



Mid-Atlantic Fishery Management Council
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Michael P. Luisi, Chairman | G. Warren Elliott, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: September 26, 2019
To: Council and Board
From: Matthew Seeley, staff
Subject: 2020-2021 Bluefish Specifications

The Council and Board will consider 2020-2021 specifications for bluefish on Tuesday, October 8, 2019. Materials listed below are provided for the Council and Board's consideration of this agenda item.

Please note that some materials are behind other tabs. Items are listed in reverse chronological order.

- 1) Monitoring Committee recommendation summary
- 2) September 2019 Scientific and Statistical Committee meeting report (*behind Tab 18*)
- 3) Staff memo on 2020-2021 bluefish specifications and management measures dated September 11, 2019
- 4) Staff memo on 2020-2021 bluefish specifications dated August 20, 2019
- 5) Bluefish 2019 operational stock assessment (*behind Tab 7*)
- 6) 2019 Advisory Panel Fishery Performance Report
- 7) 2019 Bluefish Fishery Information Document
- 8) ASMFC 2019 Bluefish FMP Review



**Bluefish Monitoring Committee
Meeting Summary
September 18, 2018**

Attendees: Matthew Seeley (Council Staff), Dustin Colson Leaning (ASMFC), Cynthia Ferrio (GARFO), Mike Celestino (NJ-F&W), Richard Wong (DE-F&W), Eric Durrell (MD-DNR), Nicole Lengyel (RI-DMF), Jim Gartland (VIMS), Tony Wood (NEFSC), and John Maniscalco (NY DEC).

Others in attendance: José Montañez (Council Staff), Hannah Hart (FL), Julia Livermore (RI DEM), Mark Terceiro (NEFSC), Nichola Meserve (MA), Rachel Sysak, and Harold Nugent.

Introduction

The Bluefish Monitoring Committee (MC) received a presentation including a summary of the Scientific and Statistical Committee's (SSC's) acceptable biological catch (ABC) recommendation for 2020-2021, recent fishery performance, and the 2019 bluefish operational assessment. The SSC recommended ABCs using an average and annual¹ approach were 7,385 mt (16.28 M lbs) (average approach) for 2020-2021 and 6,603 mt and 8,167 mt (14.56 M lbs and 18.01 M lbs) (annual approach) for 2020 and 2021, respectively. The ABC recommendation reflects the results of the 2019 bluefish operational assessment, which designated the bluefish stock as overfished and overfishing not occurring. Following the presentation, the MC discussed the average vs. annual ABC approaches, various sources of management uncertainty, estimates of discards (recreational and commercial), 2020-2021 expected recreational landings, transfers from the recreational to commercial fishery, and research recommendations.

Average vs. Annual ABC Approach

The MC recommended the Council select the average ABC approach for the 2020-2021 fishing years. The MC noted that SSB is projected to be above the SSB threshold ($\frac{1}{2}$ BMSY = 99,359 MT) in 2020 and 2021 under either ABC approach. Under the average ABC approach, the probability of overfishing decreases from 2020-2021 while increasing SSB by approximately 10,000 mt per year. The average ABC approach offers consistency for a fishery that is predominantly dictated by MRIP estimates. Many bluefish advisors also continue to comment that stability in quotas is necessary to provide flexibility in fishing operations. Furthermore, the consistent ABCs offer stability in a fishery that is currently overfished and scheduled for a research track (benchmark) assessment in 2022.

¹ The annual approach uses the annual 2020 and 2021 ABCs derived by SSC Council P* policy, whereas the average approach uses the average of the 2020 and 2021 ABCs.

Management Uncertainty

Considering the bluefish flowchart (Figure 1) in the Fishery Management Plan, management uncertainty is accounted for prior to the sector specific annual catch target (ACT) split, which means management uncertainty will affect both the resulting recreational harvest limit (RHL) and commercial quota (CQ), even if management uncertainty exists in only one of the two sectors. The MC discussed various sources of management uncertainty in considering an adjustment from the annual catch limit (ACL) to the fishery-specific annual catch target (ACT). Most comments were related to the recreational sector and centered on estimation methods related to recreational dead releases (see below). Thus, discussion developed related to the ability of the MC to set sector specific management uncertainties. However, the MC does not currently have discretion to apply a direct management uncertainty adjustment to one sector but not the other (see Figure 1). The MC recommended Council consider amending the process by which management uncertainty is incorporated into the specification process, allowing for sector-specific adjustments.

Discards and post release mortality were discussed as the major sources of management uncertainty. The MC decided that discards are explicitly accounted for within the bluefish flowchart, so they should not be further included in the discussion of management uncertainty. Additionally, MC members suggested that post release mortality may be higher than the assumed 15%. However, the recommended discard approach (see below) imposes a large enough decrease in the RHL that the MC recommended imposing no reduction for the associated management uncertainties.

Discards

The MC discussed two approaches used to characterize discards in the recreational fishery. First, the MC was presented with the same approach Council staff used last year, which uses the MRIP estimated mean weight (by wave) of harvested fish (A+B1) times the number of released fish (MRIP-B2s) and assumed 15% mortality. The MC generally agreed that this estimate does not fully capture what is occurring in the recreational fishery because length frequency data suggests that most anglers keep smaller bluefish and release larger bluefish. The second approach uses the Northeast Fisheries Science Center (NEFSC) discard estimates, which 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. Furthermore, NEFSC staff suggested that the uncertainty in these estimates has grown in recent years as availability of bluefish has apparently decreased. In previous years 1,000+ fish were collected, but only 522 were collected in 2018. Moreover, outliers tend to shift the average discard weight.

Despite some MC members supporting the MRIP mean weight approach, the MC ultimately recommended using recreational discard values from the NEFSC to characterize recreational discards in the next specification cycle because they include the length-weight relationship and data from volunteer angler surveys. The MC believes this approach more accurately reflects how the fishery operates. Committee members also recommended working to improve consistency in

discard calculations and estimates produced by the NEFSC, Council, and Greater Atlantic Regional Fisheries Office (GARFO)².

The MC discussed recent reports of increased commercial discards in the bluefish fishery. Commercial discards were not included in the benchmark stock assessment or operational assessment for a number of reasons (SAW 60). Some MC members indicated that in recent years (i.e., since 2015) localized discards in the commercial fishery are increasing and may not be insignificant. This should be pursued further prior to the 2022 research track assessment.

2020-2021 Expected Recreational Landings

In recent years, expected recreational landings have been calculated from three-year averages using the most recent complete fishing years. This year, the MC recommended that 2020-2021 expected recreational landings be estimated using the three-year average (23.15 M lbs). This recommendation was made because the MC was hesitant to use only the terminal year estimate (13.27 M lbs) since the 2018 fishing year represents the lowest recorded recreational bluefish landings. Furthermore, the MC indicated that bluefish landings have fluctuated in recent years and that a three-year average helps to mitigate the effects of high variability in the terminal year (2018).

Transfers

The MC recommended no transfer be applied from the recreational fishery to commercial fishery. No transfer can occur (as indicated in the regulations) because the recreational fishery is anticipated to harvest the full RHL.

Resulting Commercial Quota and RHL

The resulting RHL and CQ recommended by the MC for the 2020-2021 specifications cycle are 3.62 M lbs and 2.77 M lbs, respectively (Table 1). The decisions made by the MC to recommend NEFSC-based recreational discard estimates and the 3-year average for expected recreational landings when setting bluefish specifications results in very low CQs (-64%) and RHLs (-69%) for 2020-2021. Defining recreational landings and discards in this manner likely accounts for a large amount of the uncertainty present in the management of the bluefish stock, which faces rebuilding over the next few years. The Monitoring Committee acknowledges that such low levels of allowable landings present challenges to managers and fishery participants.

Research Recommendations

The MC recommends that future research focuses on improving the understanding of discards within the recreational and commercial fisheries. Overall, there needs to be a coherent system in place for monitoring discards to account for regional differences in discard length/weight. To bolster this recommendation, MC members suggested looking into including southern states in

² GARFO calculates recreational bluefish discards using the MRIP mean weight (by wave) of harvested fish (A+B1), which coincides with how the Council calculated discards in the last specifications cycle.

the recreational releases data collection program. Additionally, as a lower priority, MC members are interested in better understanding the migration patterns of mature bluefish through, for example, tagging efforts.

Recreational Management Measures

To constrain harvest to the RHL, the MC will likely have to impose one or more management measures. However, the MC needs Council action on the RHLs and CQs prior to identifying the associated management measures. Thus, the MC will reconvene in November 2019 to utilize the Council approved RHLs and CQs to set management measures (similar to summer flounder/scup/black sea bass).

