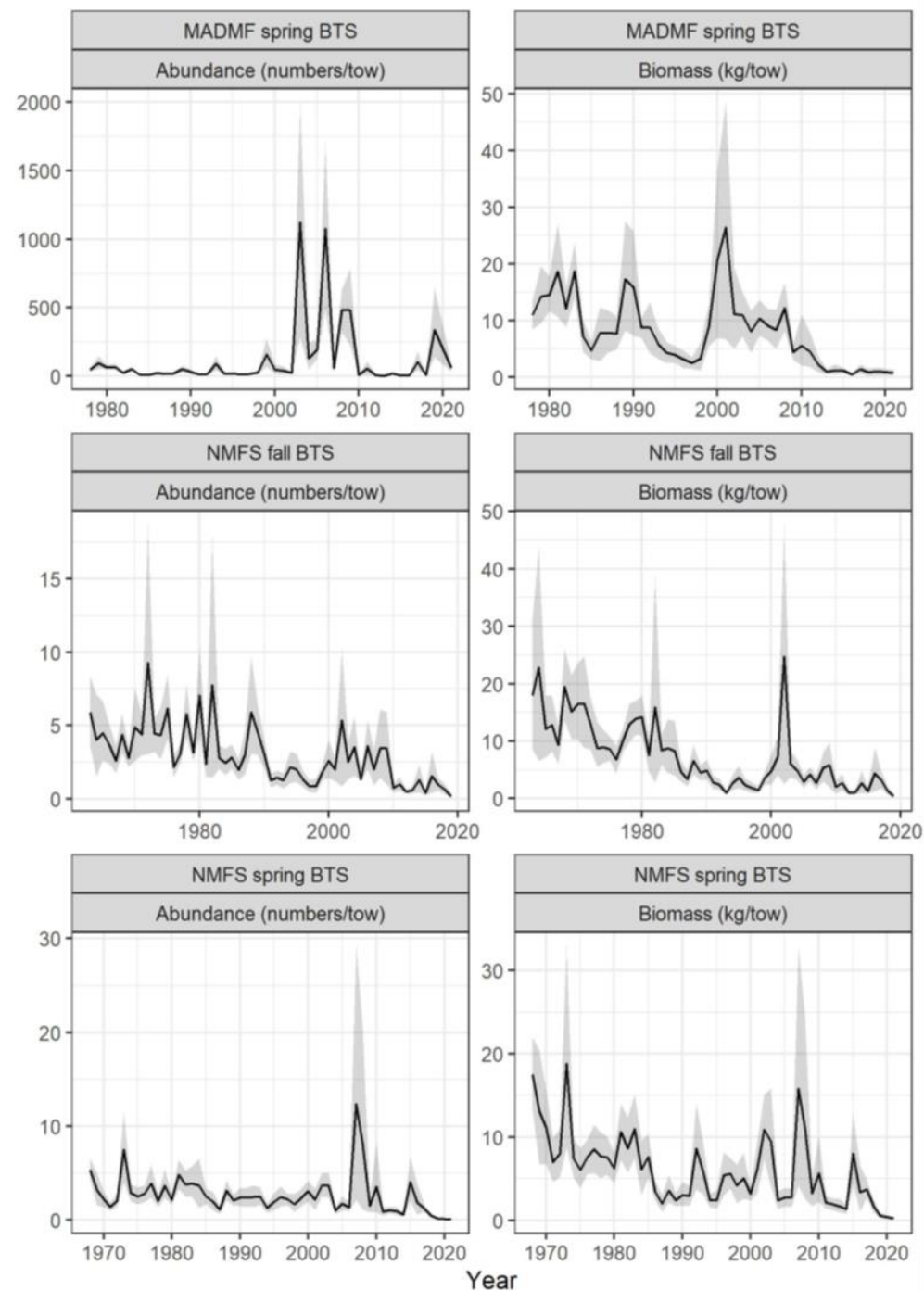
Figure 7- Normalized indices for GOM cod abundance (numbers/tow) and biomass (kg/tow) for the three surveys MA DMF spring bottom-trawl survey, NMFS fall bottom-trawl survey, and NMFS spring bottom-trawl survey.
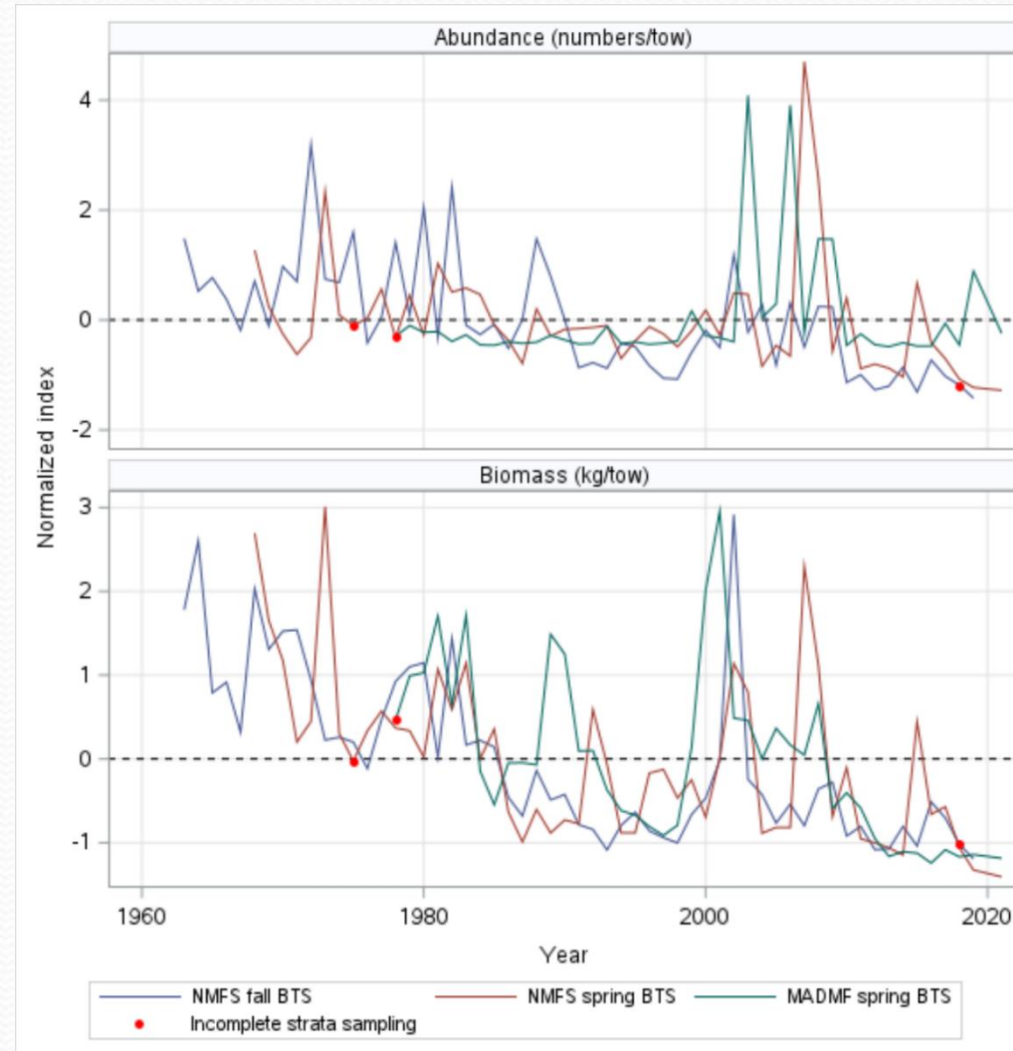
Figure 8- Catch performance for GOM cod including: catches from CY2005- CY2019, historical OFLs and ABCs since FY 2010, CY2020 and CY2021 "bridge year" catch assumptions, and projections for FY2022- FY2024 (using the M=0.2 model with retro adjustment) F_{MSY}, $75\%_{FMSY}$. Overfishing status in the terminal year of the assessment indicated on the x-axis ("Yes" = overfishing, "No" = not overfishing, and "?" = undetermined overfishing status).

Table 5- GOM cod catch performance (CY2010-CY2019) and historical OFLs and ABCs (FY2010-FY2022). Catch assumptions for the bridge years (CY2020-CY2021) and catch projections for F_{MSY} and 75%F_{MSY} (FY2022-FY2024) for M=0.2 rho adjusted and M-ramp m=0.4 models.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	M=0.2 Rho adj F_{MSY}	M=0.2 Rho adj 75%F_{MSY}	Mramp M=0.4 F_{MSY}	Mramp M=0.4 75%F_{MSY}
2010	9,100	11,089	8,530					
2011	8,007	11,715	9,012					
2012	4,204		6,700					
2013	2,723	1,635	1,550					
2014	1,806	1,917	1,550					
2015	420	514	386					
2016	850	667	500					
2017	1,171	667	500					
2018	766	938	703					
2019	497	938	703					
2020		724	552	409				
2021		929	552	523				
2022		1,150	552		821	628	892	679
2023					959	756	919	721
2024					1,244	1,001	1,071	853

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Table 6 -Projection and terminal year model results from the M=0.2 rho adjusted model and M-ramp m=0.4 model for GOM cod.

Harvest strategy	Year	Input	M=0.2 Retro adjust Catch (mt)	Spawning stock biomass (mt)	F_{full}	M-Ramp M=0.4 Catch (mt)	Spawning stock biomass (mt)	F_{full}
F_{MSY}	2019	Model result	497	3,083	0.16	497	3,223	0.17
	2020	Assumed catch	409	2,635	0.162	409	3,925	0.119
	2021	Assumed catch (ACL)	523	3,599	0.137	523	4,759	0.113
	2022	F Projection	821	4,508	0.173	892	5,254	0.175
	2023	F Projection	959	5,488	0.173	919	5,707	0.175
	2024	F Projection	1,244	7,279	0.173	1071	6,802	0.175
75% F_{MSY}	2019	Model result	497	3,083	0.16	497	3,223	0.17
	2020	Assumed catch	409	2,635	0.162	409	3,925	0.119
	2021	Assumed catch (ACL)	523	3,599	0.137	523	4,759	0.113
	2022	F Projection	628	4,549	0.13	679	5,299	0.131
	2023	F Projection	756	5,691	0.13	721	5,897	0.131
	2024	F Projection	1001	7,685	0.13	853	7,124	0.131

