



Mid-Atlantic Fishery Management Council
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MEMORANDUM

Date: June 30, 2021
To: Dr. Chris Moore, Executive Director
From: Matthew Seeley, Staff
Subject: 2022-2023 Bluefish Specifications

Executive Summary

A management track assessment for bluefish was conducted in June 2021. The assessment incorporates data through 2019, including the revised time series (1985-2019) of recreational catch provided by the Marine Recreational Information Program (MRIP).¹

The Council and Board approved the Bluefish Allocation and Rebuilding Amendment at their June 2021 meeting. The rebuilding portion of the Amendment includes a 7-year constant fishing mortality plan that will begin in 2022. For comparison purposes, updated rebuilding projections were developed for the P* and 7-year constant fishing mortality approach. All projections were developed using the new risk policy for 2022 and beyond. Projections will be rerun every two years through the Northeast Fisheries Science Center (NEFSC) assessment process to ensure adequate rebuilding progress is being made. The next assessment is a research track assessment scheduled for 2022, which will inform the 2024-2025 specifications package. This assessment will thoroughly explore discard estimates and other model issues.

In July 2021, the Monitoring Committee (MC) will review recent fishery performance and make a recommendation to the Council and Board regarding 2022-2023 annual catch targets (ACTs), total allowable landings (TALs), commercial quotas, recreational harvest limits (RHLs), and any other associated management measures.

This memo provides two options for review of the 2022-2023 bluefish specifications. Option 1 treats the total catch values (e.g., 2022 = 40.70 million pounds (18,463 mt) and 2023 = 43.36 million pounds (19,667 mt)) from the 7-year constant fishing mortality rebuilding plan as an ABC (Table 1). Option 2 treats the total catch value from the 7-year constant fishing mortality rebuilding

¹ In July 2018, MRIP released revisions to their time series of recreational catch and landings estimates based on adjustments for a revised angler intercept methodology and a new effort estimation methodology (i.e., a transition from a telephone-based effort survey to a mail-based effort survey). The revised, or calibrated, estimates of catch and landings for most years are several times (~3x) higher than the previous estimates for shore and private boat modes, substantially raising the overall bluefish catch and harvest estimates.

plan as an OFL proxy (resulting in an ABC of 25.26 million pounds (11,460 mt) for 2022 and 30.62 million pounds (13,890 mt) for 2023, which allows for a scientific uncertainty buffer through the ABC calculations risk policy spreadsheet (Table 2). Ultimately, staff recommends Option 2, which includes an ABC of 25.26 million pounds (11,460 mt) for 2022 and an ABC of 30.62 million pounds (13,890 mt) for 2023.

Table 1. Option 1 for 2022-2023 bluefish specifications.

Management Measure	Option 1				Basis
	2022		2023		
	mil lb.	mt	mil lb.	mt	
Overfishing Limit (OFL)	40.70	18,463	43.36	19,667	Stock assessment projections
ABC	40.70	18,463	43.36	19,667	Derived by SSC; Follows the rebuilding plan through NEFSC projections
ACL	40.70	18,463	43.36	19,667	Defined in FMP as equal to ABC
Commercial ACL	5.70	2,585	6.07	2,753	ABC x 14%
Commercial Management Uncertainty	0	0	0	0	Derived by the Monitoring Committee
Commercial ACT	5.70	2,585	6.07	2,753	(ACL – Management Uncertainty) x 14%
Recreational ACL	35.01	15,878	37.29	16,914	ABC x 86%
Recreational Management Uncertainty	0	0	0	0	Derived by the Monitoring Committee
Recreational ACT	35.01	15,878	37.29	16,914	(ACL – Management Uncertainty) x 86%
Recreational AMs	3.65	1,656	3.65	1,656	2020 ABC overage
Commercial Discards	0	0	0	0	Value used in assessment
Recreational Discards	4.19	1,901	4.19	1,901	2020 GARFO-estimated (MRIP) discards
Commercial TAL	5.70	2,585	6.07	2,753	Commercial ACT - commercial discards
Recreational TAL	27.16	12,321	29.45	13,356	Recreational ACT - recreational discards
Combined TAL	32.86	14,906	35.52	16,110	Commercial TAL + Recreational TAL
Transfer	0	0	0	0	No transfer while overfished or overfishing
Expected Recreational Landings	13.58	6,160	13.58	6,160	2020 Recreational Landings, but remains TBD in December
Commercial Quota	5.70	2,585	6.07	2,753	Commercial TAL +/- transfer
RHL	27.16	12,321	29.45	13,356	Recreational TAL +/- transfer