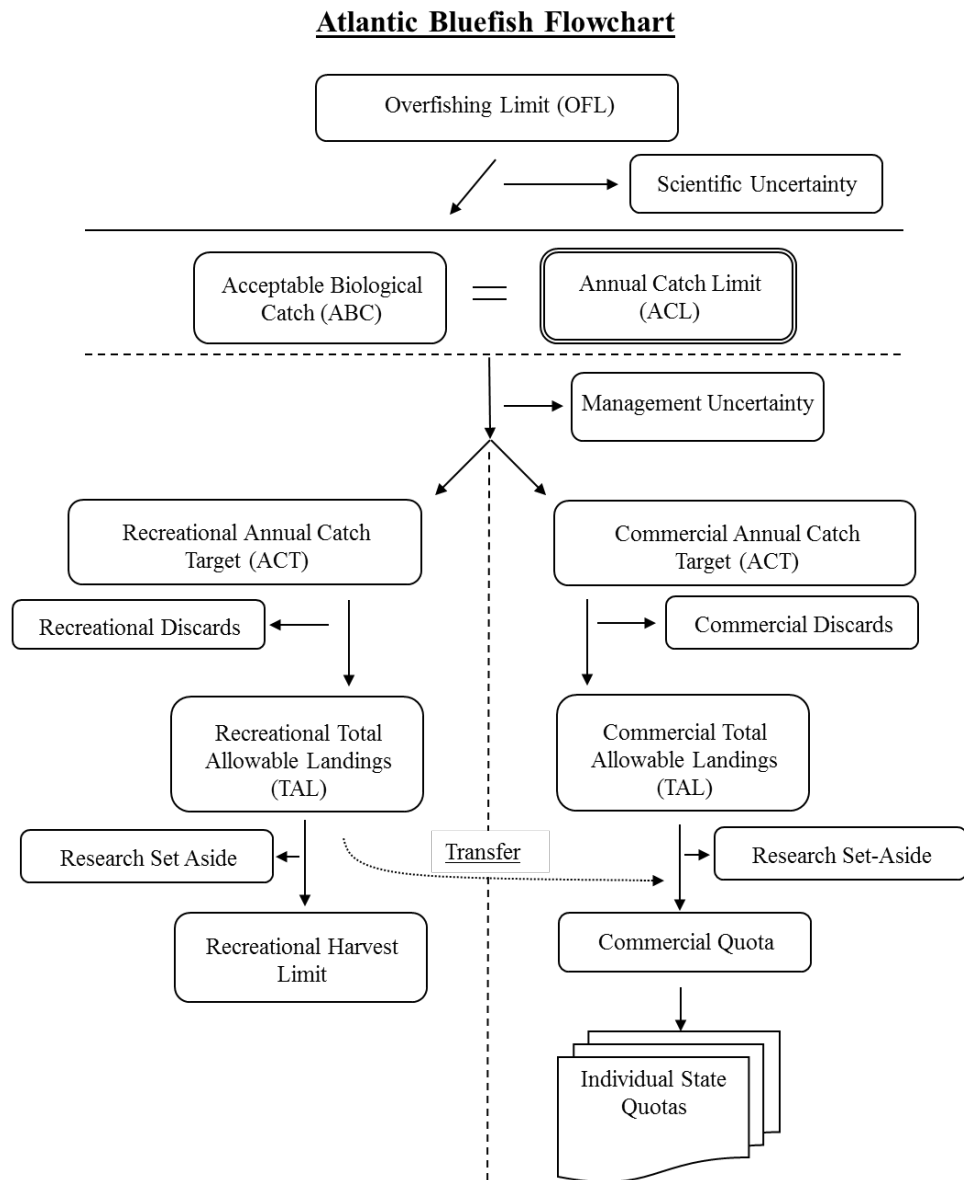


Figure 1. Bluefish specification process as described in Amendment 3 to the Bluefish FMP.

Table 1. Current (2019) management measures and MC recommended bluefish catch and landings limits for 2020-2021.

Management Measure	2019		Basis	2020-2021 (Average)		Basis
	M lb ³	mt		M lb ³	mt	
ABC	21.81	9,895	Derived by SSC; Council P* policy	16.28	7,385	Derived by SSC; Council P* policy
ACL	21.81	9,895	Defined in FMP as equal to ABC	16.28	7,385	Defined in FMP as equal to ABC
Management Uncertainty	0	0	Derived by Monitoring Committee	0	0	Derived by Monitoring Committee
Commercial ACT	3.71	1,682	(ACL – Management Uncertainty) x 17%	2.77	1,255	(ACL – Management Uncertainty) x 17%
Recreational ACT	18.11	8,213	(ACL – Management Uncertainty) x 83%	13.51	6,130	(ACL – Management Uncertainty) x 83%
Commercial Discards	0	0	Value used in assessment	0	0	Value used in the assessment
Recreational Discards	2.49	1,129	2017 discards	9.90	4,489	2018 NEFSC estimated discards – value used in the assessment
Commercial TAL	3.71	1,682	Commercial ACT – commercial discards	2.77	1,255	Commercial ACT – commercial discards
Recreational TAL	15.62	7,083	Recreational ACT – recreational discards	3.62	1,641	Recreational ACT – recreational discards
TAL Combined	19.32	8,766	Commercial TAL + recreational TAL	6.39	2,896	Commercial TAL + recreational TAL
Expected Rec Landings	9.52	4,318	2017 Recreational landings	23.15	10,500	Average recreational landings (2016-2018)
Transfer	4.00	1,814	Proposed by the Council via a motion	0	0	Calculated so the expected recreational landings equal the RHL
Commercial quota	7.71	3,497	Commercial TAL + transfer	2.77	1,255	Commercial TAL + transfer
RHL	11.62	5,271	Recreational TAL – transfer	3.62	1,641	Recreational TAL - transfer

³ SSC recommendations are made in metric tons (mt) and thus, the management measures are developed using mt. When values are converted to millions of pounds (M lb) the numbers may slightly shift due to rounding. The conversion factor used is 1 mt = 2204.6226 pounds.



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MEMORANDUM

Date: September 11, 2019
To: Dr. Chris Moore, Executive Director
From: Matthew Seeley, Staff
Subject: 2020-2021 Bluefish Specifications and Management Measures

Summary

This memo supplements the “SSC Staff Memo: 2020-2021 Bluefish Specifications” to include updated staff recommended management measures to the Monitoring Committee (MC) post Scientific and Statistical Committee (SSC) meeting.

An assessment update for bluefish was peer reviewed in early August 2019. The assessment incorporates data through 2018, including the recently revised (calibrated) time series (1985-2018) of recreational catch provided by the Marine Recreational Information Program (MRIP).

At the September 18, 2019 MC meeting, committee members will review data from the 2019 operational assessment, recent fishery performance, the SSC acceptable biological catch (ABC) recommendations. Then, the MC will make recommendations to the Council and Board regarding 2020-2021, annual catch targets (ACTs), total allowable landings (TALs), commercial quotas, and recreational harvest limits (RHLs).

This memo provides updated recommendations for setting bluefish specifications for two years (2020-2021) based on the SSC ABC recommendations of 16.28 million pounds (7,385 mt).

Introduction

At the September 9, 2019 SSC meeting, the committee recommended a bluefish ABC of 16.28 million pounds (7,385 mt) for 2020-2021. This recommendation developed through deliberation on the appropriate overfishing limit (OFL) CV group. In the 2015 benchmark stock assessment, an OFL CV of 60% was applied to develop ABCs. Due to uncertainty with the MRIP estimates, discard estimates, the lack of Bigelow survey data in the southern range, and trends in recruitment, the SSC recommended the 100% OFL CV bin (Table 1).

Table 1. 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%.

Annual 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	6,603	0.078	0.163	102,553
2021	17,355	8,167	0.083	0.183	115,598

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

Staff Recommendations for 2020-2021 Sector-Specific Catch and Landings Limits

As defined by the Omnibus ACLs and AMs Amendment (Amendment 3 to the Bluefish FMP), the ABC includes both landings and discards, and is equal to the ACLs for bluefish. Based on the allocation percentages in the FMP, 83% of the ACT is allocated to the recreational fishery, and 17% to the commercial fishery.

For 2020 and 2021, staff recommends adopting the management measures associated with the average ABC approach using MRIP discards, as a result of the SSC recommending the 100% OFL CV bin (Table 2).

Table 2. 2020-2021 bluefish staff recommended specifications for the average and annual approach. Note: for the Annual ABCs, ## correlates to the value for 2020/2021, respectively.

Management Measure	Basis for 2020-2021 Staff Recommendation	2020 - 2021 Average ABC MRIP Discards		2020 - 2021 Average ABC NEFSC Discards		2020 / 2021 Annual ABC MRIP Discards		2020 / 2021 Annual ABC NEFSC Discards	
		M lbs	mt	M lbs	mt	M lbs	mt	M lbs	mt
		ABC	Derived by SSC; Council P* policy	16.28	7,385	16.28	7,385	14.56/ 18.01	6,603/ 8,167
ACL	Defined in FMP as equal to ABC	16.28	7,385	16.28	7,385	14.56/ 18.01	6,603/ 8,167	14.56/ 18.01	6,603/ 8,167
Management Uncertainty	Derived by MC	0	0	0	0	0	0	0	0
Commercial ACT	(ACL – Mgmt. Uncertainty) x 17%	2.77	1,255	2.77	1,255	2.47/ 3.06	1,123/ 1,388	2.47/ 3.06	1,123/ 1,388
Recreational ACT	(ACL – Mgmt. Uncertainty) x 83%	13.51	6,130	13.51	6,130	12.08/ 14.94	5,480/ 6,779	12.08/ 14.94	5,480/ 6,779
Commercial Discards	Value used in assessment	0	0	0	0	0	0	0	0
Recreational Discards	2018 Discards	4.03	1,829	9.90	4,489	4.03	1,829	9.90	4,489
Commercial TAL (pre-transfer)	Comm ACT – Comm Discards	2.77	1,255	2.77	1,255	2.47/ 3.06	1,123/ 1,388	2.47/ 3.06	1,123/ 1,388
Recreational TAL (pre-transfer)	Rec ACT – Rec Discards	9.48	4,301	3.62	1,641	8.05/ 10.91	3,651/ 4,950	2.19/ 5.05	991/ 2,290
TAL Combined	Comm TAL + Rec TAL	12.25	5,556	6.39	2,896	10.52/ 13.97	4,774/ 6,338	4.66/ 8.11	2,114/ 3,678
Transfer	Expected Rec Landings	0	0	0	0	0	0	0	0
Expected Rec Landings	2018 Rec Landings	13.27	6,020	13.27	6,020	13.27	6,020	13.27	6,020
Commercial Quota	Comm TAL + Transfer	2.77	1,255	2.77	1,255	2.47/ 3.06	1,123/ 1,388	2.47/ 3.06	1,123/ 1,388
Recreational Harvest Limit	Rec TAL - Transfer	9.48	4,301	3.62	1,641	8.05/ 10.91	3,651/ 4,950	2.19/ 5.05	991/ 2,290