Figure 9- GOM cod projections using the M=0.2 model with rho adjustment for FMSY, Frebuild, 75%FMSY, and F=0, fishing mortality (top), catch (middle), and SSB (bottom).
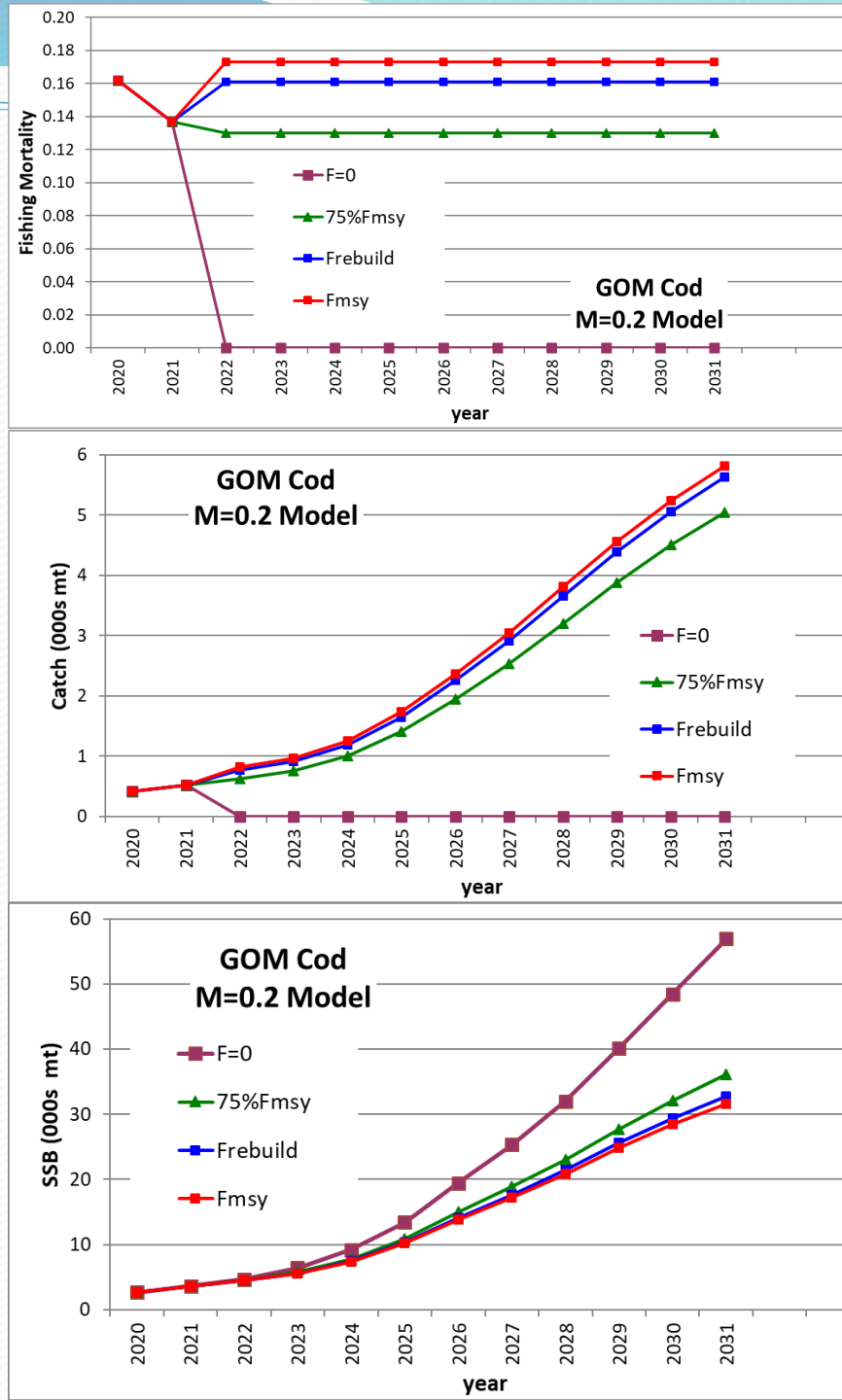
Figure 10- GOM cod projections using the M-ramp M=0.4 model for FMSY, Frebuild, 75%FMSY, and F=0, fishing mortality (top), catch (middle), and SSB (bottom).
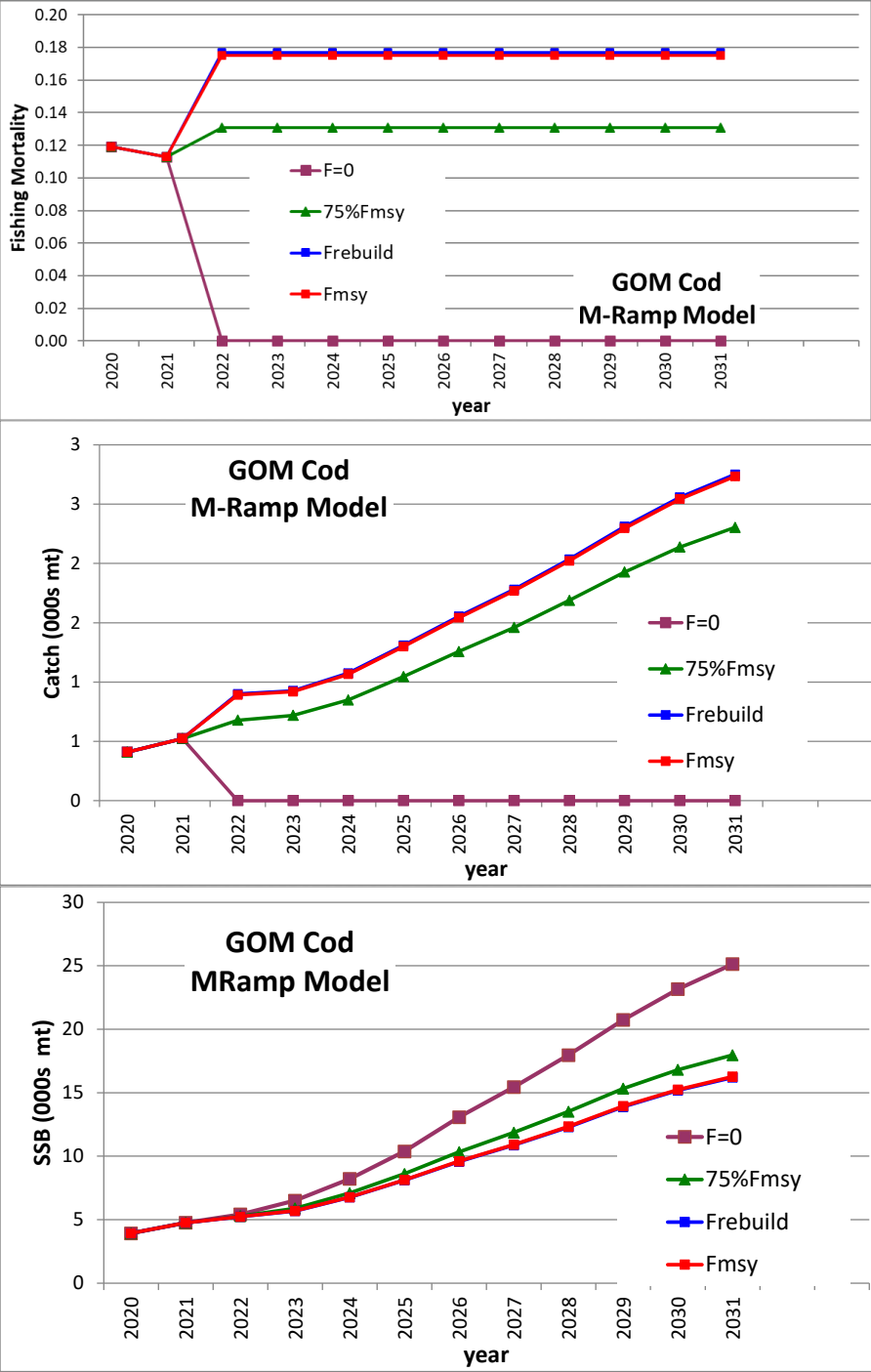
Figure 11- GOM cod - comparison of 75%FMSY projections with different recruitment assumptions for the M=0.2 model with rho adjustment (top) and M-ramp M=0.4 model (bottom). Differences in catch (mt) due to the recruitment assumption from 2022 through 2024 is given in the boxes.
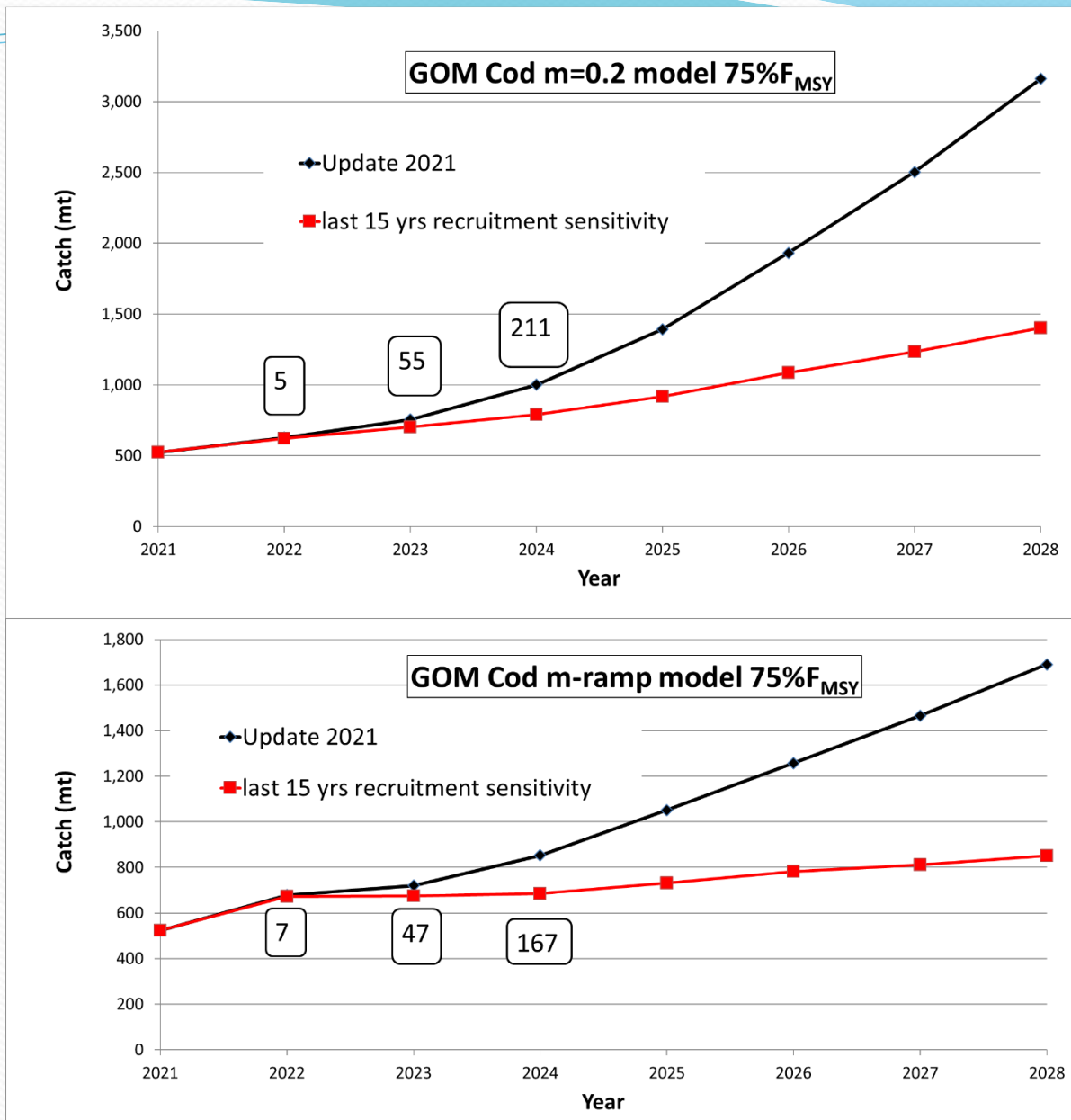
Table 9- GOM cod - comparison of projections with different recruitment assumptions. 2020 and 2021 are bridge years. See Figure 10.

	M=0.2 Update 2021	mramp Update 2021	M=0.2 last 15 yrs recruitment sensitivity	mramp last 15 yrs recruitment sensitivity
2020	*409*	*409*	*409*	*409*
2021	*523*	*523*	*523*	*523*
2022	628	679	623	672
2023	756	721	701	674
2024	1001	853	790	686
2025	1393	1052	918	731
2026	1931	1258	1086	783
2027	2503	1466	1234	812
2028	3161	1691	1404	851

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Table 8- GOM cod sensitivity projection runs for the M=0.2 rho adjusted model and M-ramp m=0.4 model at 75%F_{MSY} using one bridge year (CY2020). The average of the two results is also provided. This sensitivity suggests that the increase in the ABC (~100 mt) is calculated from the additional bridge year catch assumption within the projection.

year	M=0.2 Rho adj 75%F_{MSY}	Mramp M=0.4 75%F_{MSY}	avg
2021	497	605	551

Table 5- GOM cod catch performance (CY2010-CY2019) and historical OFLs and ABCs (FY2010-FY2022). Catch assumptions for the bridge years (CY2020-CY2021) and catch projections for F_{MSY} and $75\%F_{MSY}$ (FY2022-FY2024) for M=0.2 rho adjusted and M-ramp m=0.4 models.

Year	Catch	Historical OFLs	Historical ABCs	Catch Assumption	M=0.2 Rho adj F_{MSY}	M=0.2 Rho adj $75\%F_{MSY}$	Mramp M=0.4 F_{MSY}	Mramp M=0.4 $75\%F_{MSY}$
2010	9,100	11,089	8,530					
2011	8,007	11,715	9,012					
2012	4,204		6,700					
2013	2,723	1,635	1,550					
2014	1,806	1,917	1,550					
2015	420	514	386					
2016	850	667	500					
2017	1,171	667	500					
2018	766	938	703					
2019	497	938	703					
2020		724	552	409				
2021		929	552	523				
2022		1,150	552		821	628	892	679
2023					959	756	919	721
2024					1,244	1,001	1,071	853

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Table 7- GOM cod - calculation of possible candidate OFLs and ABCs for GOM cod using the M=0.2 rho adjusted model and M-ramp m=0.4 model. A constant OFL candidate of 857 (box in table) could be considered.

year	M=0.2 Rho adj OFL	Mramp M=0.4 OFL	Avg OFL	ABC
2022	821	892	857	654
2023	986	951	969	654
2024	1326	1134	1230	654

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Possible candidate OFLs and ABCs (mt) for FY2022- FY2024 for Gulf of Maine cod, considers M=0.2 rho adjusted and M-ramp M=0.4, uses a constant approach for three year on the ABC with two options for OFLs

year	OFL (a)	OFL (b)	ABC
2022	857	857	654
2023	969	857	654
2024	1,230	857	654

Table 12 shows discards for all fisheries and non-groundfish and state landings for GOM cod, which in total is 391.2 mt for 2018 and 154.9 mt for 2019. It is important to note that these values do not necessarily represent all incidental, non-target catch under the current prevailing operating conditions of the fishery, as GOM cod can be caught incidentally, but legally landed by vessels in the federal groundfish fishery.

Table 12- Summary of total discards (in all fisheries) plus non-groundfish and state landings for GOM cod. Source: FY2018 –FY2019 year-end catch reports and 2021 Gulf of Maine cod stock assessment.