Table 2. Option 2 for 2022-2023 bluefish specifications – Staff recommendation.

Management Measure	Option 2				Basis
	2022		2023		
	mil lb.	mt	mil lb.	mt	
Overfishing Limit (OFL)	40.56	18,399	45.17	20,490	Stock assessment projections
ABC	25.26	11,460	30.62	13,890	Derived by SSC; Follows the rebuilding plan through NEFSC projections
ACL	25.26	11,460	30.62	13,890	Defined in FMP as equal to ABC
Commercial ACL	3.54	1,604	4.29	1,945	ABC x 14%
Commercial Management Uncertainty	0	0	0	0	Derived by the Monitoring Committee
Commercial ACT	3.54	1,604	4.29	1,945	(ACL – Management Uncertainty) x 14%
Recreational ACL	21.73	9,856	26.34	11,945	ABC x 86%
Recreational Management Uncertainty	0	0	0	0	Derived by the Monitoring Committee
Recreational ACT	21.73	9,856	26.34	11,945	(ACL – Management Uncertainty) x 86%
Recreational AMs	3.65	1,656	3.65	1,656	2020 ABC overage
Commercial Discards	0	0	0	0	Value used in assessment
Recreational Discards	4.19	1,901	4.19	1,901	2020 GARFO-estimated (MRIP) discards
Commercial TAL	3.54	1,604	4.29	1,945	Commercial ACT - commercial discards
Recreational TAL	13.89	6,298	18.49	8,388	Recreational ACT - recreational discards
Combined TAL	17.42	7,903	22.78	10,333	Commercial TAL + Recreational TAL
Transfer	0	0	0	0	No transfer while overfished or overfishing
Expected Recreational Landings	13.58	6,160	13.58	6,160	2020 Recreational Landings, but remains TBD in December
Commercial Quota	3.54	1,604	4.29	1,945	Commercial TAL +/- transfer
RHL	13.89	6,298	18.49	8,388	Recreational TAL +/- transfer

Introduction

The Magnuson-Stevens Act (MSA) requires each Council's SSC to provide ongoing scientific advice for fishery management decisions, including recommendations for ABC, preventing overfishing, and achieving maximum sustainable yield. The Council's catch limit recommendations for the upcoming fishing year(s) cannot exceed the ABC recommendation of the SSC. In addition, the MC established by the Fishery Management Plan (FMP) is responsible for developing recommendations for management measures designed to achieve the recommended catch limits. The SSC recommends ABCs that addresses scientific uncertainty, while the MC recommends ACTs that address management uncertainty and management measures to constrain catch to the TALs.

This year, the SSC and MC will recommend 2022-2023 ABCs and management measures, respectively, based on the updated management track assessment and ongoing rebuilding plan. The Council/Board will meet jointly to consider these recommendations in August 2021.

Recent Catch and Landings

Recreational harvest, dead discards (GARFO-estimated), and commercial landings from 2000-2020 are presented in Figure 1.