Average ABC Approach

The average ABC approach offers consistency for a fishery that is predominantly dictated by MRIP estimates. Additionally, the probability of overfishing decreases from 2020-2021 while increasing SSB by approximately 10,000 mt per year. Furthermore, consistent ABCs offer stability in a fishery that is currently overfished and scheduled for a research track (benchmark) assessment in 2022.

Discards

Currently, there are two approaches used to calculate recreational discards. The discard estimates provided in the peer reviewed 2019 operational assessment use the MRIP data and incorporate a length-weight relationship for released fish from numerous sources. The discard estimates provided in the peer review of the new MRIP calibration are calculated by estimating the mean weight per bluefish and multiplying by the released fish (B2s) and then applying a 15% mortality rate. The resulting 2018 discard estimates are 9.90 M lbs (Assessment) and 4.03 M lbs (MRIP-mean), respectively.

Last year, the MC stated; “The MC suggested using recreational discard values from the NEFSC to characterize recreational discards in the next specifications cycle.”

The bluefish regulations state; “the Bluefish Monitoring Committee shall recommend measures to ensure the ACL will not be exceeded”. To align with how the Greater Atlantic Regional Fisheries Office monitors ACLs and avoids ACL overages, staff recommends using the MRIP mean weight estimated discards for the 2020/2021 fishing years.

Recreational Harvest Limit and Management Measures

The recreational landings in 2018 were 13,270,862 lbs. Pending MC and Council decision, the RHL may range from 3.62-9.48 M lbs using the average ABC approach and 2.19-10.91 M lbs using the annual ABC approach.

Using the average ABC approach and MRIP discards results in an RHL for 2020-2021 of 9.48 M lbs, which equates to a ~29% decrease from the expected recreational landings. Using the average ABC approach and NEFSC discards results in an RHL for 2020-2021 of 3.62 M lbs, which equates to a ~73% decrease from the expected recreational landings. Using the annual ABC approach and MRIP discards results in an RHL for 2020 of 8.05 M lbs, which equates to a ~40% decrease from the expected recreational landings. Using the annual ABC approach and NEFSC discards results in an RHL for 2020 of 2.19 M lbs, which equates to a ~84% decrease from the expected recreational landings.

Due to the variability in bluefish landings in recent years and the large range of potential bluefish RHLs to be selected by the MC, Council, and board, staff recommends a reduction in the amount of fishing days over the course of the season. To estimate the necessary reduction in season to ensure the RHL is not exceeded, staff used a three-year average (2016-2018) by state and wave to present bluefish harvest (Table 3). Furthermore, average bluefish percent reduction in coastwide harvest (lbs) associated with closing one day per wave from 2016-2018 is presented in Table 4.

Considering the staff recommended average ABC approach using the MRIP discards, recreational harvest would need to be constrained to 9.48 M lbs. This ~29% decrease from the expected recreational landings can be accounted for by closing waves 5 and 6 or waves 1 and 2, coastwide. Thus, the MC will need to account for the effects closing certain waves or fishing days will have on some states versus others (north vs. south).

Table 3. Annual average percent of bluefish harvest (lbs) by state and wave from 2016-2018 based on revised MRIP estimates.

Row Labels	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6	Total
2016	0.87%	11.84%	38.12%	15.01%	28.72%	5.44%	100.00%
MAINE	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%
NEW HAMPSHIRE	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
MASSACHUSETTS	0.00%	0.00%	17.97%	39.79%	42.24%	0.00%	100.00%
RHODE ISLAND	0.00%	0.00%	25.01%	34.08%	33.39%	7.52%	100.00%
CONNECTICUT	0.00%	0.00%	5.06%	48.20%	37.68%	9.06%	100.00%
NEW YORK	0.00%	4.87%	48.73%	22.48%	19.70%	4.21%	100.00%
NEW JERSEY	0.00%	9.13%	46.17%	3.41%	33.23%	8.06%	100.00%
DELAWARE	0.00%	0.00%	77.94%	5.97%	16.09%	0.00%	100.00%
MARYLAND	0.00%	0.00%	5.07%	44.78%	49.58%	0.57%	100.00%
VIRGINIA	0.00%	17.67%	41.41%	19.69%	21.11%	0.12%	100.00%
NORTH CAROLINA	0.01%	13.22%	30.31%	24.95%	29.28%	2.23%	100.00%
SOUTH CAROLINA	0.00%	17.14%	10.83%	1.82%	58.12%	12.09%	100.00%
GEORGIA	0.00%	16.89%	34.33%	2.46%	46.32%	0.00%	100.00%
FLORIDA	7.36%	42.45%	27.93%	1.49%	16.01%	4.77%	100.00%
2017	0.29%	43.33%	25.84%	10.45%	12.19%	7.91%	100.00%
MAINE	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	100.00%
MASSACHUSETTS	0.00%	0.00%	25.67%	41.24%	33.09%	0.00%	100.00%
RHODE ISLAND	0.00%	0.00%	27.12%	15.25%	57.60%	0.03%	100.00%
CONNECTICUT	0.00%	0.00%	5.23%	52.22%	42.55%	0.00%	100.00%
NEW YORK	0.00%	0.01%	26.71%	23.77%	24.37%	25.14%	100.00%
NEW JERSEY	0.00%	25.98%	59.14%	4.90%	8.87%	1.12%	100.00%
DELAWARE	0.00%	50.52%	46.97%	0.29%	2.22%	0.00%	100.00%
MARYLAND	0.00%	1.54%	6.67%	58.40%	31.74%	1.65%	100.00%
VIRGINIA	0.00%	26.73%	2.70%	2.63%	7.03%	60.91%	100.00%
NORTH CAROLINA	1.05%	49.05%	28.28%	3.45%	12.99%	5.18%	100.00%
SOUTH CAROLINA	0.00%	49.85%	13.15%	5.94%	17.45%	13.60%	100.00%
GEORGIA	0.00%	0.00%	91.59%	4.99%	2.80%	0.62%	100.00%
FLORIDA	0.57%	92.88%	0.30%	1.69%	0.06%	4.50%	100.00%
2018	15.84%	11.84%	21.88%	12.42%	26.87%	11.15%	100.00%
MASSACHUSETTS	0.00%	0.00%	13.89%	53.26%	32.85%	0.00%	100.00%
RHODE ISLAND	0.00%	0.00%	8.35%	14.70%	76.95%	0.00%	100.00%
CONNECTICUT	0.00%	0.00%	3.05%	51.73%	45.22%	0.00%	100.00%
NEW YORK	0.00%	0.00%	55.65%	16.88%	26.30%	1.17%	100.00%
NEW JERSEY	0.00%	0.00%	46.42%	13.10%	40.32%	0.15%	100.00%
DELAWARE	0.00%	0.00%	80.38%	7.07%	11.80%	0.75%	100.00%
MARYLAND	0.00%	0.00%	0.70%	44.08%	55.20%	0.02%	100.00%
VIRGINIA	0.00%	0.58%	3.74%	28.93%	43.37%	23.38%	100.00%
NORTH CAROLINA	0.00%	13.32%	21.84%	8.65%	43.34%	12.85%	100.00%
SOUTH CAROLINA	0.00%	4.22%	36.47%	1.20%	56.38%	1.72%	100.00%
GEORGIA	0.00%	13.66%	36.52%	0.32%	4.06%	45.43%	100.00%
FLORIDA	46.45%	26.37%	1.45%	1.50%	1.70%	22.52%	100.00%
Coastwide	3.46%	26.36%	29.35%	12.41%	20.74%	7.67%	100.00%

Table 4. Average bluefish percent reduction in coastwide harvest (lbs) associated with closing one day per wave from 2016-2018 based on revised MRIP estimates.