	2018 (mt)				2019 (mt)			
	Total Discards	Non-Groundfish Fishery Landings	State Landings	2018 Total	Total Discards	Non-Groundfish Fishery Landings	State Landings	2019 Total
Commercial	9.8	3.7	37.7	51.2	14.8	0.6	28.5	43.9
Recreational	340	-	-	340	111	-		111
Total	349.8	3.7	37.7	391.2	125.8	0.6	28.5	154.9

Sources:
Commercial landings from FY2018 and FY2019 fishing year-end reports
Recreational discards (note on a calendar-year basis, which includes the new MRIP values) from the 2021 Management Track Assessment
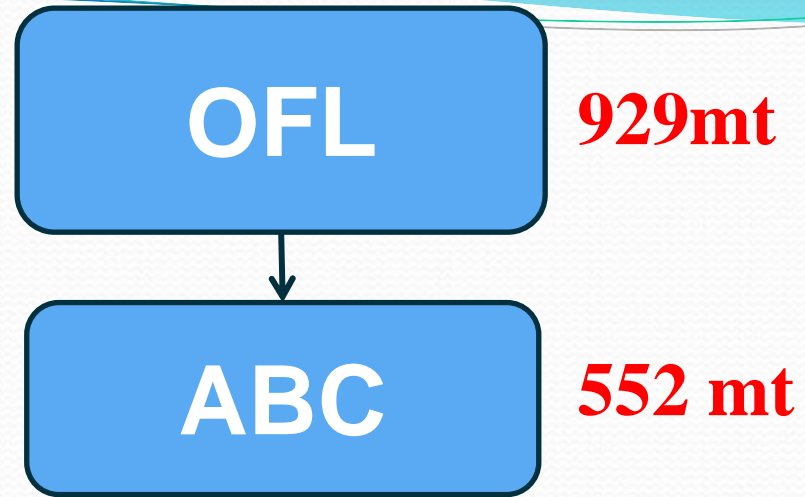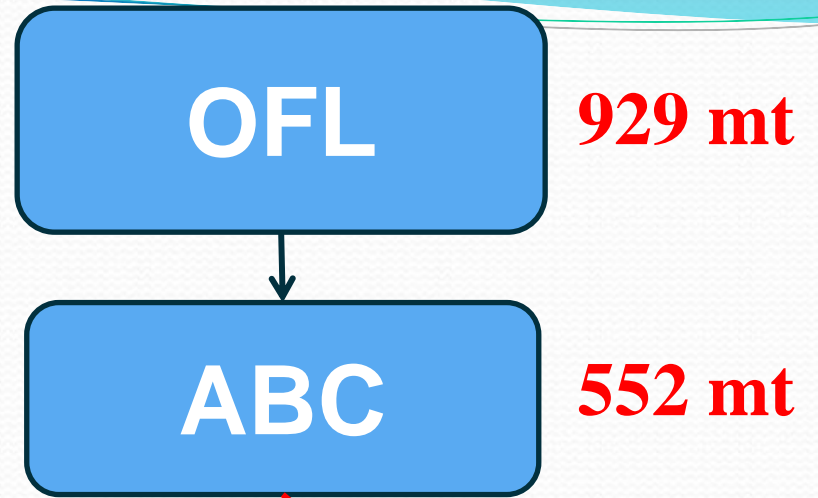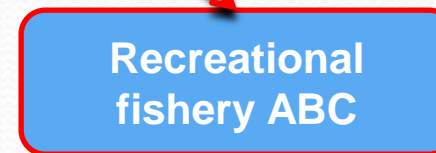
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Allocation:
GOM Cod
FY2021

OFL

929mt

ABC

552 mt

Allocation:
GOM Cod
FY2021

OFL   **929 mt**

ABC   **552 mt**

37.5% allocation

Recreational fishery ABC

- 7%   **buffer**

Recreational fishery sub-ACL

193 mt

<u>**Sub-ACL's**</u>
- Subject to AM's
- Management uncertainty adjustment

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Allocation:
GOM Cod
FY2021

OFL — **929 mt**

ABC — **552 mt**

State water fisheries — **48 mt**

"Other" fisheries — **12 mt**

Recreational fishery ABC

Recreational fishery sub-ACL — **193 mt**

Subcomponents
•Expected catches
•No AM's
•No adjustment for management uncertainty

Sub-ACL's
•Subject to AM's
•Management uncertainty adjustment

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Allocation:
GOM Cod FY2021

OFL — **929 mt**

ABC — **552 mt**

State water fisheries — **48 mt**

"Other" fisheries — **12 mt**

Recreational fishery ABC — 7% buffer → Recreational fishery sub-ACL — **193 mt**

Sector & Common Pool ABC — 5% buffer → Sector & Common Pool sub-ACL — **270 mt**

Subcomponents
• Expected catches
• No AM's
• No adjustment for management uncertainty

Sub-ACL's
• Subject to AM's
• Management uncertainty adjustment

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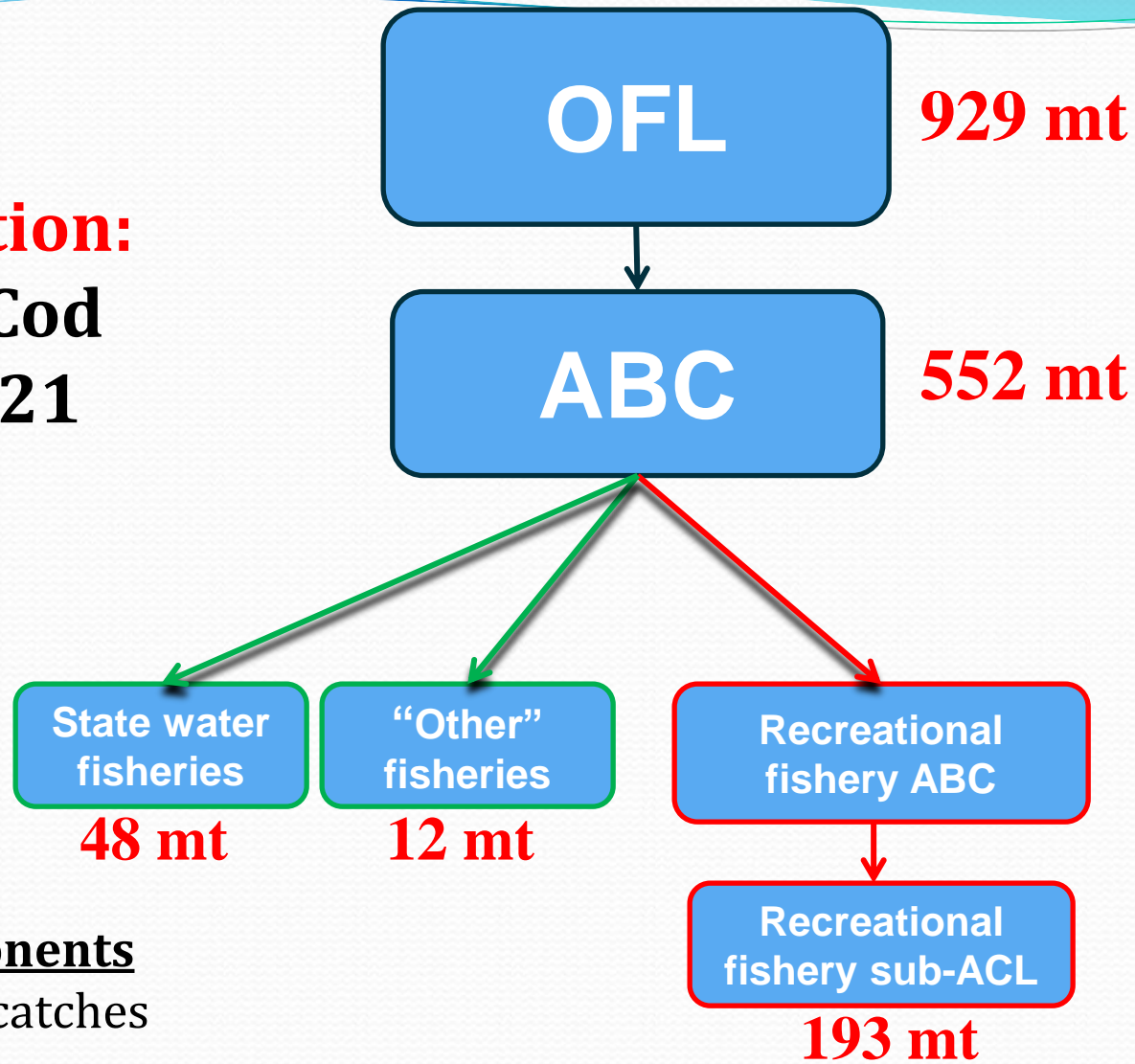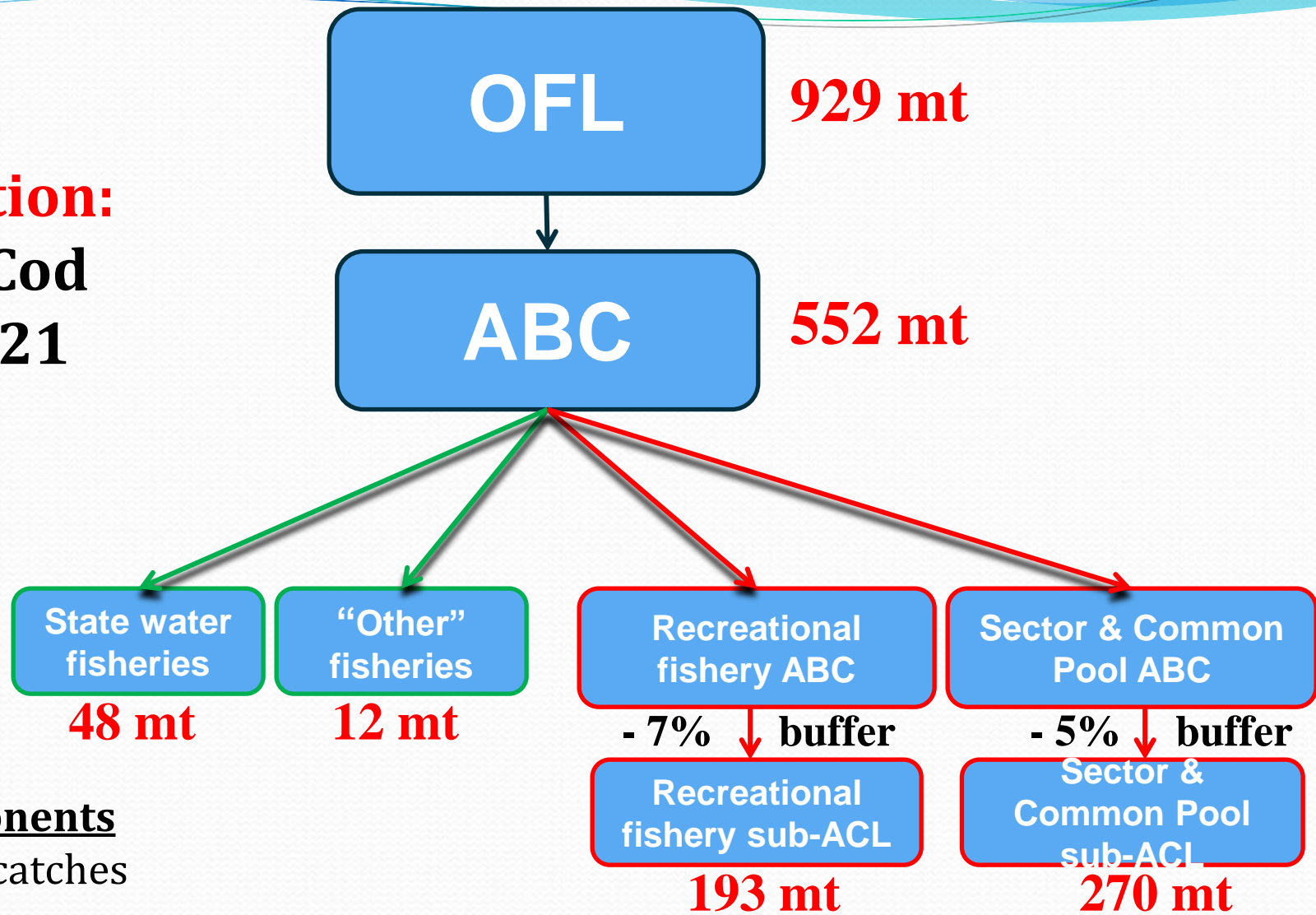
White Hake
Fishing Year
OFL and ABC