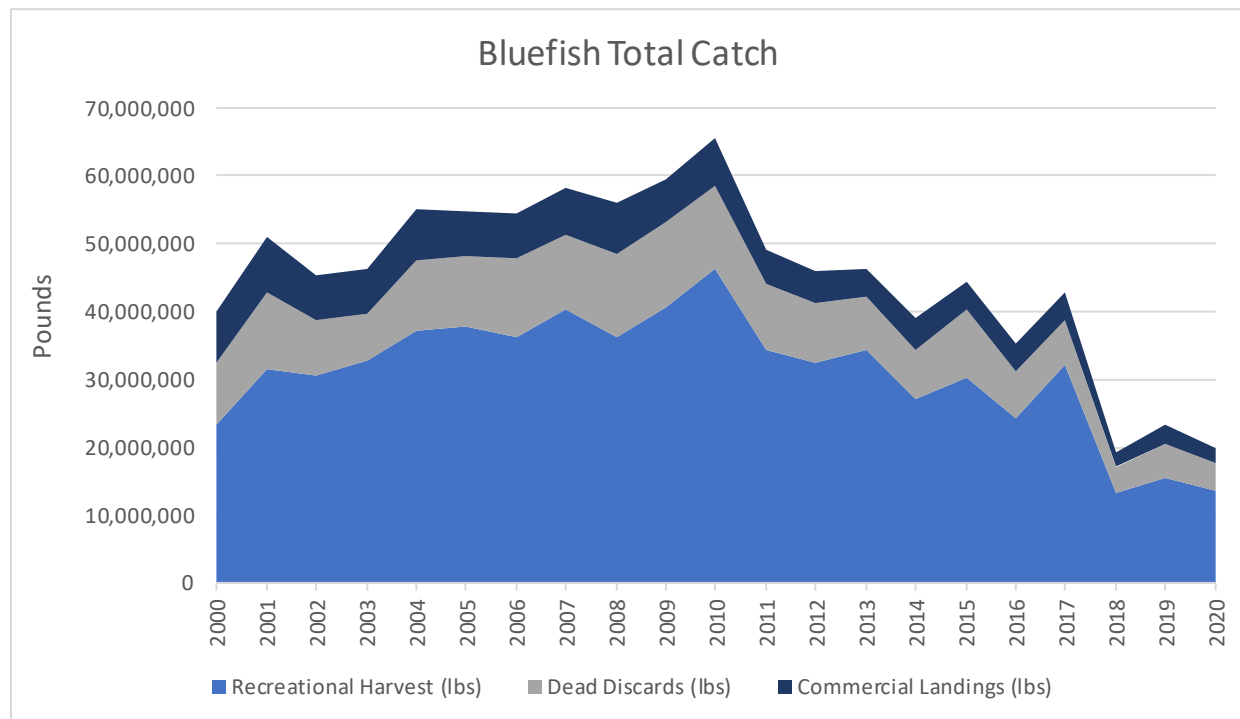


Figure 1. Bluefish total catch (recreational harvest, recreational dead discards and commercial landings) from 2000-2020.

MRIP recreational landings decreased by approximately 13% from 2019 to 2020 (15.56 million pounds to 13.58 million pounds) and reported the second lowest recreational landings (2018-

lowest) for the time series (Table 3). This coincides with effort, as the number of recreational trips² in 2020 (8,745,993) is the third lowest reported in the 2000-2020 period.

Commercial landings decreased by approximately 22% from 2019 to 2020 (2.78 million pounds to 2.16 million pounds), which represents the lowest commercial landings in the time series (Table 2). Landings identified through the dealer database (cf ders) were harvested with the following gear: gillnet (52%), followed by unknown gear (24%), otter trawl/bottom fish (15%), handline (5%) and other (4%).

Table 3. Recreational harvest/catch and commercial landings by state for 2020.