Sum of Harvest (A+B1) Total Weight (lb)						
Row Labels	Wave 1	Wave 2	Wave 3	Wave 4	Wave 5	Wave 6
MAINE	0.00%	0.00%	1.15%	0.48%	0.00%	0.00%
NEW HAMPSHIRE	0.00%	0.00%	0.00%	1.61%	0.00%	0.00%
MASSACHUSETTS	0.00%	0.00%	0.34%	0.70%	0.59%	0.00%
RHODE ISLAND	0.00%	0.00%	0.37%	0.35%	0.87%	0.04%
CONNECTICUT	0.00%	0.00%	0.08%	0.81%	0.66%	0.07%
NEW YORK	0.00%	0.03%	0.64%	0.36%	0.37%	0.23%
NEW JERSEY	0.00%	0.24%	0.84%	0.08%	0.40%	0.07%
DELAWARE	0.00%	0.55%	0.95%	0.04%	0.10%	0.00%
MARYLAND	0.00%	0.01%	0.06%	0.78%	0.77%	0.01%
VIRGINIA	0.00%	0.27%	0.31%	0.27%	0.36%	0.43%
NORTH CAROLINA	0.01%	0.44%	0.45%	0.20%	0.44%	0.10%
SOUTH CAROLINA	0.00%	0.39%	0.30%	0.05%	0.74%	0.16%
GEORGIA	0.00%	0.21%	0.65%	0.01%	0.11%	0.66%
FLORIDA	0.23%	1.10%	0.09%	0.03%	0.05%	0.15%
Coastwide	0.06%	0.43%	0.48%	0.20%	0.34%	0.13%



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Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: August 20, 2019
To: Dr. Chris Moore, Executive Director
From: Matthew Seeley, Staff
Subject: 2020-2021 Bluefish Specifications

Executive Summary

An assessment update for bluefish was peer reviewed in early August 2019. The assessment incorporates data through 2018, including the recently revised (calibrated) time series (1985-2018) of recreational catch provided by the Marine Recreational Information Program (MRIP).¹

Interim 2020 catch and landings limits for bluefish (Table 1) were adopted by the Council and Board in March 2019, intended to serve as a placeholder until the 2019 operational assessment is peer reviewed and used to develop management measures. The interim measures currently implemented for 2020 include an Acceptable Biological Catch (ABC) of 21.81 million lbs or 9,895 mt. Now that the assessment update is complete, the Scientific and Statistical Committee (SSC) should recommend 2020-2021 ABCs, for the Council and Atlantic States Marine Fisheries Commission's (Commission) Bluefish Board (Board) to consider at their joint October 2019 meeting.

Similarly, the Monitoring Committee (MC) should review recent fishery performance and make a recommendation to the Council and Board regarding 2020-2021, Annual Catch Targets (ACTs), Total Allowable Landings (TALs), commercial quotas, and recreational harvest limits (RHLs).

This memo provides recommendations for setting bluefish specifications for two years (2020-2021). For 2020 and 2021, staff recommends an Acceptable Biological Catch (ABC) of 20.92 million pounds (9,489 mt).

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 higher than the previous estimates for shore and private boat modes, substantially raising the overall bluefish catch and harvest estimates.

Table 1. Interim 2020 specifications for bluefish (in millions of pounds and metric tons) drafted as status quo from 2019.

Management Measure	2020 (Interim)		Basis
	mil lb. ²	mt	
Overfishing Limit (OFL)	27.97	12,688	Stock assessment projections
ABC	21.81	9,895	Derived by SSC, based on Council risk policy (2019)
ACL	21.81	9,895	Defined in FMP as equal to ABC
Commercial ACT	1,682	3.71	(ACL – Management Uncertainty) x 17%
Recreational ACT	8,213	18.11	(ACL – Management Uncertainty) x 83%
Commercial Discards	0	0	Value used in assessment
Recreational Discards	1,129	2.49	2017 discards
Commercial TAL	1,682	3.71	Commercial ACT – commercial discards
Recreational TAL	7,083	15.62	Recreational ACT – recreational discards
Expected Recreational Landings	4,318	9.52	2017 Recreational landings
Transfer	1,814	4.00	Proposed by the Council via a motion
Commercial Quota	3,497	7.71	Commercial TAL + transfer
RHL	5,271	11.62	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.

In early 2019, the Council/Board adopted recommendations for interim 2020 catch and landings limits for bluefish, with the expectation that these limits would be revisited in early 2020 based on the results of the new assessment update.

Both the SSC and MC will review these 2020 measures and recommend measures for 2020-2021. The Council and the Commission's Bluefish Board will meet jointly to consider these recommendations in October 2020.

² Interim specifications are based on BASE “old” MRIP estimates.

The SSC should consider recommending either constant 2-year ABCs (using the standard risk policy application) or average ABCs from 2020-2021 based on recent adjustments to the Council's risk policy that allow for multi-year ABC averaging.

On April 11, 2018, the final rule published implementing the Omnibus ABC Framework Adjustment (Framework 3 to the Bluefish FMP; 83 FR 15511). This framework adjustment allows the SSC to specify constant multi-year ABCs if the average of the probabilities of overfishing meet the Council's risk policy goals and if the resulting ABC always results in less than a 50% probability of overfishing in any one year. Additional considerations and recommendations for ABC averaging are described in the "Staff ABC Recommendations" section of this memo.

Recent Catch and Landings

Commercial and recreational (revised MRIP data) landings and dead discards 1994-2018 are shown in Figure 1.

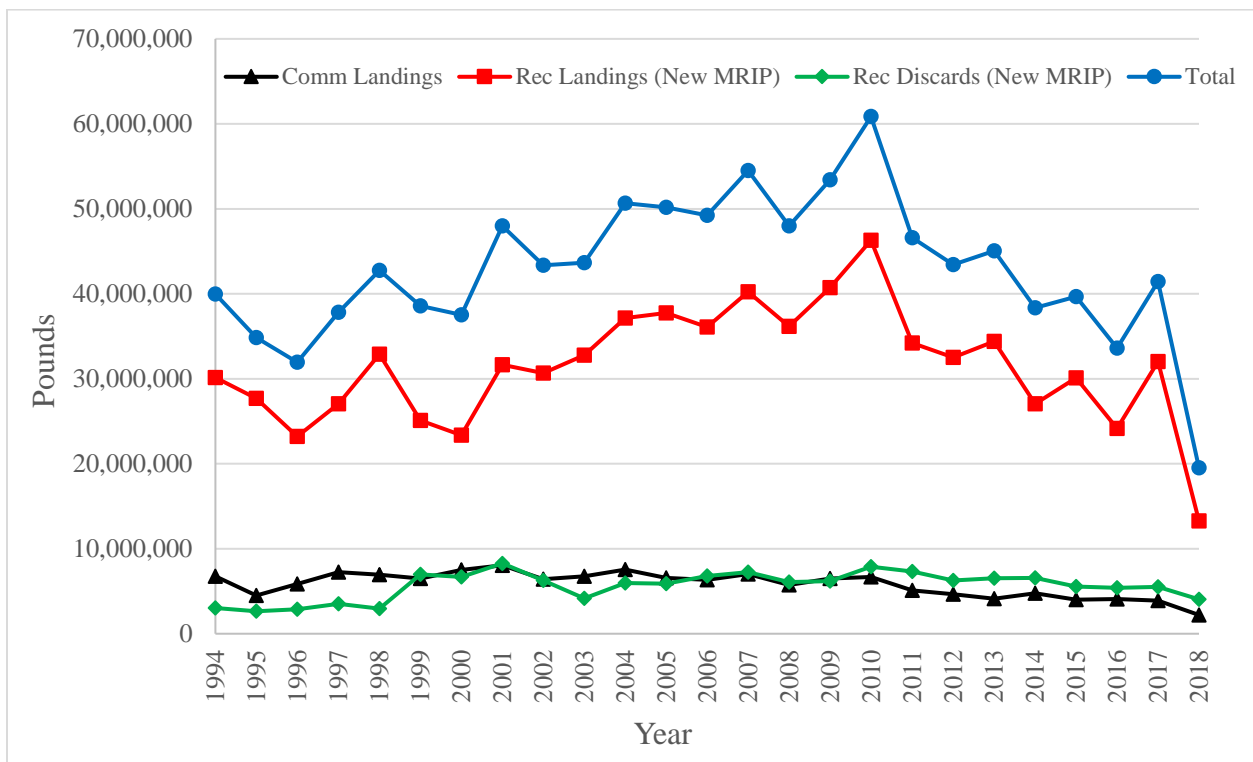


Figure 1. Bluefish catch components 1994-2018 including the revised MRIP time series for recreational data.

New MRIP recreational landings decreased by approximately 59% from 2017 to 2018 (32.02 million pounds to 13.27 million pounds) and reported the lowest recreational landings for the time series in 2018. This coincides with effort, as the number of recreational trips in 2018 (5,749,291) is the lowest reported in the time series.

Commercial landings decreased by approximately 40% from 2017 to 2018 (3.64 million pounds to 2.20 million pounds). This decrease led to the lowest recorded landings in the commercial time series. Landings were broken down with the following gear: gillnet (50%), followed by unknown gear (26%), otter trawl/bottom fish (9%), other (9%) and handline (6%). Commercial (and recreational) landings by state are available in Table 2.

Table 2. 2018 recreational (New and Old MRIP estimates) and commercial landings by state.