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Figure 1- Stratified mean survey indices for white hake from the NMFS fall and spring bottom-trawl surveys, updated since the 2019 assessment.
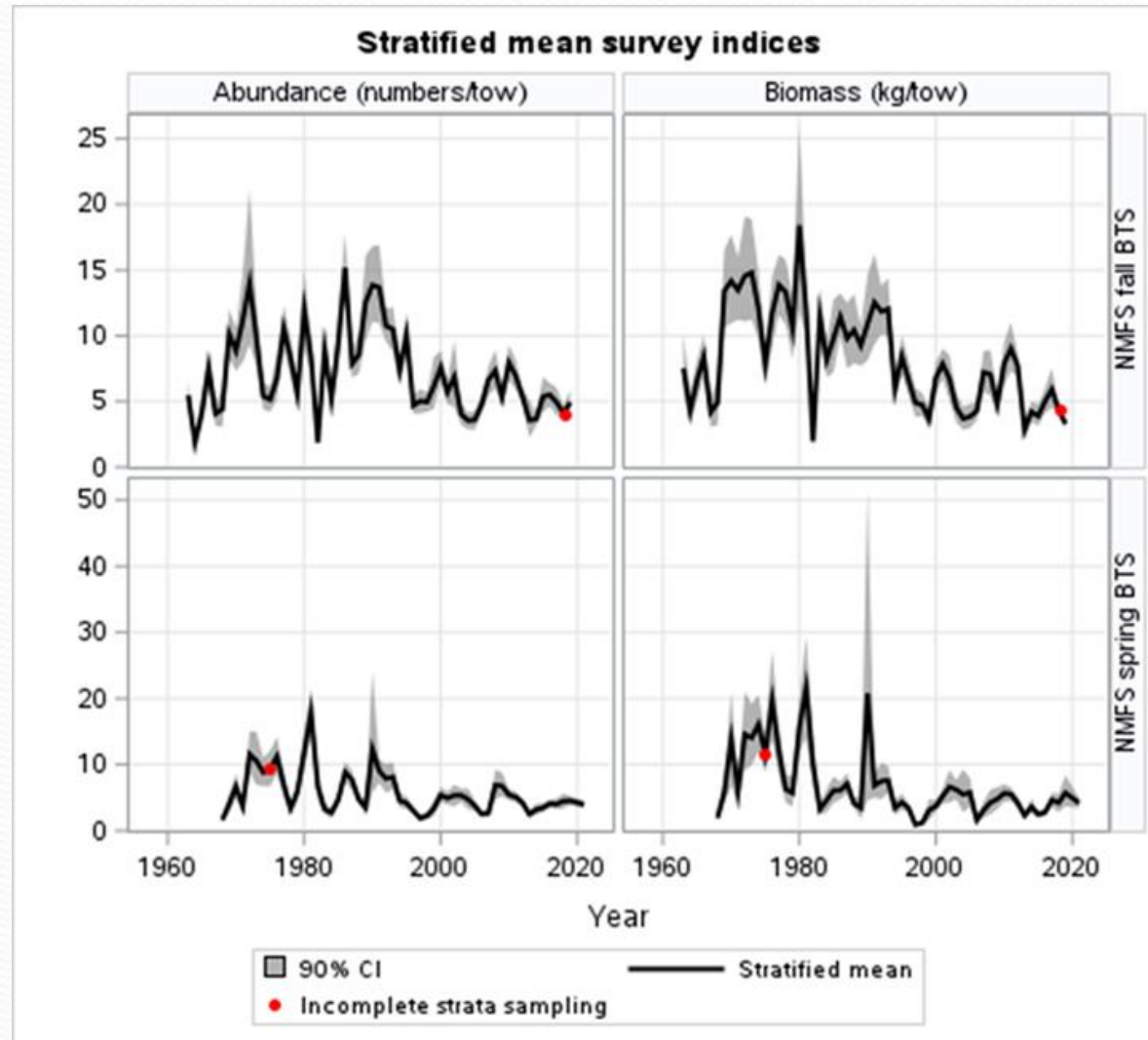
Figure 2– In-season utilization of white hake by the commercial (sectors and common pool) groundfish fishery.
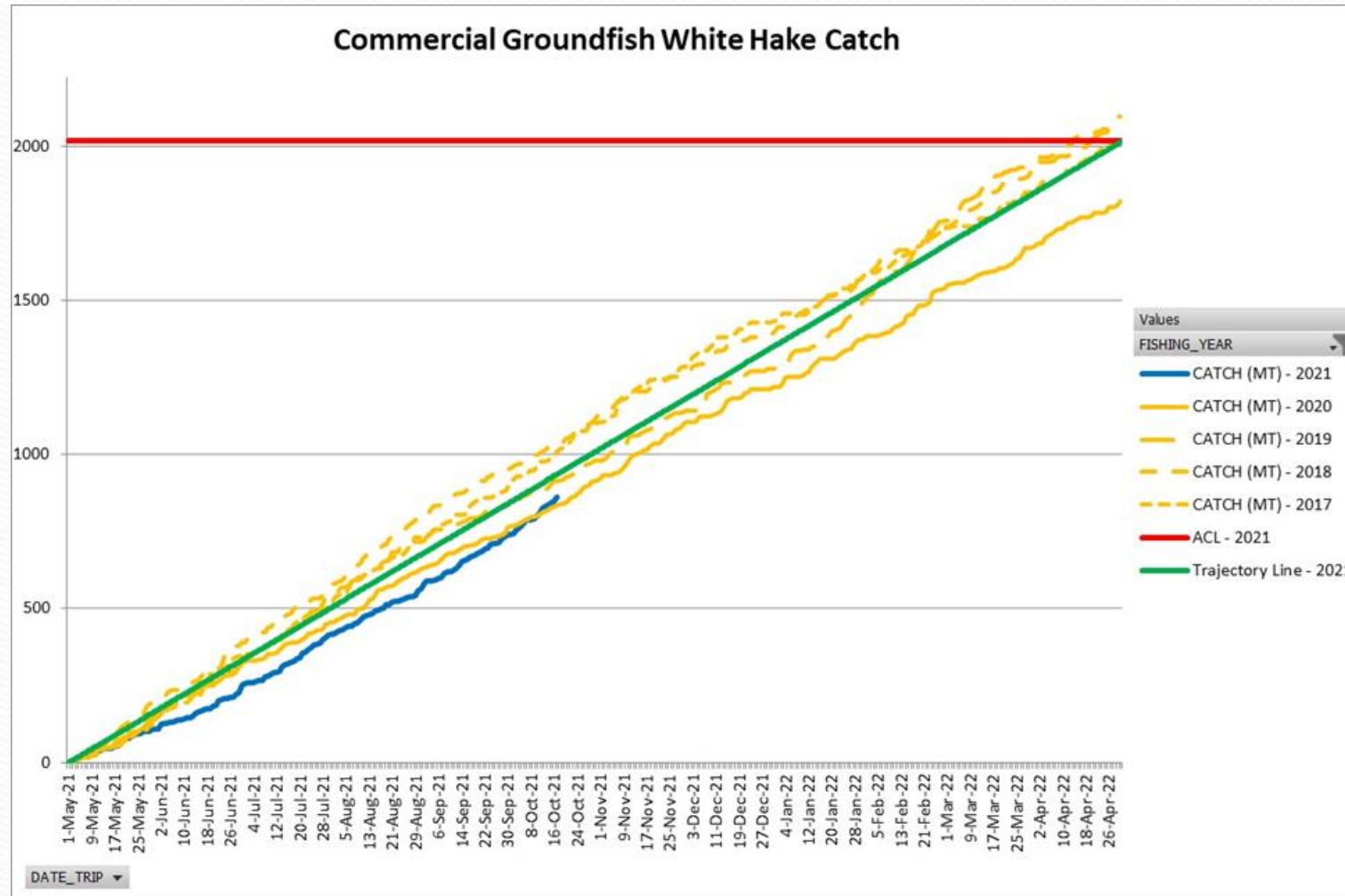
Figure 3– ACE lease prices estimated for white hake for fishing years 2015-2019 using a hedonic price model. First quarter (May-July) lease prices are indicated by the vertical gray bars in the figures.
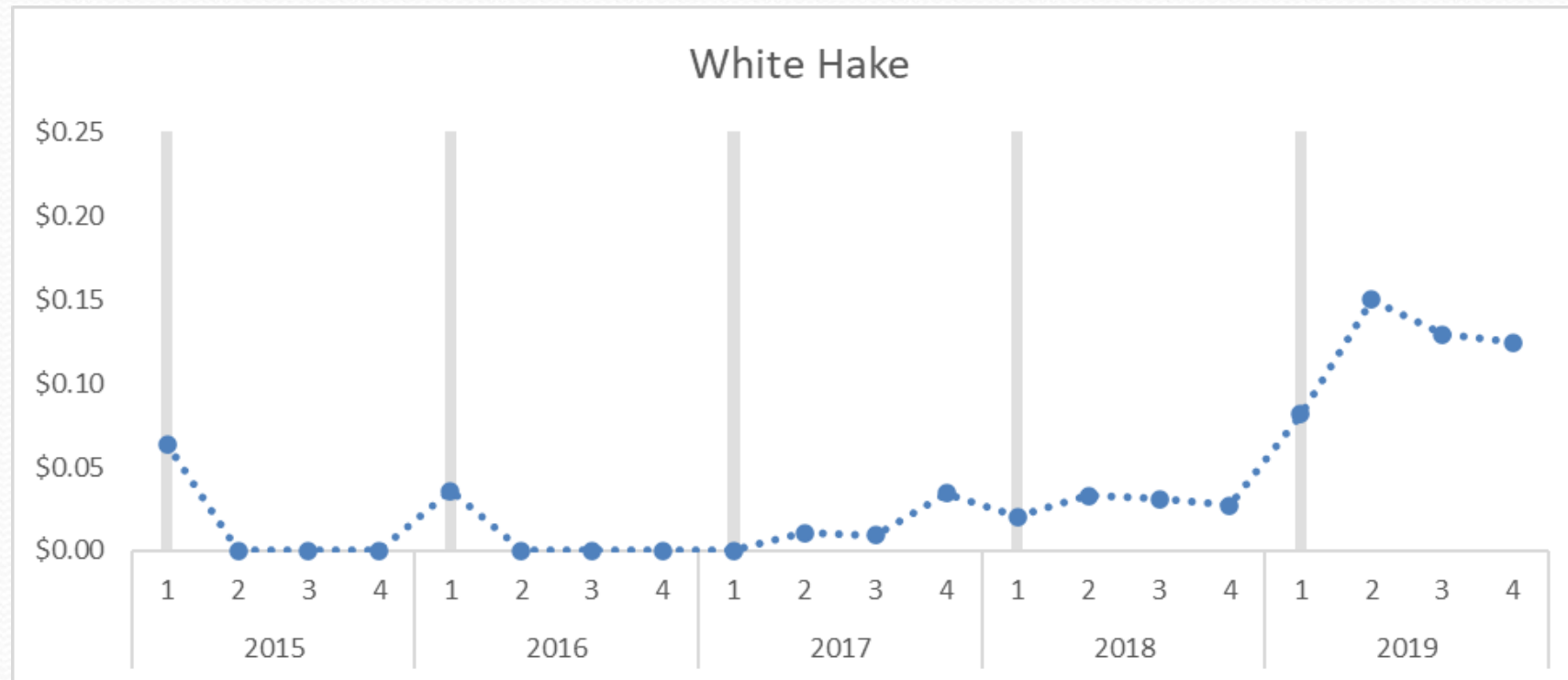
Table 1- Stock-level catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2011 and 2020 compared to realized catch and revenue (in 2020$) for white hake.

	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

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Possible candidate OFL and ABC (mt) for FY2022 for white hake, under 70%FMSY projections (Frebuild).