State	Recreational						Commercial
	Harvest			Catch	Released Alive	Dead Discards	Landings
	Pounds	Number	Average Weight ¹ (pounds)	Number	Number	Number	Pounds ³
ME	0	0	0	0	0	-	527
NH	1,800	376	4.8	376	0	-	0
MA	553,242	162,128	3.4	906,269	744,141	111,621	112,674
RI	508,227	220,556	2.3	1,089,449	868,893	130,334	334,745
CT	594,546	298,383	2.0	1,407,730	1,109,347	166,402	22,312
NY	1,478,719	885,517	1.7	3,701,474	2,815,957	422,394	341,623
NJ	1,808,548	595,103	3.0	3,372,216	2,777,113	416,567	152,799
DE	94,901	53,751	1.8	219,288	165,537	24,831	4,303
MD	214,991	173,846	1.2	494,214	320,368	48,055	21,000
VA	305,092	395,751	0.8	1,172,803	777,052	116,558	165,623
NC	2,124,224	2,108,296	1.0	8,666,047	6,557,751	983,663	857,719
SC	154,420	289,339	0.5	2,187,307	1,897,968	284,695	0
GA	9,902	10,795	0.9	187,272	176,477	26,472	0
FL	5,732,605	4,142,380	1.4	7,277,380	3,135,000	470,250	144,698
Total	13,581,217	9,336,221	-	30,681,825	21,345,604	3,201,841	2,158,023

Discard Estimates

There are currently two methods to estimate recreational bluefish discards that result in very different estimates (e.g., 2019 GARFO estimated = 4,880,759 pounds, 2019 NEFSC estimated = 15,414,721 pounds), however there is only one estimate for 2020 (2020 GARFO estimated =

² Estimated number of recreational fishing trips where the primary or secondary target was bluefish, Maine – Florida's East Coast. Source: MRIP.

³ State only commercial landings from North Carolina and Florida are not always present in the cf ders database, and thus may not yet be finalized. Final commercial catch accounting will be made available by GARFO prior to setting specifications.

4,191,779 pounds). The first approach, which is used by GARFO and Council staff (for catch accounting), applies the MRIP estimated mean weight (by year, state and wave) of harvested fish (A+B1) times the number of released fish (MRIP-B2s by year, state and wave) and an assumed 15% release mortality. Previously, the Monitoring Committee generally agreed that this estimate does not fully capture recreational fishery dynamics because this approach uses the mean weight of harvested fish, not discards, and the length frequency data suggests that released fish tend to be larger than retained fish. The second approach, which is used by the NEFSC for catch accounting, incorporates a length-weight relationship for released fish data from the MRIP, American Littoral Society tag releases, and volunteer angler surveys from Connecticut, Rhode Island, and New Jersey. However, this sampling approach does not characterize the entire coast, which adds to the uncertainty in these estimates. Given there is no NEFSC estimate of discards for 2020 (since the assessment only goes through 2019), Council staff used the GARFO estimated discards to generate the specifications. Moreover, the constant F-rebuilding projections used to inform the 2022-2023 ABCs incorporate the 2020 GARFO estimated discards.

Due to the ongoing discussion surrounding bluefish discards and which estimate is more appropriate, the NEFSC assessment scientist indicated that the next research track assessment would thoroughly investigate using the MRIP release weight methodology (used by GARFO and the Council to monitor the fishery) to estimate the weight of released fish in the assessment.

Review of Prior SSC Recommendations

In September 2019, the SSC recommended new ABCs for 2020-2021, which incorporated the results of the 2019 operational stock assessment. To make this recommendation, the SSC reviewed 2018 fishery performance, the 2019 data update, and materials from the SAW 60 benchmark assessment.

To derive the 2020-2021 ABCs, a CV of 100% was applied to the OFL with a typical life history (which was increased from 60% due to the patterns in the revised MRIP estimates). The SSC offered ABCs using the constant/average and varied approach (Table 4). Upon review, the Council selected to move forward with the average ABC approach. This resulted in ABCs of 7,385 mt.

In July 2020, the SSC did not recommend any changes to the ABC of 7,385 mt.

Table 4. 2019 bluefish operational assessment ABC projections for 2020-2021. The projections assume the 2019 ABC of 9,897 mt with recreational catch in ‘New’ MRIP equivalents will be taken in 2019, providing an estimated catch of 22,614 mt in 2019. OFL Total Catches are catches in each year fishing at $F_{MSY} = 0.183$, prior to calculation of the associated annual ABC. The projections sample from the estimated recruitment for 1985-2018 and use the MAFMC SSC OFL CV working group recommended OFL CV = 100%.