State	“New” Recreational Landings	“Old” Recreational Landings	Commercial Landings
ME	0	0	29
NH	0	0	0
MA	611,557	328,240	195,402
RI	210,033	119,961	237,182
CT	340,666	238,815	48,220
NY	1,399,517	425,036	539,345
NJ	2,007,110	613,605	56,210
DE	315,105	238,815	6,486
MD	493,192	152,459	27,353
VA	264,534	70,549	102,630
NC	2,630,685	767,364	765,764
SC	403,141	93,814	0
GA	70,284	10,551	0
FL	4,525,038	741,516	224,999
Total	13,270,862	3,639,697	2,203,620

Review of Prior SSC Recommendations

In July 2018, the SSC recommended to carry forward its 2018 ABC recommendation for 2019, as the SSC was not provided any new stock projections and recent catches remained consistent with previous projections. To make this recommendation, the SSC reviewed 2017 fishery performance, the 2017 data update, and materials from the SAW 60 benchmark assessment. Additionally, in February 2019, the SSC recommended status quo specifications for the interim 2020 measures until the results of the 2019 operational assessment.

To derive the 2018 ABC, a CV of 60% was applied to the OFL to reflect the much-improved treatment of uncertainty in the current bluefish assessment. Three-year specifications were required (at the time). The OFL level for 2016 was determined by using $F_{35\%}=0.19$. The equilibrium catch (a proxy for MSY) under this scenario is 31.84 million lbs (14,443 mt). The SSB_{msy} is therefore 223.42 million lbs (101,343 mt) and $SSB_{2014} = 190.78$ million lbs (86,534 mt), so the $SSB/SSB_{msy}=0.85$, with an SSB threshold of 111.71 million lbs (50,672 mt). The SSC applied the Council policy of $P^* = 0.307$ in 2016. This resulted in ABCs of:

2016: 8,825 mt ($P^* = 0.307$)
2017: 9,363 mt ($P^* = 0.328$)
2018: 9,895 mt ($P^* = 0.327$)

The 2019 ABC recommendation was status quo from 2018.

2019: 9,895 mt ($P^* = 0.327$)

The SSC considered the following to be the most significant sources of uncertainty associated with the determination of the OFL and ABC (July 2018 SSC Report):

- The SSC-recommended ABC is based on rolling over a projection from 2016 for 2018 for an additional year.
- Uncertainty in the stock recruitment relationship adds to uncertainty in appropriate reference points.
- The uncertainty in MRIP sampling overall, which is the most influential data in the assessment. Questions have been raised about the uncertainty in the historical MRFSS/MRIP estimates in general and are particularly relevant here given the highly episodic nature of Bluefish catches in the recreational fisheries coast wide.
- Approximately 60% of the population biomass is in the aggregated 6+ age group for which there is relatively little information.
- Commercial discards are assumed to be insignificant, which may not be the case.

Stock Status and Biological Reference Points

Projections

In August 2019, a bluefish operational assessment, which included revised bluefish MRIP estimates through 2018 changed the stock status and biological reference points from SAW 60, which utilized data through 2014. All information from this operational assessment were and should be interpreted as preliminary results until publication of the final report.

The biological reference points for bluefish revised through the 2019 operational assessment include a fishing mortality threshold of $F_{MSY} = F_{35\%}$ (as the F_{MSY} proxy) = 0.183, and a biomass reference point of $SSB_{MSY} = SSB_{35\%}$ (as the SSB_{MSY} proxy) = 438.10 million lbs (198,717 mt). The minimum stock size threshold ($1/2 SSB_{MSY}$), is estimated to be 219.05 million lbs (99,359 mt); Table 3. SSB in 2018 was 200.71 million lbs (91,041 mt) (Figure 2).

Operational assessment results indicated that the bluefish stock was overfished and overfishing was not occurring in 2018 relative to the biological reference points. Fishing mortality on the fully selected age 2 fish was 0.146 in 2018, 80% of the updated fishing mortality threshold reference point F_{MSY} proxy = $F_{35\%} = 0.183$ (Figure 3). There is a 90% probability that the fishing mortality rate in 2018 was between 0.119 and 0.205.

Table 3. Summary of changes in biological reference points and terminal year SSB and F estimates resulting from the SAW/SARC 60 process.

	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)
Stock Status	Not Overfished, Not Overfishing	Overfished, Not Overfishing
SSB_{MSY}	223.42 million lbs (101,343 mt)	438.10 million lbs (198,717 mt)
½ SSB_{MSY}	111.71 million lbs (50,672 mt)	219.05 million lbs (99,359 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}
F_{MSY}	0.190	0.183
Terminal year F	2014: 0.157 83% of F _{MSY}	2018: 0.146 80% of F _{MSY}

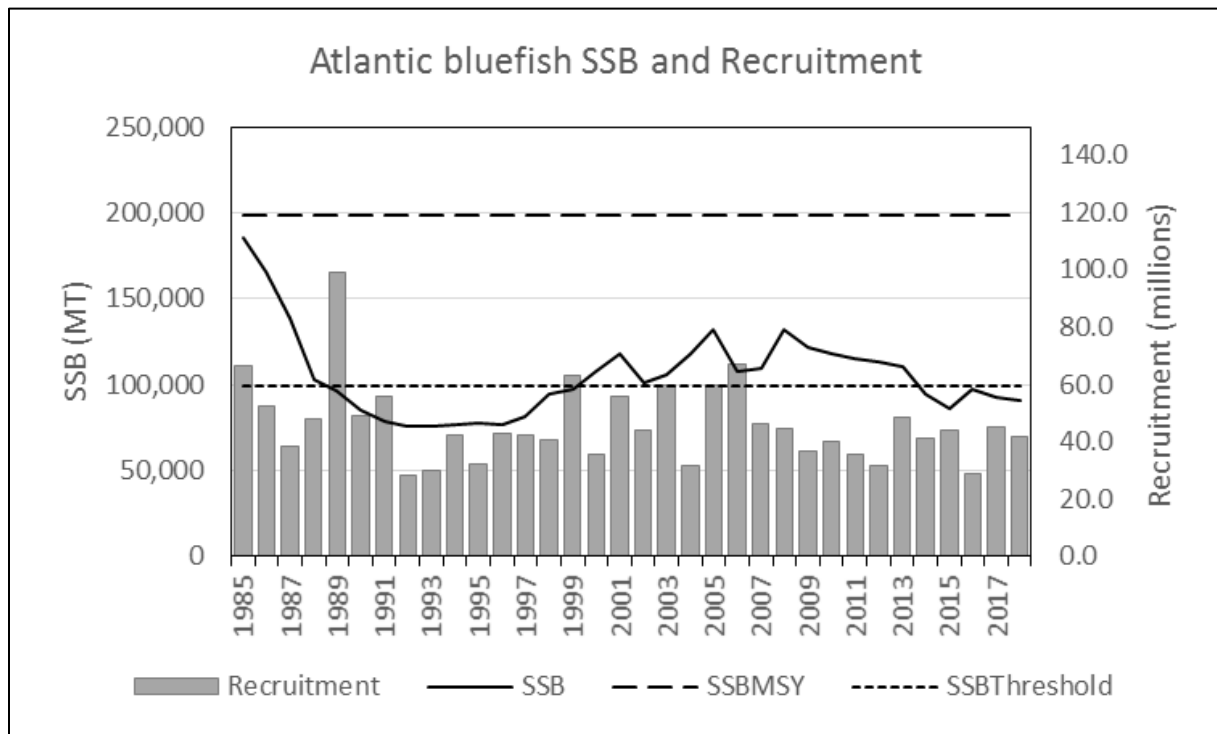


Figure 2. Atlantic bluefish spawning stock biomass (SSB; solid black line) and recruitment at age 0 (R; gray vertical bars) by calendar year. The horizontal dashed line is the updated SSB_{MSY} proxy = SSB_{40%} = 198,717 mt, and the dotted black line is the SSB_{Threshold} = 99,359 mt.

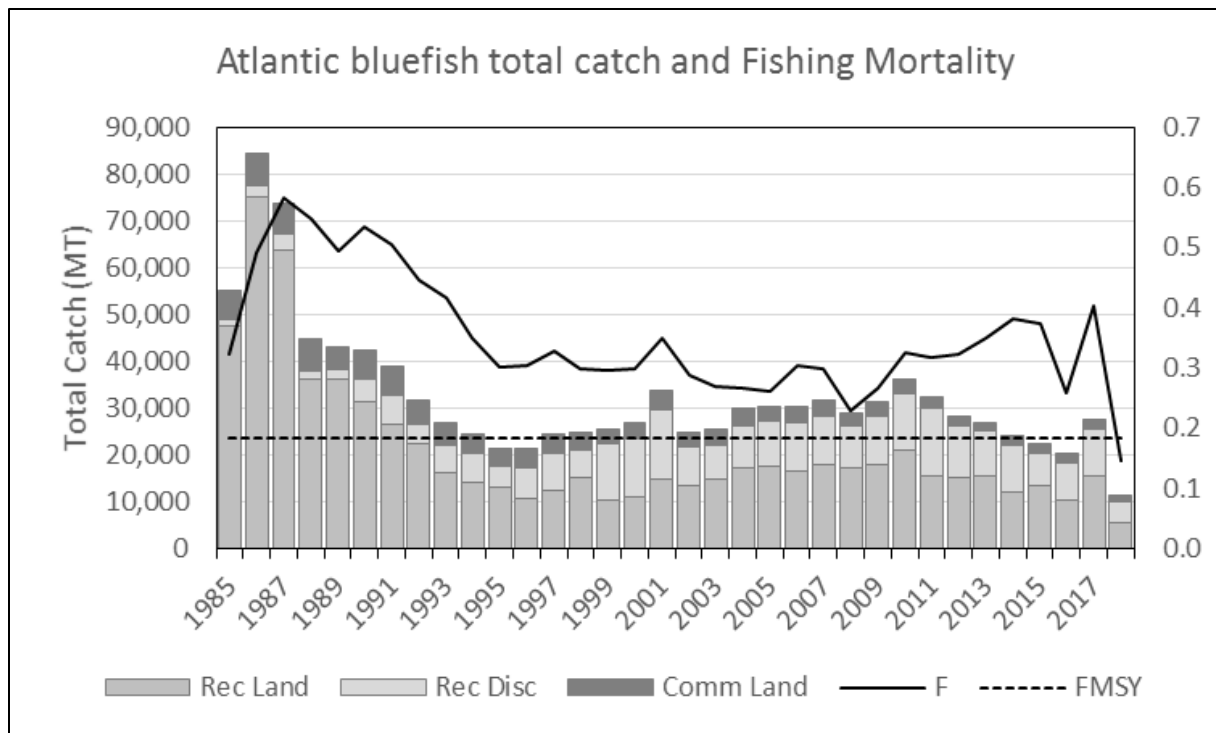


Figure 3. Total fishery catch (metric tons; mt; solid line) and fishing mortality (F, peak at age 3; squares) for Atlantic bluefish. The horizontal dashed line is the updated F_{MSY} proxy = $F_{35\%} = 0.183$.