year	OFL	ABC
2022	3,022	2,155

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

Georges Bank Haddock & Gulf of Maine Haddock
Fishing Year
OFLs and ABCs

Figure 1- Stratified mean survey indices for GOM haddock, from the NMFS fall and spring bottom-trawl surveys, updated since the 2019 assessment.
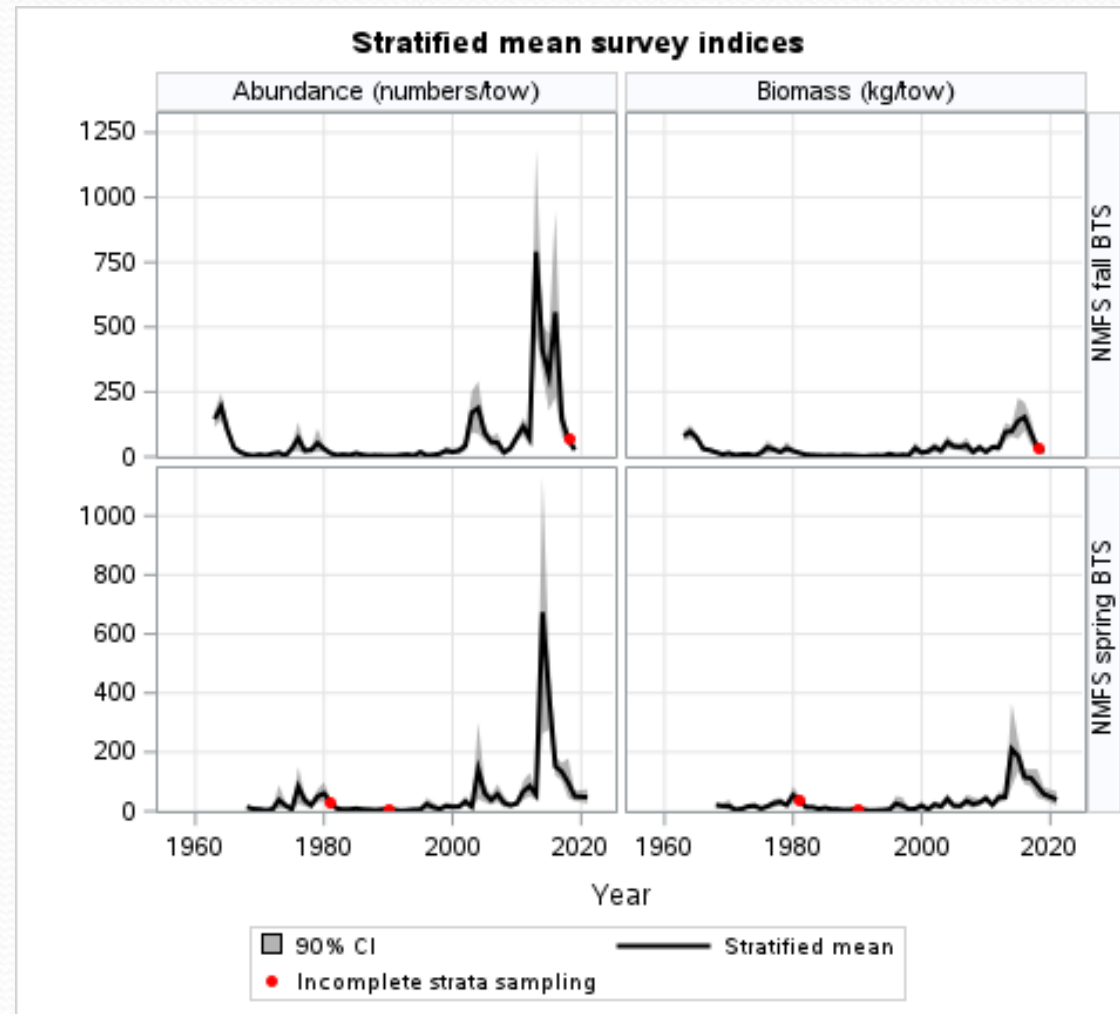
Figure 2- Survey length frequencies for GOM haddock, updated since the 2019 assessment. Note that no spring NMFS bottom trawl survey occurred in 2020.
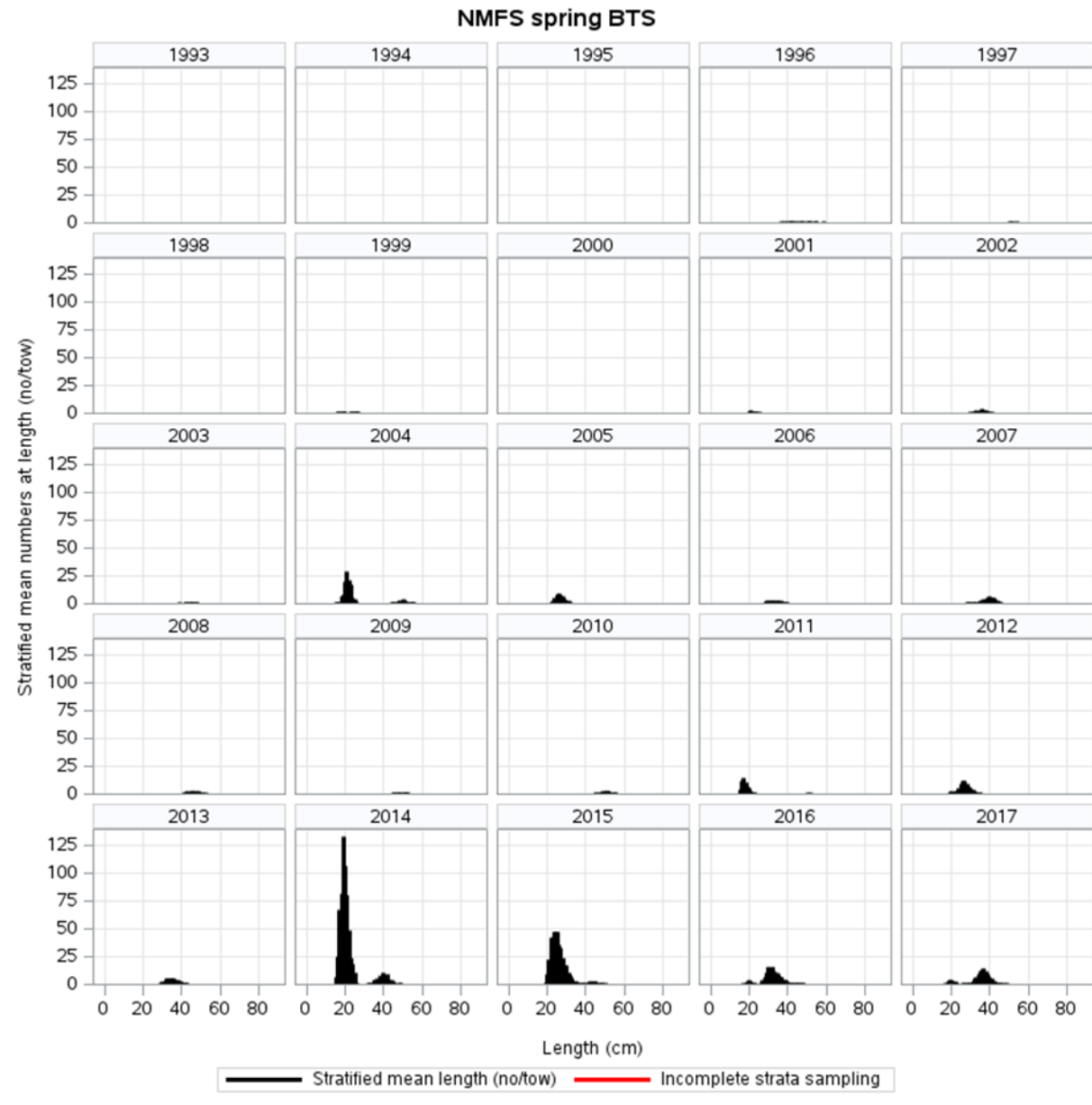
Figure 2- Survey length frequencies for GOM haddock, updated since the 2019 assessment. Note that no spring NMFS bottom trawl survey occurred in 2020.
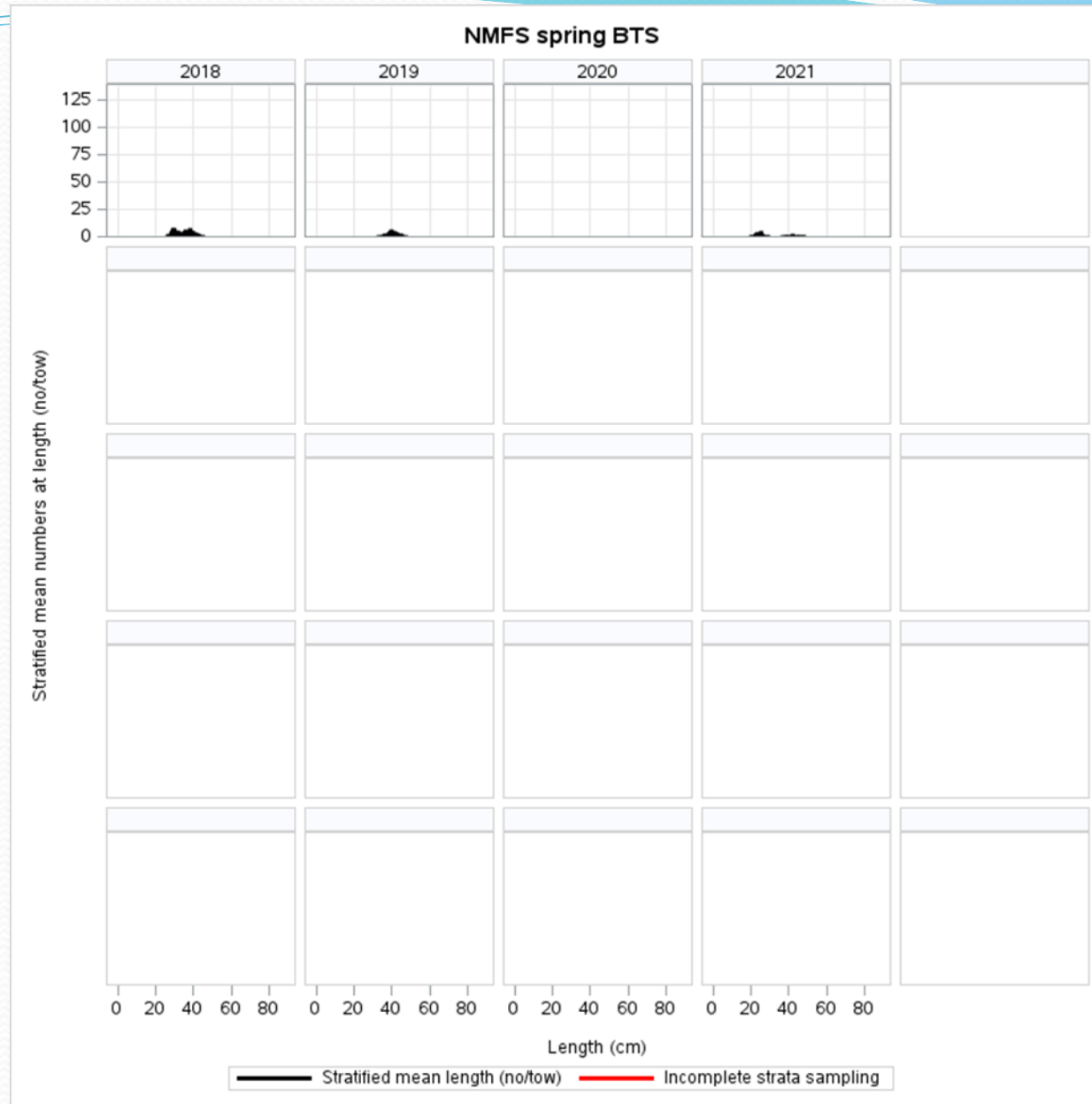
Figure 3- Stratified mean survey indices for GB haddock from the NMFS fall and spring bottom-trawl surveys, updated since the 2019 assessment.
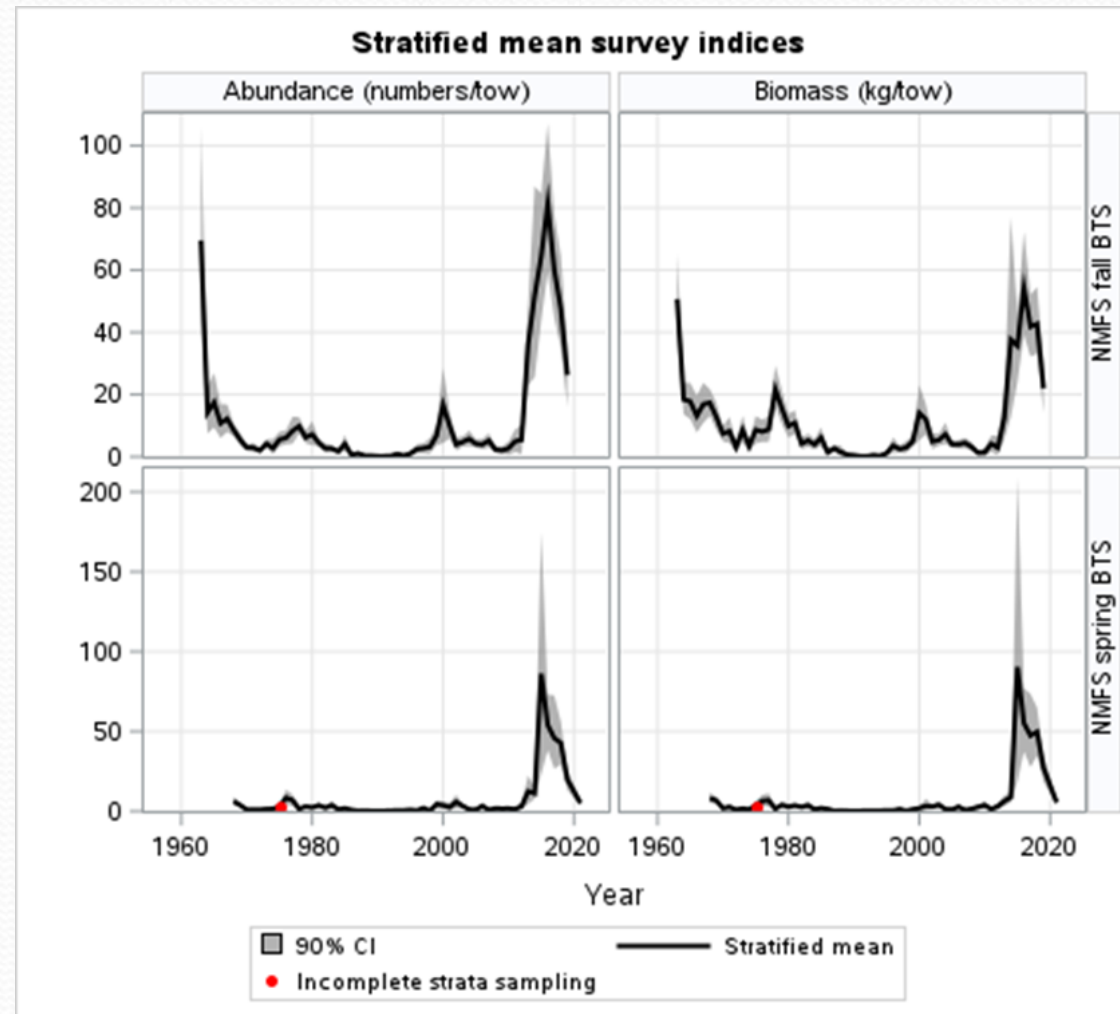
Figure 4- Survey length frequencies for GB haddock, updated since the 2019 assessment. Note that no spring NMFS bottom trawl survey occurred in 2020.