Average ABC 2020-2021
 Total Catch, Landings, Discards, Fishing Mortality (F)
 and Spawning Stock Biomass (SSB)
 Catches and SSB in metric tons

Year	OFL Total Catch	ABC Total Catch	ABC F	ABC P* value	ABC SSB
2019	15,373	22,614	0.279	0.679	92,773
2020	14,956	7,385	0.087	0.198	102,166
2021	17,228	7,385	0.075	0.154	115,041

Stock Status and Biological Reference Points

Projections

In June 2021, a bluefish management track assessment, which included revised bluefish MRIP estimates and commercial landings through 2019 indicated the bluefish stock is still overfished and overfishing is not occurring. This update builds upon the 2019 operational assessment with data through 2018 that first indicated the stock was overfished and overfishing was not occurring.

At the June 2021 Council meeting, the Council and Board approved a 7-year constant fishing mortality rebuilding plan as part of the Bluefish Allocation and Rebuilding Amendment. Throughout their discussion, support was also provided for the p* rebuilding approach, and thus, both projections are available for comparison (Table 5 – top and bottom).

The biological reference points for bluefish revised through the 2021 management track assessment include an updated fishing mortality threshold of $F_{MSY} = F_{35\%}$ (as the F_{MSY} proxy) = 0.181, and a biomass reference point of $SSB_{MSY} = SSB_{35\%}$ (as the SSB_{MSY} proxy) = 444.74 million lbs (201,729 mt). The minimum stock size threshold ($1/2 SSB_{MSY}$) is estimated to be 222.37 million lbs (100,865 mt); Table 5. SSB in 2019 was 211.07 million lbs (95,742 mt) (Figure 2 and Table 6).

Management track assessment results indicated that the bluefish stock was overfished and overfishing was not occurring in 2019 relative to the biological reference points. Fishing mortality on the fully selected age 2 fish was estimated to be 0.172 in 2019, 95% of the updated fishing mortality threshold reference point F_{MSY} proxy = $F_{35\%} = 0.181$ (Figure 3). There is a 90% probability that the fishing mortality rate in 2019 was between 0.140 and 0.230.

Table 5. 2021 Bluefish Operational Assessment ABC Projection for 2022-2026 and a 7 year rebuilding projection (2022-2028) with constant fishing mortality. The rebuilding target (SSBMSY) from the 2021 assessment is 201,729 mt. The projections use an estimated 2020 catch and the 2021 ABC of 7,385 mt. The 2020 total catch estimate uses dealer (cfders) data for commercial landings, MRIP harvest (A+B1) data for recreational landings, and GARFO estimated dead discards (MRIPB2 by Wave and State * Discard Mortality * Average weight). Note: Discard Mortality = 0.15 and Average Weight = (Total weight harvested (A+B1) / Total harvest in numbers (A+B1)). OFL Total Catches are catches in each year fishing at Frebuild = 0.154, prior to calculation of the associated annual ABC. The projections sample from the distribution of estimated recruitment for 1985-2019 and use the MAFMC SSC OFL CV working group recommended OFL CV = 100%.

Frebuild Iterative Projection 2022-2026

Total Catch, Fishing Mortality (F)

Pstar and Spawning Stock Biomass (SSB)

Catches and SSB in metric tons

Year	OFL Total Catch	ABC Total Catch	ABC F	ABC P* value	ABC SSB
2020	14,727	9,041	0.093	0.230	112,864
2021	15,352	7,385	0.068	0.285	135,071
2022	18,399	11,460	0.094	0.320	149,387
2023	20,490	13,890	0.102	0.362	166,096
2024	22,773	16,960	0.113	0.391	177,910
2025	24,043	19,094	0.121	0.427	192,273
2026	25,787	22,103	0.131	0.451	204,244

7 year Frebuild projection

Total Catch, Fishing Mortality (F)