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 had poor catch in 2016 (44.91 million lbs or 20,370 mt), and 2018 (24.89 million lbs or 11,288 mt), resulting in the second lowest and lowest catches on record, respectively. As a result of the very low catch in 2018, fishing mortality was estimated below the reference point for the first time in the time-series. 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 these two years (Wood 2019).

Staff Recommendations for 2020-2021 ABCs

For 2020 and 2021, staff recommends adopting the average (Table 4B) ABC of 20.92 million pounds (9,489 mt) based on the projections developed from the 2019 bluefish operational assessment (Table 4). Biologically, the variable vs. averaged approaches are similar, resulting in comparable P* values and projected stock biomass at the end of the two years. Staff recommends the average approach because it offers consistency for a fishery that is predominantly dictated by MRIP estimates. Additionally, the probability of overfishing decreases from 2020-2021 while increasing SSB by approximately 10,000 mt per year. Furthermore, consistent ABCs offer stability in a fishery that is currently overfished and scheduled for a research track (benchmark) assessment in 2022.

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 FMSY = 0.183, prior to calculation of the associated annual ABC. The projections sample from the estimated recruitment for 1985-2018 and use the MAFMC standard risk policy with OFL CV = 60%.

A					
Not Staff Recommended - Annual 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	0.757	92,773
2020	14,956	8,676	0.103	0.163	101,527
2021	17,019	10,301	0.108	0.183	112,187

B					
Staff Recommended - 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	0.757	92,773
2020	14,956	9,489	0.113	0.206	101,124
2021	16,889	9,489	0.100	0.149	111,617

2020-2021 Sector-Specific Catch and Landings Limits

As defined by the Omnibus ACLs and AMs Amendment (Amendment 3 to the Bluefish FMP), the ABC includes both landings and discards, and is equal to the ACLs for bluefish (Figure 4). Based on the allocation percentages in the FMP, 83% of the ACT is allocated to the recreational fishery, and 17% to the commercial fishery.

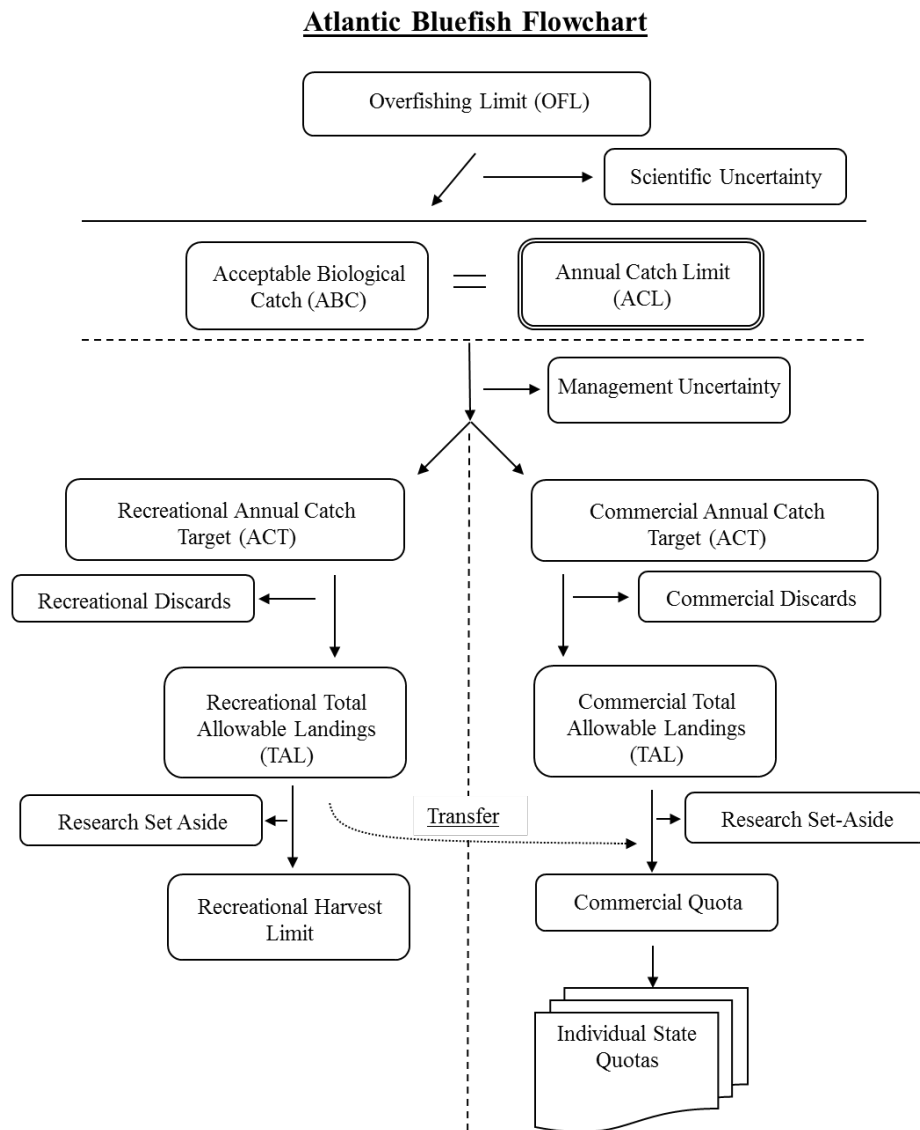


Figure 4. Bluefish specification process as described in Amendment 3 to the Bluefish FMP.

The MC is responsible for recommending ACTs TALs, which are intended to account for management uncertainty and estimated discards, for the Council and Board’s consideration, as well as any other associated management measures. The MC is responsible for considering all relevant sources of management uncertainty in the bluefish fishery and providing the technical basis, including any formulaic control rules, for any reduction in catch when recommending an ACT and TAL.

Management uncertainty is comprised of two parts: uncertainty in the ability of managers to control catch and uncertainty in quantifying the true catch (i.e., estimation errors). Management uncertainty can occur because of a lack of sufficient information about the catch (e.g., due to late reporting, underreporting, and/or misreporting of landings or bycatch) or because of a lack of management precision (i.e., the ability to constrain catch to desired levels). Table 5 includes the staff recommended ACTs/TALs and associated management measures identified using the 2020-2021 ABC projections of 20.92 million lbs (9,489 mt).

Table 5. Current fishing year specifications (2019) and 2020-2021 staff recommended specifications for bluefish.

Management Measure	2019 (Current Measures set in 2018)		Basis for 2020-2021 Staff Recommendation	2020-2021 (Staff recommended)	
	M lbs	mt		M lbs	mt
ABC	21.81	9,895	Derived by SSC; Council P* policy	20.92	9,489
ACL	21.81	9,895	Defined in FMP as equal to ABC	20.92	9,489
Management Uncertainty	0	0	Derived by MC	0	0
Commercial ACT	3.71	1,682	(ACL – Mgmt. Uncertainty) x 17%	3.56	1,613
Recreational ACT	18.11	8,213	(ACL – Mgmt. Uncertainty) x 83%	17.36	7,876
Commercial Discards	0	0	Value used in assessment	0	0
Recreational Discards	2.99	1,356	2018 Discards – MRIP estimated	4.03	1,829
Commercial TAL (pre-transfer)	3.71	1,682	Comm ACT – Comm Discards	3.56	1,613
Recreational TAL (pre-transfer)	15.12	6,857	Rec ACT – Rec Discards	13.33	6,047
TAL Combined	18.83	8,539	Comm TAL + Rec TAL	16.89	7,660
Transfer	4.00	1,814	Make RHL equal Expected Rec Landings (unless already exceeded)	0	0
Expected Rec Landings	11.58	5,253	2018 Rec Landings	13.27	6,020
Commercial quota	7.24	3,286	Comm TAL + Transfer	3.56	1,613
Recreational harvest limit	11.58	5,253	Rec TAL - Transfer	13.33	6,047

References

Atlantic States Marine Fisheries Commission (ASMFC).1989. Fishery Management Plan for Bluefish. 81 pp. + append.