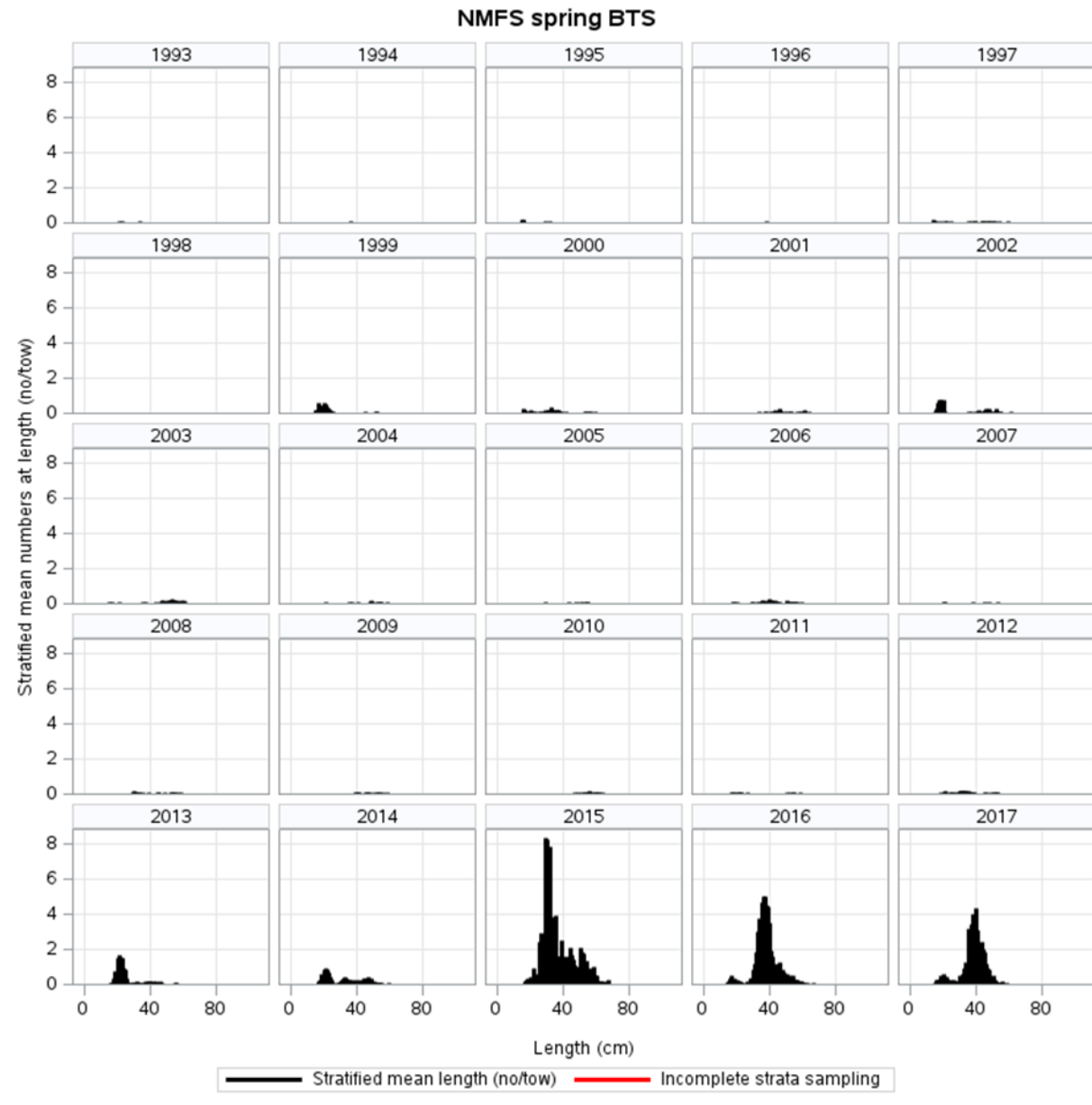
Figure 4- Survey length frequencies for GB haddock, updated since the 2019 assessment. Note that no spring NMFS bottom trawl survey occurred in 2020.
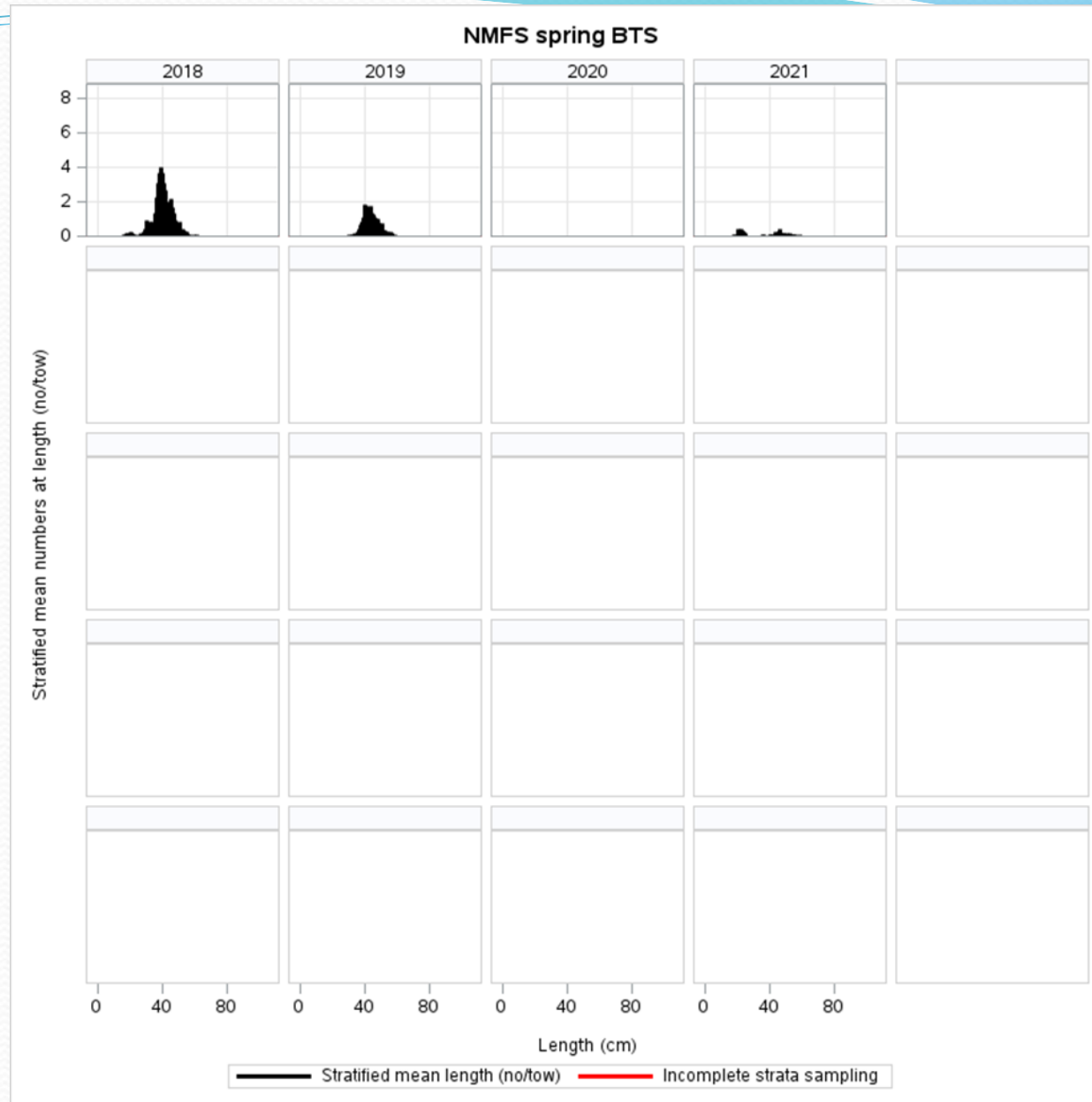
Figure 6- In-season utilization of GOM haddock by the commercial (sectors and common pool) groundfish fishery.
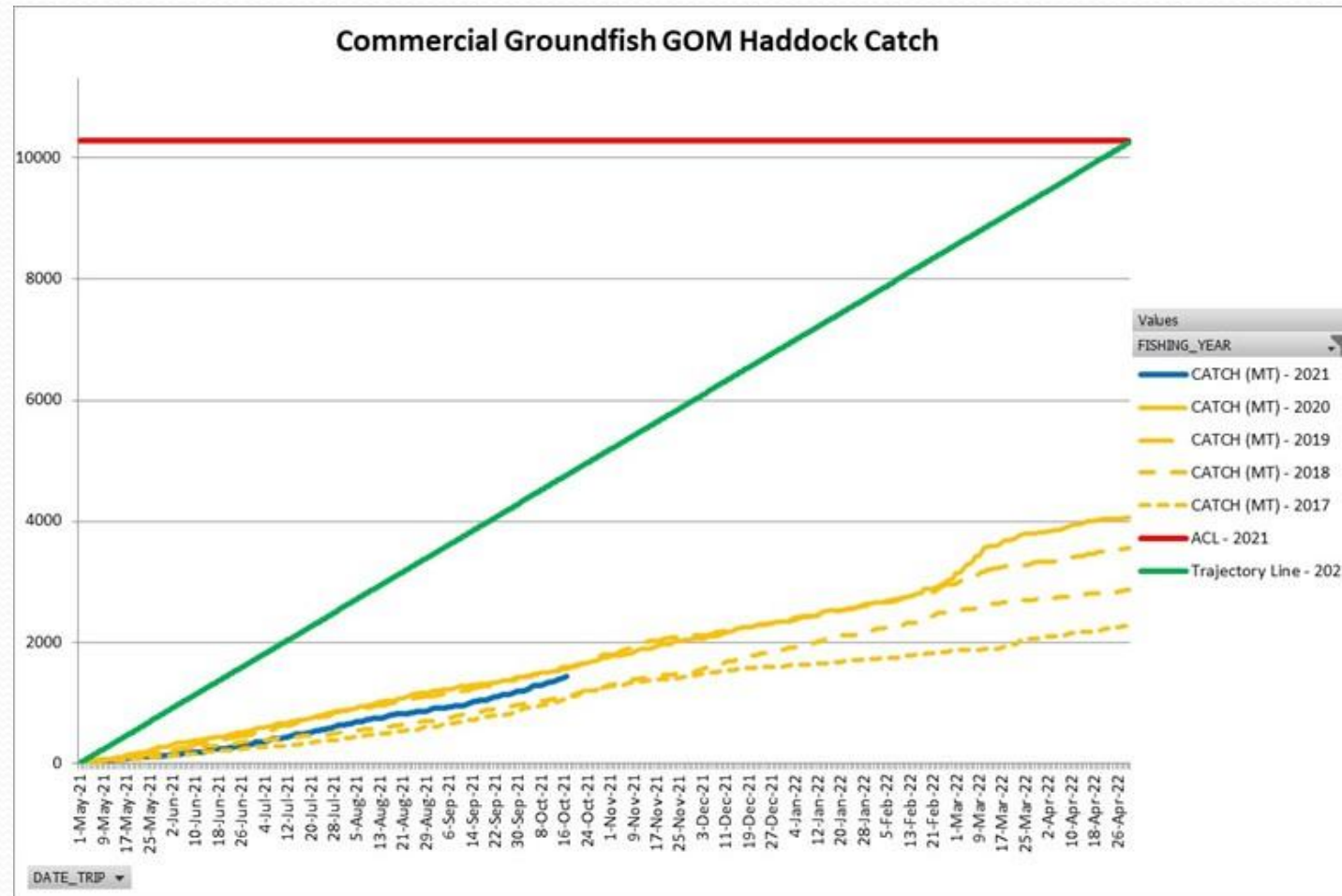
Figure 5- In-season utilization of GB haddock by the commercial (sectors and common pool) groundfish fishery.
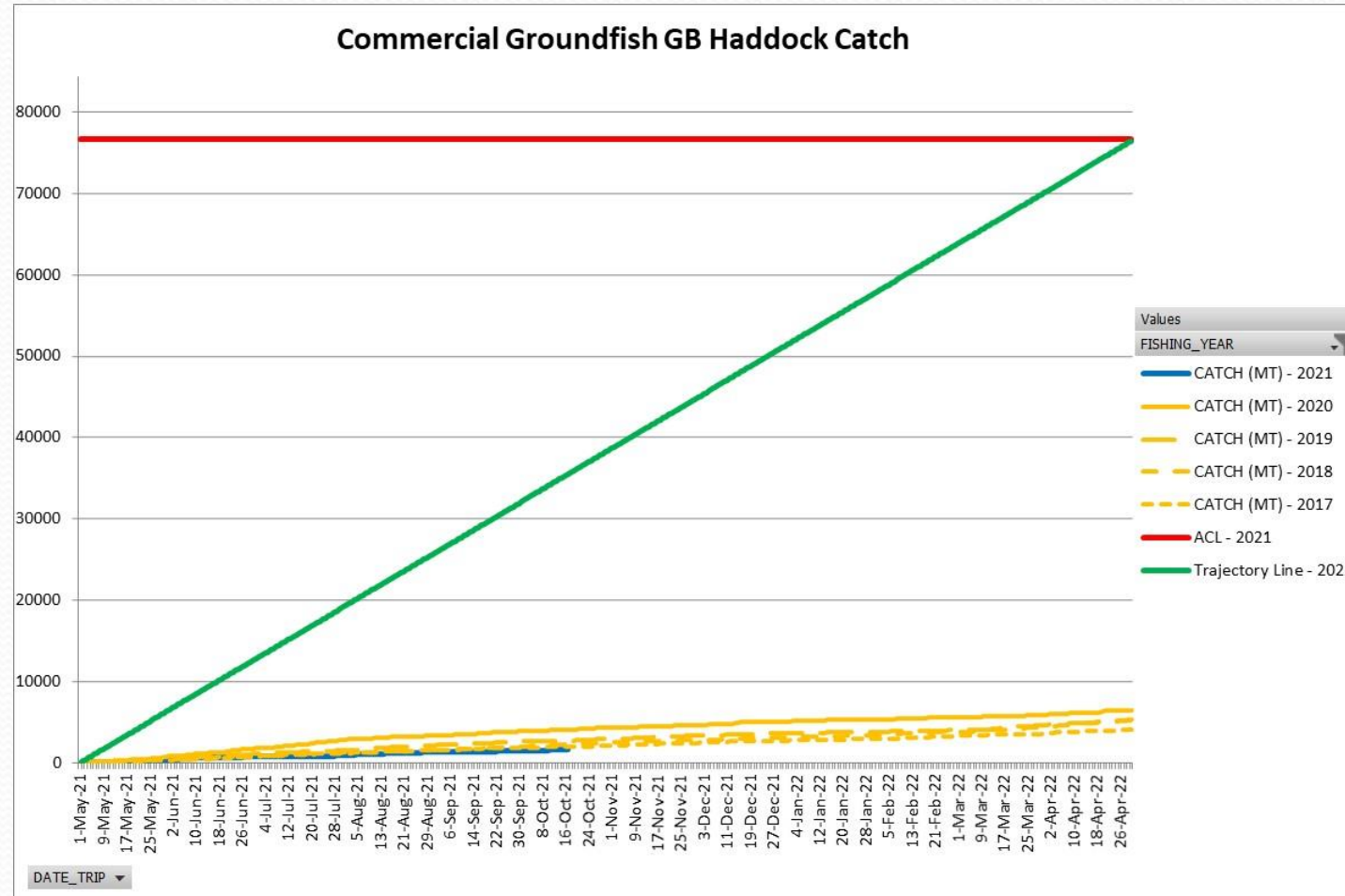
Figure 7- ACE lease prices estimated for GOM haddock for fishing years 2015-2019 using a hedonic price model. First quarter (May-July) lease prices are indicated by the vertical gray bars in the figure.
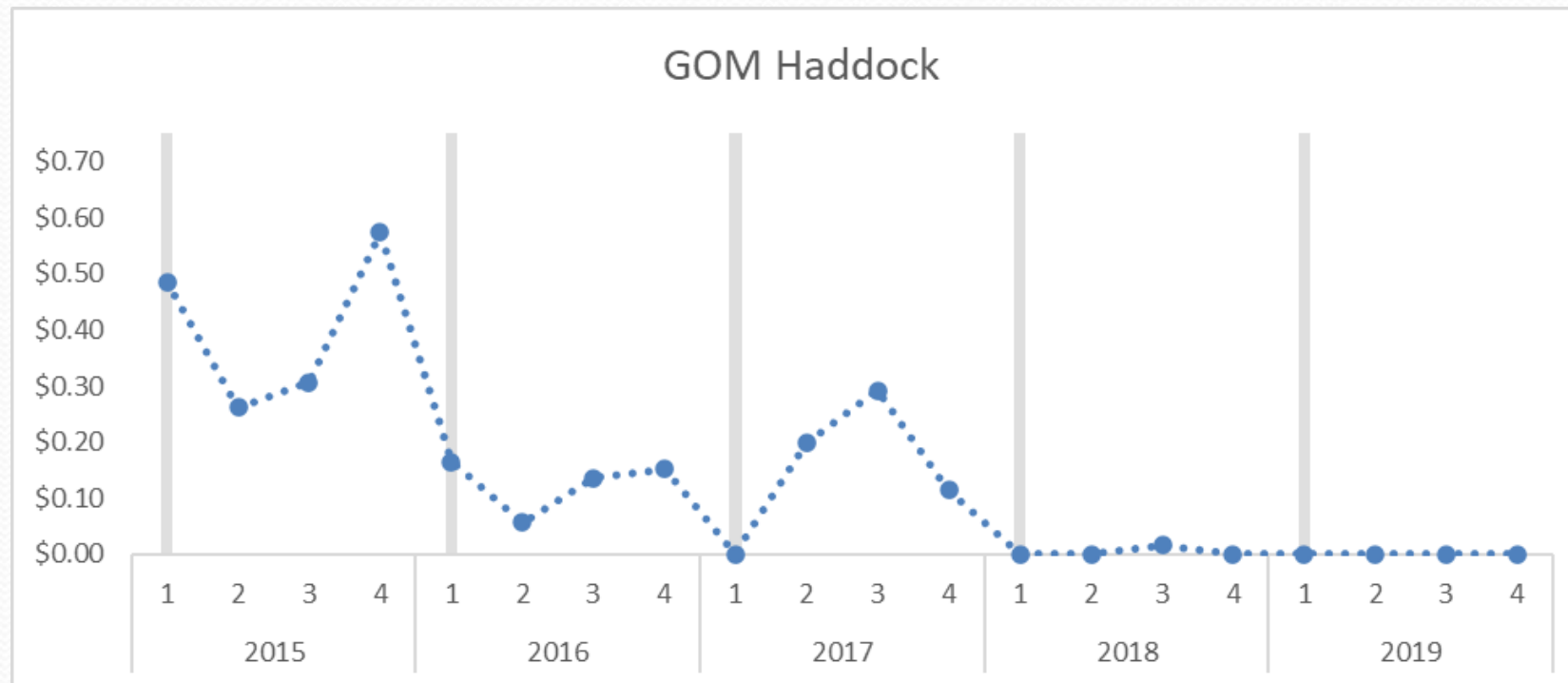
Table 3- GB haddock catch and revenue predictions from the Quota Change Model (QCM) for each fishing year between 2011 and 2020 compared to realized catch and revenue (in 2020$).

	FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev ($mil, 2020)	
			Realized	Predicted	Realized	Predicted	Realized	Predicted
GB Haddock	2011	21,515	2,766	8,546	0.13	0.40	9.9	24.6
	2012	19,251	626	2,211	0.03	0.11	3.2	7.5
	2013	24,908	2,167	1,601	0.09	0.06	6.5	5.7
	2014	18,666	3,523	793	0.19	0.04	9.4	3.1
	2015	16,206	3,293	4,495	0.20	0.28	8.5	12.7
	2016	34,156	3,006	4,511	0.09	0.13	7.8	10.5
	2017	22,968	3,208	4,787	0.14	0.21	6.5	10.8
	2018	28,857	4,135	3,628	0.14	0.13	8	7.9
	2019	38,003	4,368	4,160	0.11	0.11	9.2	7.5
	2020	103,849	5,783	4,426	0.06	0.04	12.4	7.8

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Table 4- GOM haddock 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$).

	FY	Sector sub-ACL	Catch (mt)		Utilization (%)		Gross Rev ($mil, 2020)	
			Realized	Predicted	Realized	Predicted	Realized	Predicted
GOM Haddock	2011	778	469	417	0.60	0.54	2.3	2.1
	2012	648	208	370	0.32	0.57	1.3	1.9
	2013	251	148	177	0.59	0.71	0.7	0.9
	2014	218	293	167	1.34	0.76	1.1	0.9
	2015	948	681	124	0.72	0.13	2.1	0.4
	2016	2,385	1,500	365	0.63	0.15	4.8	1.2
	2017	2,985	2,161	1,383	0.72	0.46	5.4	4
	2018	8,643	2,791	1,995	0.32	0.23	6.5	6.1
	2019	8,219	3,452	2,964	0.42	0.36	8.3	7.2
	2020	11,918	3,992	2,734	0.33	0.23	9.7	6.3

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Table 1- Current specifications for GOM haddock.

FY	OFL	ABC
2020	25,334	19,696
2021	21,521	16,794
2022	14,834	11,526

Table 2- Current specifications for GB haddock.

FY	OFL	ABC
2020	184,822	131,567
2021	116,883	82,723
2022	114,925	81,242

Additional Slides

TMGC/SC Recommendations for FY2022

Eastern GB cod – 571 mt with 160 mt for U.S. and 411 mt for Canada

Eastern GB haddock- 14,100 mt with 6,627 mt for U.S. and 7,473 mt for Canada

GB yellowtail flounder – 200 mt with 122 mt for U.S. and 78 mt for Canada

Atlantic Cod Status

<u>Stock Status and Rebuilding</u>

- Stock assessments for the Gulf of Maine cod stock and the Georges Bank cod stock generally occur every two years.

- Eastern Georges Bank cod management unit is assessed annually.

- Based on 2019 assessments, the Gulf of Maine cod and Georges Bank cod stocks are overfished with overfishing occurring, and subject to rebuilding plans with rebuild by dates of 2024 and 2026, respectively.

- The stock status of cod in the Eastern Georges Bank management unit is poor and subject to a rebuilding plan in Canada.

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Atlantic Cod Management Overview

<u>Northeast Multispecies (Groundfish) Fishery Management Plan</u>
- 13 species, 20 stocks, and 2 management units
- Complex management system
  - Atlantic Cod
    - 2 stocks: Georges Bank Cod and Gulf of Maine Cod
      - Transboundary Management Unit US/Canada – Eastern Georges Bank Cod

  - Commercial (sectors and common pool) and recreational catches
    - Limits – catch limits and associated management measures
    - Closures – protection, spawning, and habitat closures