Spawning Stock Biomass (SSB)

Catches and SSB in metric tons

Year	Total Catch	F	SSB
2020	9,041	0.093	112,892
2021	7,385	0.068	135,081
2022	18,463	0.154	146,103
2023	19,667	0.154	155,671
2024	21,113	0.154	161,005
2025	21,782	0.154	169,690
2026	23,081	0.154	178,163
2027	24,570	0.154	192,196
2028	25,646	0.154	202,299

Table 6. Summary of changes in biological reference points and terminal year SSB and F estimates resulting from SAW/SARC 60 process to the 2019 operational assessment and 2021 management track assessment.

	SAW/SARC 60 (2015) Biological Reference Points and most recent update stock status results (data through 2014)	Bluefish Operational Assessment (2019) Biological Reference Points and stock status results (data through 2018)	Bluefish Management Track Assessment (2021) Biological Reference Points and stock status results (data through 2019)
Stock Status	Not Overfished, Not Overfishing	Overfished, Not Overfishing	Overfished, Not Overfishing
SSB_{MSY}	223.42 million lbs (101,343 mt)	438.10 million lbs (198,717 mt)	444.74 million lbs (201,729 mt)
½ SSB_{MSY}	111.71 million lbs (50,672 mt)	219.05 million lbs (99,359 mt)	222.37 million lbs (100,865 mt)
Terminal year SSB	2014: 258.76 million lbs (86,534 mt) 85% of SSB _{MSY}	2018: 200.71 million lbs (91,041 mt) 46% of SSB _{MSY}	2019: 211.07 million lbs (95,742 mt) 47.5% of SSB _{MSY}
F_{MSY}	0.190	0.183	0.181
Terminal year F	2014: 0.157 83% of F _{MSY}	2018: 0.146 80% of F _{MSY}	2019: 0.172 95% of F _{MSY}