Mid-Atlantic Fishery Management Council. 1990. Fishery management plan for the bluefish fishery. Dover, DE. 81 p. + append.

Mid-Atlantic Fishery Management Council. 2011. Amendment 3 to the fishery management plan for the bluefish fishery. Dover, DE.

Mid-Atlantic Fishery Management Council. 1990. Framework 3 to the fishery management plan for the bluefish fishery. Dover, DE.

Northeast Fisheries Science Center (NEFSC). 2015. 60th Northeast Regional Stock Assessment Workshop (60th SAW) Assessment Report. US Dept Commerce, Northeast Fish Sci Cent Ref Doc. 15-08; 870 p.

Wood, Anthony. 2019. Draft Atlantic Bluefish Operational Assessment for 2019. Northeast Fisheries Science Center. Woods Hole, MA.



Bluefish Fishery Performance Report

August 2019

The Mid-Atlantic Fishery Management Council's (Council) Bluefish Advisory Panel (AP) met via webinar on August 26, 2019 to review the Fishery Information Document and develop the following Fishery Performance Report. The primary purpose of this report is to contextualize catch histories by providing information about fishing effort, market trends, environmental changes, and other factors. A series of trigger questions listed below were posed to the AP to generate discussion of observations in the bluefish fishery. Please note: Advisor comments described below are not necessarily consensus or majority statements.

Advisory Panel members present: Frank Blount (RI), Angelo Cannuli, Jr (MD), Victor Hartley III (NJ), Phil Langley, Jr (MD), Arnold Leo (NY), Kevin Wark (NJ), Judith Weis (NY).

Others present: Paul Eidman, Alan Bianchi (NCDMF), Chris Batsavage (NC), Dustin Colson Leaning (ASMFC Staff), Greg DiDomenico (GSSA), Mike Celestino (NJDFW), Paul Caruso, Rich King, Robert Lorenz, Rusty Hudson (FL), Steve Cannizzo (NY), Anthony Friedrich, Paul Caruso, John Boreman and Mark Holliday (MAFMC SSC), and Jose Montanez and Matt Seeley (MAFMC Staff).

Trigger questions

1. What factors have influenced recent catch (markets/economy, environment, regulations, other factors)?
2. Are the current fishery regulations appropriate? How could they be improved?
3. What would you recommend as research priorities?
4. What else is important for the Council to know?

Factors Influencing Catch

Recreational

There was consensus on the decrease in bluefish abundance coast wide. This was prevalent in northern states where bluefish were often identified to be further offshore and not available to anglers that typically target them (private anglers may not want to travel to where the bluefish are). In the southern states, bluefish abundance may have been slightly higher, yet still much lower than previous years (since bluefish have been offshore). Small fish (1-3 lbs) were available early in the year while larger fish (5-10 lbs) were not present for long periods of time. When available, large fish were present for no more than a week at a time.

MA – Age 1-2 bluefish are seasonally available near MA when they never were before. Larger

fish did not appear.

NY – Bluefish are not as ubiquitous as they once were. Off the East End of Long Island, the larger bluefish arrived in late May as usual, but thereafter there has been a very noticeable lack of smaller bluefish (1-3 lbs.) that typically are abundant in the bays.

NY – Often, the target species is sea bass, but when people run into bluefish, they harvest them regardless of the trip.

NJ – Charter fishermen noted that bluefish were abundant in 2017, yet the large fish did not show up at all in 2018. Little activity in the shallows that ended quickly. Surf casting was nonexistent. But, 10-18” bluefish are accessible inshore because anglers are targeting Spanish mackerel and bonito.

NJ – Shark boats have reported bluefish offshore (>30 miles) but party boats do not go that far to fish for bluefish. Thus, the fishery has shifted further offshore. People are not targeting local bluefish due to availability. The typical big bay run did not really happen, but some surf fishing has still proven successful. Often, bluefish have been reported offshore where anglers were targeting tuna (30-50 fathoms). Additionally, for-hire anglers typically observe smaller fish early on (1.5-2.5 lbs) and rarely see fish above 4-5 lbs. This may coincide with not targeting them offshore.

MD – Bluefish are targeted due to the striped bass northern migration in the Chesapeake Bay. Bluefish numbers have been down, and the mackerel numbers have been dominating the fishery. Role reversal compared to recent bluefish dominated years – 80% mackerel, 20% bluefish.

MD – 2017: huge influx of large fish, 2018: abundance went down, 2019: large fish coastal in state waters. Not targeted from the charter perspective. As people target Spanish mackerel, they encounter consistent 5-8 lb fish hanging around throughout the summer around the inlet on the nearshore shore.

MD – Party/Charter: 10 fish per angler has been adequate. Education – fresh bluefish is good to eat. Continue with outreach.

NY/NC – For-hire is slightly down in recent years due to restrictive bag limits for species like striped bass, which leads to lower directed trips. Since a bluefish trip is any trip where a bluefish is harvested, lower party/charter trips will result in less bluefish for-hire trips. Yet, not all states are experiencing a decrease in the for hire.

NC – 10 fish is enough

NY – need the 15 fish (the perception you can catch to the higher limit helps sell trips)

NC – Bluefish appear to have become more important as a target species to the recreational and for-hire fisheries in recent years, perhaps due to the lack of availability of state managed species. In the last few years, it seems that bluefish schools are smaller and a *little less* available. This year we never had the large fish. They often ranged from 1-3 lbs. Large fish were not targeted as much because we do not usually travel offshore for bluefish.

NC – Fish are consistently under 3 lbs. but are available in the surf throughout the winter. At times, people are using these schools of fish for crab bait even though bluefish have become more accepted as a culinary target.

NC – Lower bluefish availability leads to less interest in targeting them.

NC – In recent years, there have been some good year classes for nearshore species (e.g. Sea trout and red drum) in the fall. Typically, these species being available to fishermen results in less people targeting bluefish on party/charter vessels.

Commercial

NY – Have not seen such a poor showing of bluefish in a long time. Small run in the spring, but completely died off shortly after. Commercial report coincides with the available data. Bluefish in the Bay fishery on the east end of Long Island have been very scarce.

NY – Prefer status quo management from 2018 to 2019. Bluefish are no longer as ubiquitous as they once were. It is important to focus concerns on the young of the year. Fishing is not the problem, it is the availability which is driven by climate and water quality.

NY/NJ – Not likely that NY will exceed the commercial quota. Maintain the ability to transfer quota. Appreciate that quota transfers can happen but does not want to see fleets disabled due to loss of quota.

NJ – Strong and consistent recruitment events over the last few years. Will have a better estimate of abundance in late Fall because fish move out of the bays. Effort is down after a week and a half run of bigger fish (fish are staying offshore – environmental issues). Not many people are targeting them – landings down and recruitment constant.

NC – Proper care of bluefish is very important, and outreach should be conducted on how to handle bluefish from when they are landed until when they are consumed.

Public Comment – A member of the public from the southern region suggested creating another sector allocation that is subsistence fishing to support the anglers that are not commercially harvesting yet fishing “harder” in order to fill a freezer for the year. Responses by an AP member and other members of the public from the north wanted to make it clear that the for-hire industry does not want to see a reduction in the sector allocations for a subsistence fishery or see changes to the bag limits because many people appreciate being able to harvest the full limit and it offers incentive to go fishing.

Market/Economic Conditions

NY – Bluefish were available to sell for a very short period. They sold for \$.70-.90/lb until fish were so scarce the gill netters stopped setting for them. For the second half of August, bluefish have been almost nonexistent in the local markets.

NJ – Point Pleasant will often catch and market bluefish successfully in November and December.

NJ/VA – Prices have been as high as \$1.75/lb, which depends on volume. The small steady supply has been getting the money and we do our best to not oversaturate the market. People's perception on the market has changed and it has been hard to gauge due to the availability.

NC – Bluefish are becoming increasingly important to the recreational fishery, especially to the for-hire sector due to the decrease in abundance of other nearshore available species. Ultimately, if the large run of big fish occurs, it is a very good thing for the bluefish fishery.

Management Issues

RI/NY/MD/NC – There was contradiction between the northern and southern states related to the current 15 fish bag limit. An AP member stated that few recreational fishermen are likely to keep more than 10 fish and that they would like to see a reduction in the recreational bag limit. Furthermore, reducing the bag limit (to 10 fish) will likely have minimal impacts on anglers and would be more in line with state-specific bag limits. Other AP members do not want to see a change to the recreational bag limit because the higher limit creates incentive for the public in the for-hire fishery (even though they often do not “limit out”).

NY – In the recreational fishery, bycatch/discard mortality may be higher than expected.

NJ – Very little commercial bluefish discards. Everything caught is brought to shore.

MD – Bag limit is not a constraining factor.

NC – Most recreational anglers do not keep a lot of bluefish. They throw back a mix of sizes depending on the individual. Need to protect abundance in the fishery. In North Carolina there is a citation program (not a ticket) which allows anglers to fill out a form at a weigh station for bluefish they release. They can receive a certificate for large bluefish in the “release” category. This promotes catch-and-release fishing.

NC – While the commercial discards are considered to be insignificant in the assessment, there is some localized bycatch in some commercial fisheries (beach seine, different trawls, and ocean drop net and estuarine flounder net fisheries) and not zero.