International – United States and Canada

Eastern Georges Bank Cod Management
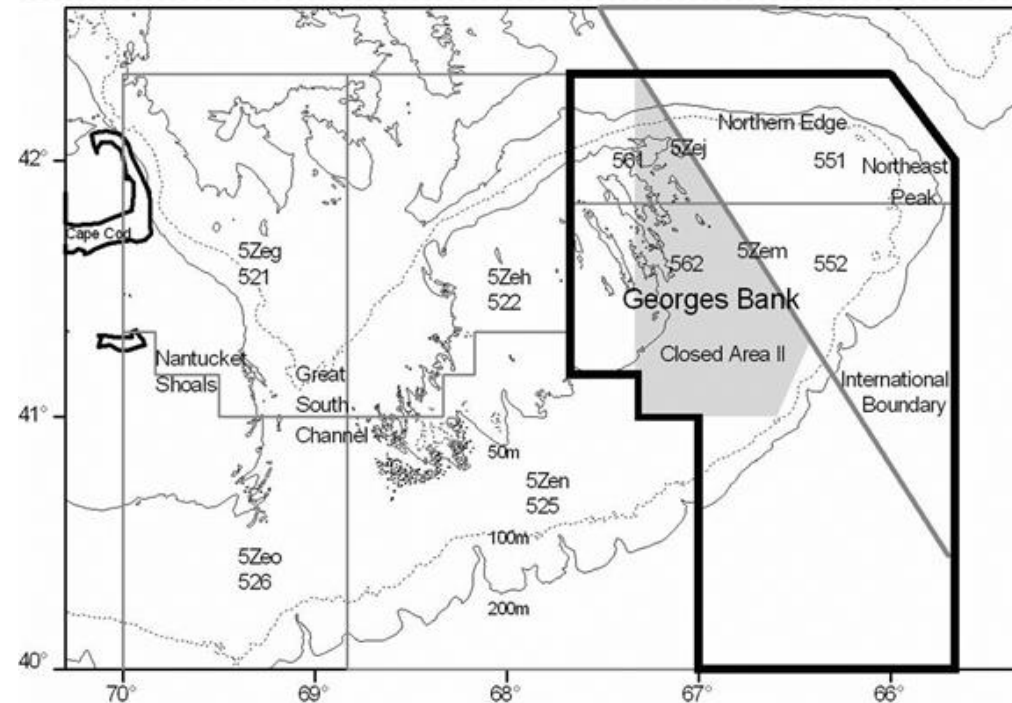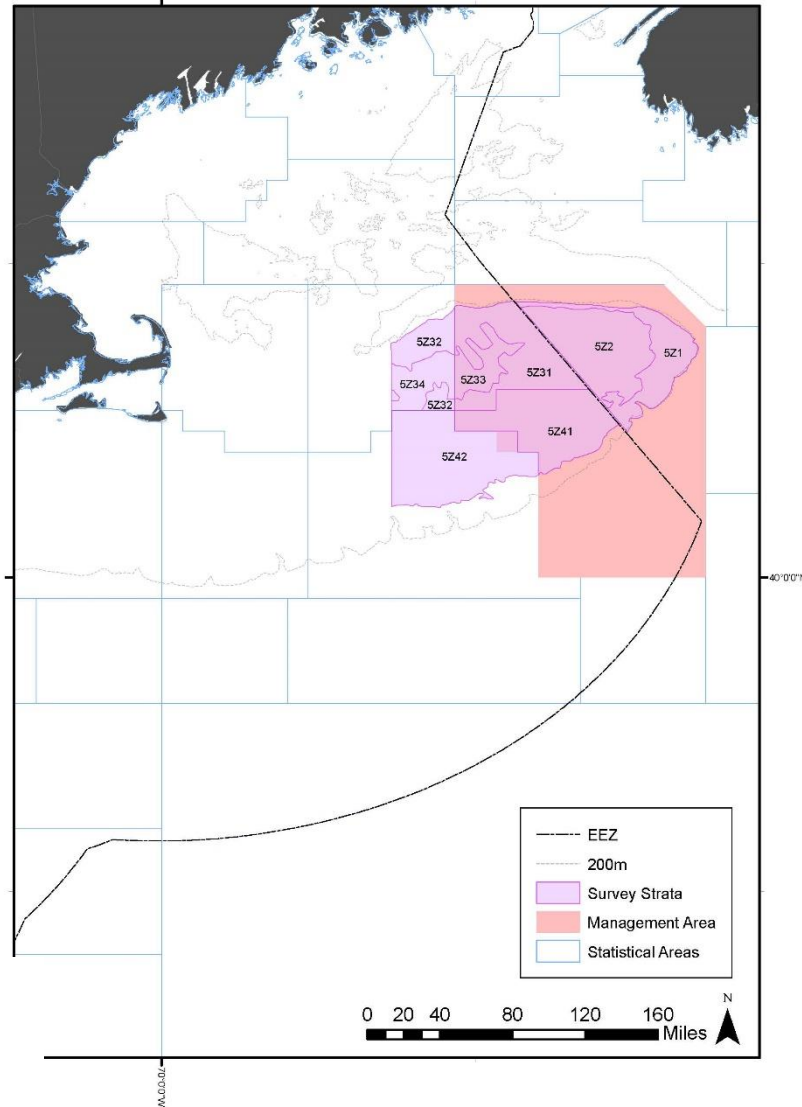
GOM Cod Protection Closures
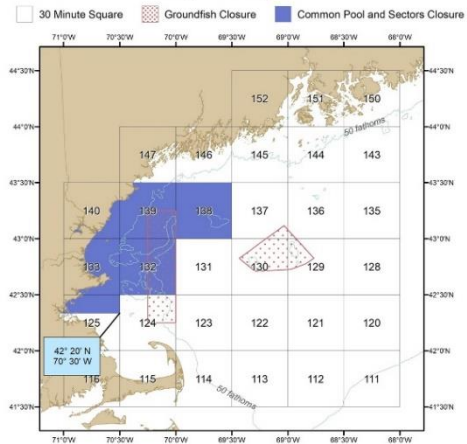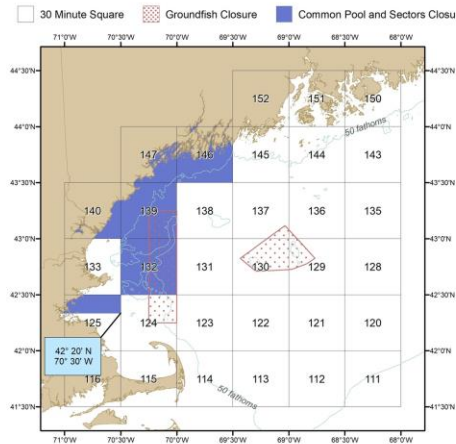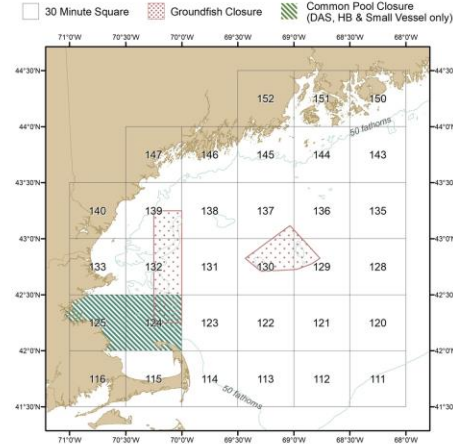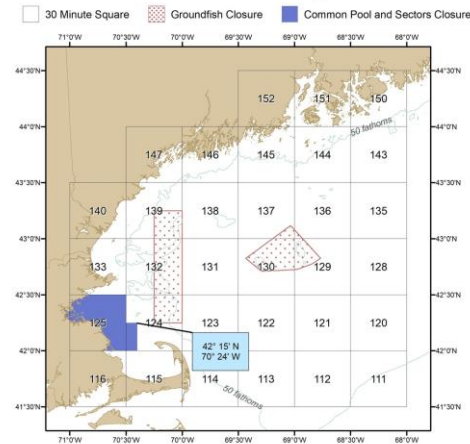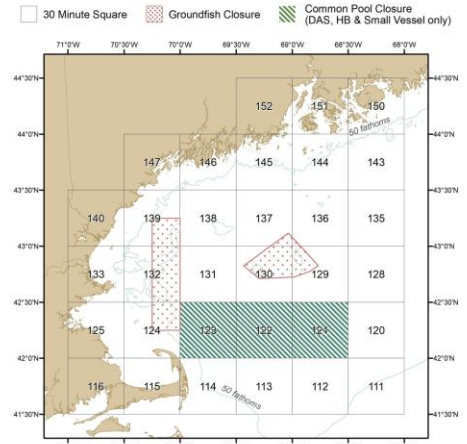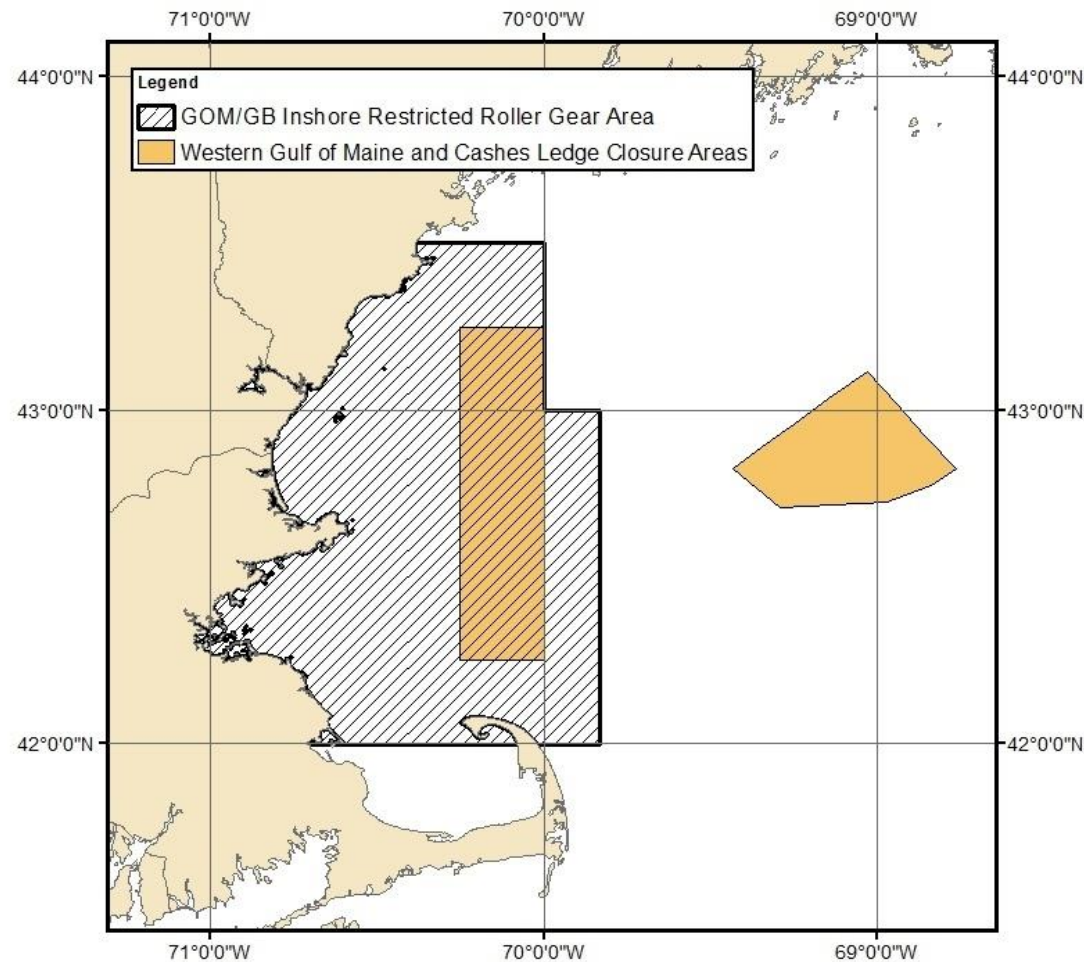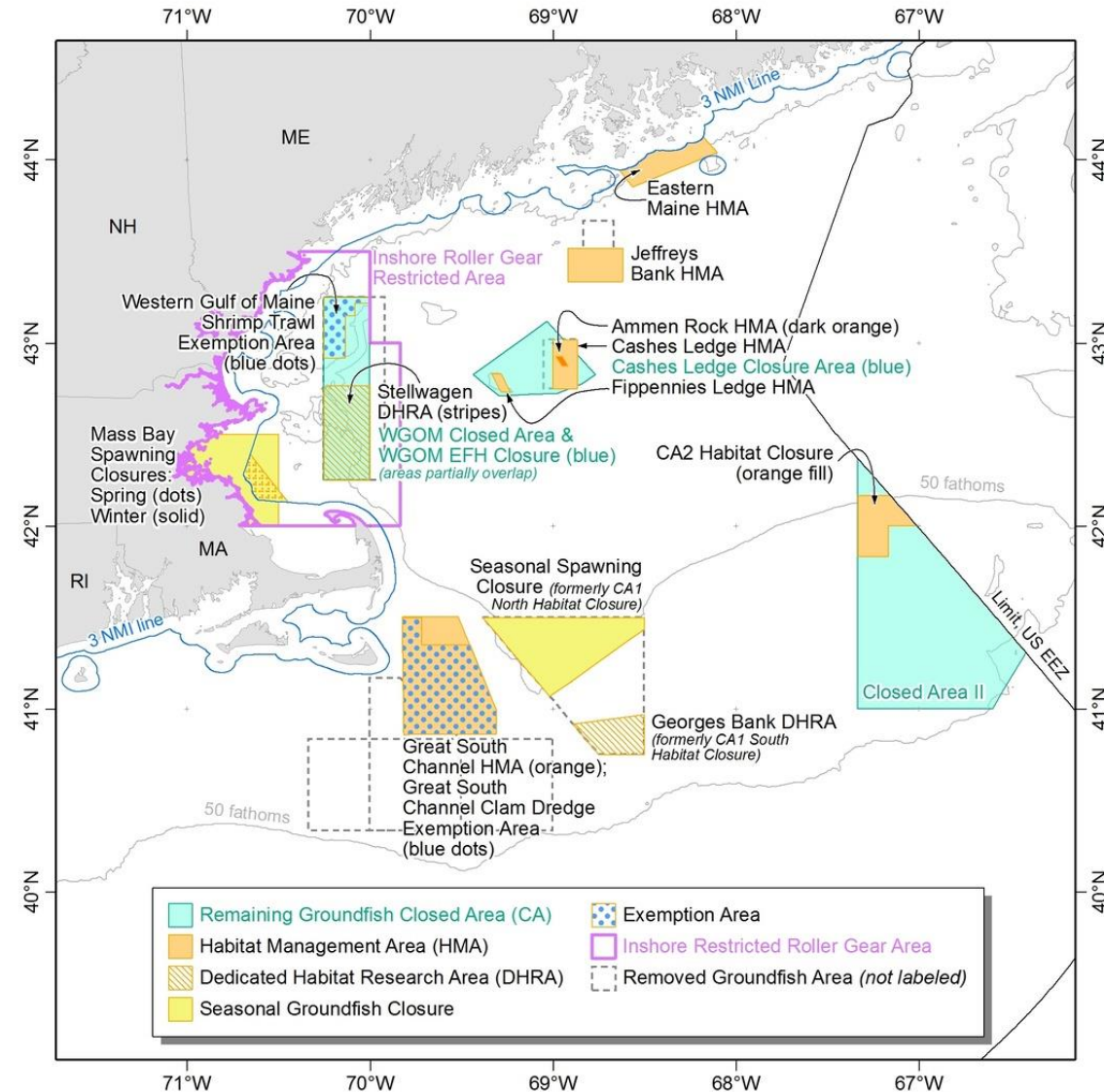
For all trawl vessels fishing in the GOM/GB Inshore Restricted Roller Gear Area, the maximum diameter of any part of the trawl footrope, including discs, rollers or rockhoppers, may not exceed 12 inches.

Habitat/Spawning

Habitat/Spawning