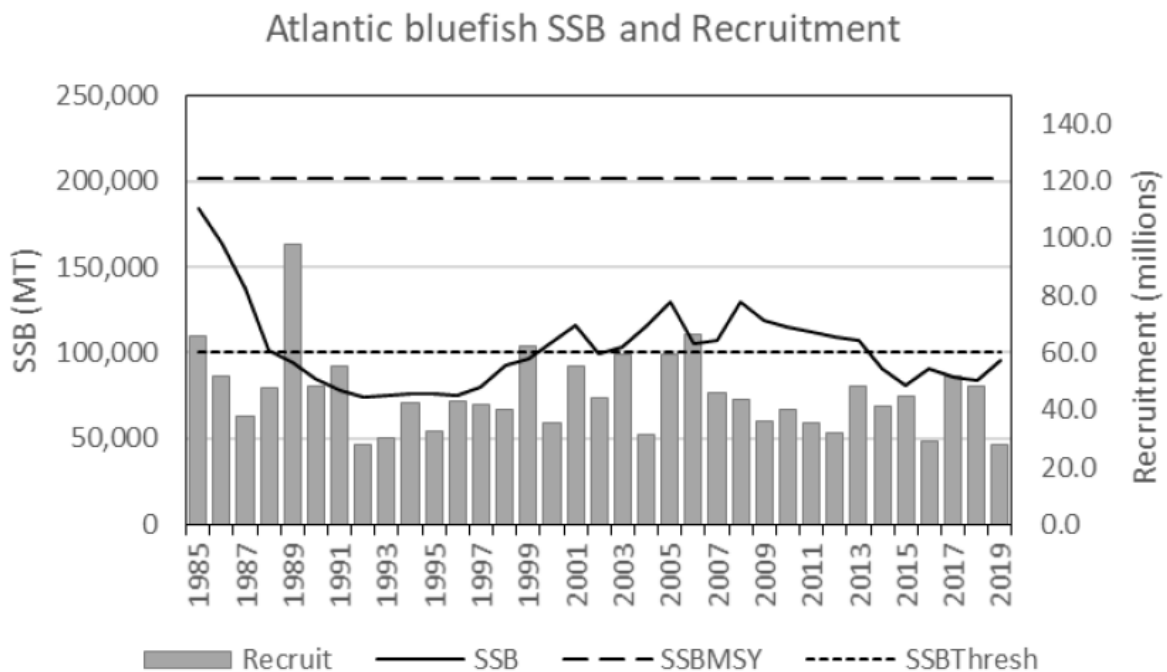


Figure 2. Atlantic bluefish spawning stock biomass (SSB; solid black line) and recruitment at age 0 (R; gray vertical bars) by calendar year. The horizontal dashed line is the updated SSB_{MSY} proxy = SSB_{35%} = 201,729 MT, and the dotted black line is the SSB_{Threshold} = 100,865 MT.

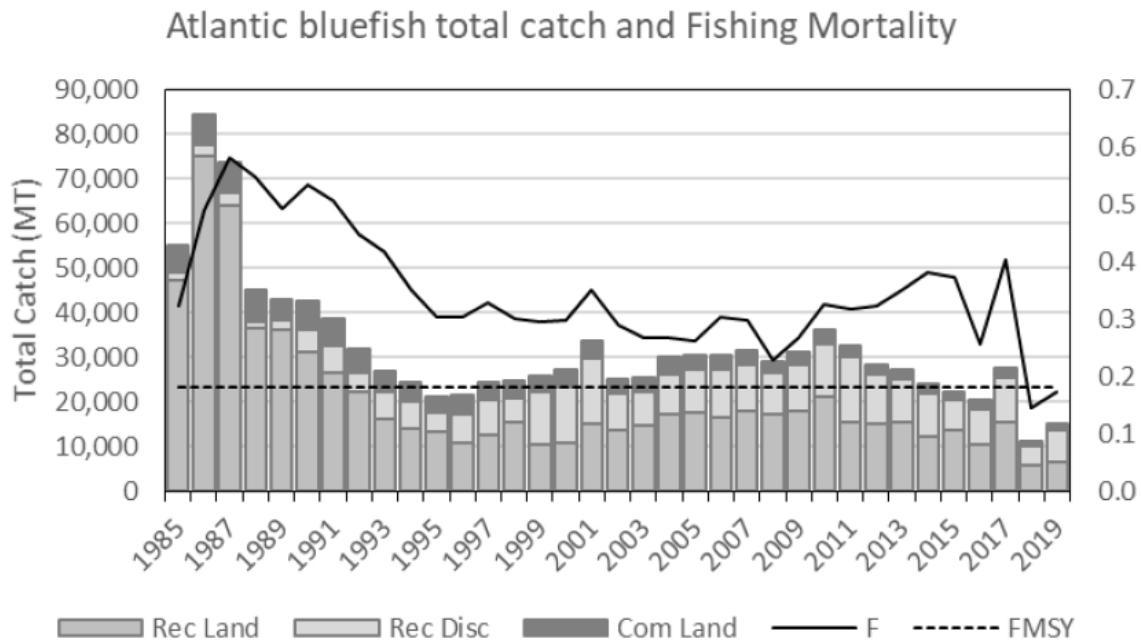


Figure 3. Total fishery catch (metric tons; MT; solid line) and fishing mortality (F, peak at age 3; squares) for Atlantic bluefish. The horizontal dashed line is the updated F_{MSY} proxy = $F_{35\%}$ = 0.181.

The 2021 management track assessment indicated the bluefish stock has experienced a decline in SSB over the past decade, coinciding with an increasing trend in F. Recruitment has remained fairly steady, fluctuating just below the time-series mean of 46 million fish. Both commercial and recreational fisheries have had lower catches in recent years. These lower catches are possibly a result of availability. Anecdotal evidence suggests larger bluefish stayed offshore and inaccessible to most of the recreational fishery during the past few years.

Staff Recommendations for 2022-2023 ABCs

Two ABC options are available for SSC consideration so they can make an informed decision given the many uncertainties and moving parts present in the bluefish fishery and assessment.

Option 1 treats the total catch value (2022 = 40.70 million pounds (18,463 mt) and 2023 = 43.36 million pounds (19,667 mt)) from the 7-year constant fishing mortality rebuilding plan as an ABC. Option 2 treats the total catch value from the 7-year constant fishing mortality rebuilding plan as an OFL proxy (resulting in an ABC of 25.26 million pounds (11,460 mt) for 2022 and 30.62 million pounds (13,890 mt) for 2023), which allows for a scientific uncertainty buffer through the ABC calculations risk policy spreadsheet. Ultimately, staff recommends Option 2, which includes an ABC of 25.26 million pounds (11,460 mt) for 2022 and an ABC of 30.62 million pounds (13,890 mt) for 2023.

The Council and ASMFC's Bluefish Board approved a 7-year constant fishing mortality rebuilding plan with higher associated catches than the P* Council risk policy rebuilding plan. The preferred rebuilding plan projects total catch at 40.56 million pounds for 2022. This projected total catch is not an ABC or OFL, but instead the resulting total catch when fishing at the highest possible F to rebuild in 7 years. Typically, the assessment scientist projects at F_{MSY} , which is a target that cannot be exceeded because it is associated with an OFL. By using the 7-year constant F rebuilding plan, the Council has chosen a new "OFL proxy". This new level of F cannot be exceeded since the goal is to rebuild in 7 years. Therefore, the SSC may want to consider applying the risk policy to this new OFL proxy since there is a new F target, which is no longer F_{MSY} . Ultimately, by being more conservative and fishing below the targeted F, rebuilding may occur more quickly. Fishing above the targeted F will likely result in total catch that does not achieve a rebuilt status within 7 years.

In addition to the ongoing rebuilding plan, there are many uncertainties associated with the bluefish fishery. There are still two estimates of discards (NEFSC and GARFO MRIP-estimated) used to inform fishery performance and the projections. The 2019 discard estimates from the NEFSC exceed the GARFO MRIP-estimated discards by over 11 million pounds (and there are no 2020 estimates of discards from the NEFSC). Since there are no 2020 NEFSC discard estimates, the F rebuild projections use the 2020 realized catch that incorporates the GARFO MRIP-estimated total catch (including the commercial dealer landings). Moreover, the 2020 realized catch exceeds the 2020 ACL by 3.65 million pounds, which triggers accountability measures on the recreational ACT for 2022.

The last major source of uncertainty is tied to the 2020 recreational harvest estimates. Following the overfished designation in 2019, the Council implemented 2020 management measures for bluefish that resulted in a 3 and 5-fish bag limit for private and for-hire anglers, respectively. This reduction in bag limit was anticipated to result in a ~28% reduction in recreational harvest to ensure the RHL was not exceeded. However, many states were not able to implement the new measures until at least midway through 2020. Then, the COVID-19 pandemic further influenced the uncertainty tied to the 2020 estimates, but MRIP offered data imputations to help inform 2020 harvest. The data imputations by MRIP used 2018 and 2019 to estimate 2020 harvest. These 2020 imputed estimates unfortunately did not include the impacts of the revised management measures that reflect the reduction in bag limits. Therefore, the bluefish fishery still has not realized the true impacts of the reduced bag limits.

In 2022, a research track assessment will be conducted where discards and other data and model issues will be thoroughly explored. This assessment may change the overall model used to assess bluefish, and in turn update all biological reference points and the resulting rebuilding plan. This assessment will ultimately inform the 2024-2025 specifications package. Therefore, the SSC should consider the uncertainties associated with raising the ABC from 16.28 million pounds to 40.70 million pounds the year a rebuilding plan starts (while overfished and almost overfishing – 2019 F is 95% F_{MSY}) and the year prior to a research track assessment.

For all the reasons outlined above, staff recommends the SSC consider Option 1 and Option 2 for setting ABCs for the 2022-2023 bluefish specifications package.