Research Priorities

Need to better understand the dynamics between the inshore and offshore populations. More specifically, during the spring migration, there is another component of the stock that stays way offshore and does not appear to be the same as the fish taking part of the spring migration. This offshore component of the stock seems to miss the Mid-Atlantic Bight during the migration up north (towards Montauk). It is important to investigate this migration event in order to better understand the dynamics of the stock. What are the differences between the offshore and inshore bluefish populations?

Future studies should look at the estuaries where juveniles live. The environmental conditions in the estuaries may be more important than that of the ocean for population success or decline. Researchers have found that snappers living in more polluted estuaries, eating more polluted menhaden and mummichogs, did not eat as much and did not grow as well as snappers in cleaner estuaries. The researchers did not trace them in the ocean, but suspect they are less likely to "make it" to become adults.

Research should be conducted to track down an estimate of what has caused a decline of this species. Identify the environmental factors leading to the change in stock status to better understand what environmental or non-environmental factors bluefish cue in on? What is causing more species like bluefish to move out? Dredges? Sand mining? Mobile gear? Water quality?

Conduct a post-release mortality study to identify the amount of fish released by recreational anglers that actually die. Additionally, identify how many fish are "released" dead.

Conduct environmental investigations to address shifting natural shorelines and habitat destruction.

Identify any cyclical patterns in abundance over the past 50 years. What causes these patterns (if any) and can we identify the factors that may be influencing them?

Investigate public stakeholder perception of the recreational bluefish fishery in order to identify how the public would like this fishery to look like in years to come. Bluefish is an important recreational fishery and it is important to ask the recreational fishing community to investigate how they perceive this fishery in the future. Use for-hire logbooks to see what kind of data we can capture. We want to use that data to better understand where the fish are and how to characterize the recreational fishery. This could emerge into a good educational and outreach opportunity.

Other Issues

Biological characteristics of bluefish life history need to be considered when developing catch and landings limits recommendations for this species. There is evidence that as bluefish migrate along the coast during the spring and summer there may be multiple spawning events. Recent observations are leading fishermen to believe what we think we know may be incorrect. Management should be tailor made for typical or atypical life histories, depending on the species under consideration.

The bluefish permit is open access and leads to a lot of unnecessary permits. This makes it more difficult to identify who is actually fishing, and often presents cases where what happens on the water does not equal up to who is permitted.

Appendix A

Bluefish Research Priorities

Below are the research priorities for bluefish that the Council identified in their Comprehensive Five Year (2016-2020) Research Plan. We are seeking feedback from the AP on these priorities (are they right, wrong, which are most important etc.) or other research priorities that you may have for the development of the next comprehensive research plan.

Surveys:

Fishery-Dependent

- Evaluate species associations with recreational angler trips targeting bluefish to potentially modify the bluefish recreational CPUE index used in the assessment.
- Initiate fishery-dependent sampling of offshore populations of bluefish.

Fishery-Independent

- Develop a fishery independent index that better captures older, larger fish (which would reduce reliance on MRIP sampling).

Modelling/Quantitative:

- Develop bluefish specific MSY reference points or proxies.
- Evaluate changes in selectivity of age-0 bluefish relative to water temperature.
- Evaluate methods for integrating disparate indices produced at multiple spatial and temporal scales into a stock-wide assessment model.

Biology/Life History/Habitat:

- Investigate how environmental variability may affect juvenile movements and distribution, which in turn, may affect availability.



Bluefish Fishery Information Document

August 2019

This Fishery Information Document provides a brief overview of the biology, stock condition, management system, and fishery performance for bluefish with an emphasis on 2018. Data sources for Fishery Information Documents are generally from unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources, including previous Fishery Information Documents, please visit <http://www.mafmc.org/bluefish/>.

Key Facts

- According to the most recent peer reviewed stock assessment (2015), bluefish is not overfished and overfishing is not occurring, *but an assessment update will be final by the end of August and will change estimated stock biomass, biological reference points, fishing mortality, and our understanding of stock status.*
- In 2018, the recreational harvest limit increased by 1.93 million pounds and the commercial quota decreased by 1.3 million pounds. Cumulatively, the recreational and commercial fishery recorded an underage of 12.98 million pounds.
- Old MRIP (BASE) recreational landings decreased by ~62% from 2017 to 2018 (9.52 million pounds to 3.64 million pounds). New MRIP (FCAL) recreational landings decreased by ~59% from 2017 to 2018 (32.02 million pounds to 13.27 million pounds).
- Commercial landings decreased by ~40% from 2017 to 2018 (3.64 million pounds to 2.20 million pounds).

Basic Biology

Bluefish are found worldwide in tropical and subtropical waters, but in the western North Atlantic range from Nova Scotia and Bermuda to Argentina. Bluefish travel in schools of like-sized individuals and undertake seasonal migrations, moving into the Middle Atlantic Bight (MAB) during spring and then south or farther offshore during fall. Within the MAB they occur in large bays and estuaries as well as across the entire continental shelf. Juvenile stages have been recorded in all estuaries within the MAB, but eggs and larvae occur in oceanic waters (Able and Fahay 1998). Bluefish have fast growth rates and reach lengths of 3.5 ft and can weigh up to 27 pounds (Bigelow and Schroeder 1953). Bluefish live to age 12 and greater (Salerno et al. 2001).

Bluefish eat a wide variety of prey items. The species has been described by Bigelow and Schroeder (1953) as “perhaps the most ferocious and bloodthirsty fish in the sea, leaving in its wake a trail of dead and mangled mackerel, menhaden, herring, alewives, and other species on which it preys.”

Bluefish born in a given year (young of the year) typically fall into two distinct size classes suggesting that there are two spawning events along the east coast. Studies suggest, however, that spawning is a single, continuous event, but that young are lost from the middle portion resulting in the appearance of a split season (Smith et al. 1994). As a result of the bimodal size distribution, young are referred to as spring-spawned or summer-spawned. In the MAB, spring-spawned bluefish appear to be the dominant component of the stock.

Status of the Stock

The bluefish benchmark stock assessment was peer reviewed in June 2015 and approved for use by management at SAW/SARC 60. This benchmark assessment uses a forward-projecting statistical catch-at-age model called ASAP (Age Structured Assessment Program). For the most recent benchmark, the catch-at-age matrices were completely reconstructed to incorporate new age data, including archived historical samples that had not been processed at the time the last benchmark (SAW/SARC 41; 2005) was conducted, and to correct aging errors in the earlier years of the time series (NEFSC 2015).

The biological reference points estimated in the previous benchmark assessment (SAW/SARC 41) were MSY reference points for F and total biomass (F_{MSY} , B_{MSY}). However, MSY reference points require a reliable stock-recruitment relationship. The stock-recruitment relationship for bluefish is poorly defined, due to the lack of information on recruitment at small stock sizes, with steepness estimated to be close to one for most model runs (NEFSC 2015). Therefore, in SAW/SARC 60, SPR-based (spawn per recruit) reference points were used as a proxy for MSY reference points.

Results from the 2015 benchmark stock assessment indicate that the bluefish stock was not overfished and overfishing was not occurring in 2014 relative to the biological reference points (BRPs) from the 2015 SAW/SARC 60. Modeling results indicated that the estimated SSB was 190.77 million pounds (86,534 mt) in 2014 (85 percent of the accepted reference point SSB_{MSY} proxy = $SSB_{35\%SPR}$ = 223.42 million pounds or 101,343 mt). Spawning stock biomass declined since the beginning of the time series, from a high of 340.90 million pounds (154,633 mt) in 1985 to a low of 116.34 million pounds (52,774 mt) in 1997, before increasing again. The stock spawning biomass average for the 1985-2014 time series is 175.15 million pounds (79,449 mt). Fully-selected fishing mortality in 2014 was estimated to be 0.157, below the F threshold (F_{MSY} proxy = $F_{35\%SPR}$ = 0.19). Fully selected F peaked in 1987 at 0.477 and then declined gradually since then, with a time series average of 0.284.

2019 Stock Assessment Update

Bluefish is currently going through an operational assessment for 2020 and beyond and will be final by the end of August 2019. The update will include the new recalibrated MRIP values and

is expected to change the estimated stock biomass, current biological reference points, and fishing mortality.

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council or MAFMC) and the Atlantic States Marine Fisheries Commission (ASMFC) work cooperatively to develop fishery regulations for bluefish off the east coast of the United States. The Council and Commission work in conjunction with the National Marine Fisheries Service (NMFS), which serves as the federal implementation and enforcement entity. This cooperative management endeavor was developed because a significant portion of the catch is taken from both state waters (0-3 miles offshore) and federal waters (3-200 miles offshore, also known as the Exclusive Economic Zone or EEZ). The management unit for bluefish is the U.S. waters in the western Atlantic Ocean.

The Bluefish Fishery Management Plan (FMP) was implemented in 1990 and established the Mid-Atlantic Fishery Management Council's management authority over the fishery in federal waters. Amendment 1, implemented in 2000, addressed stock rebuilding and created the Bluefish Monitoring Committee which meets annually to make management measure recommendations to the Council. Amendment 3 incorporated the development of annual catch limits (ACLs) and accountability measures (AMs) into the specification process and Amendment 4 modified recreational accountability measures to accommodate uncertainty in recreational management and catch estimation. The original FMP and subsequent amendments and frameworks are available at: <http://www.mafmc.org/fisheries/fmp/bluefish>.

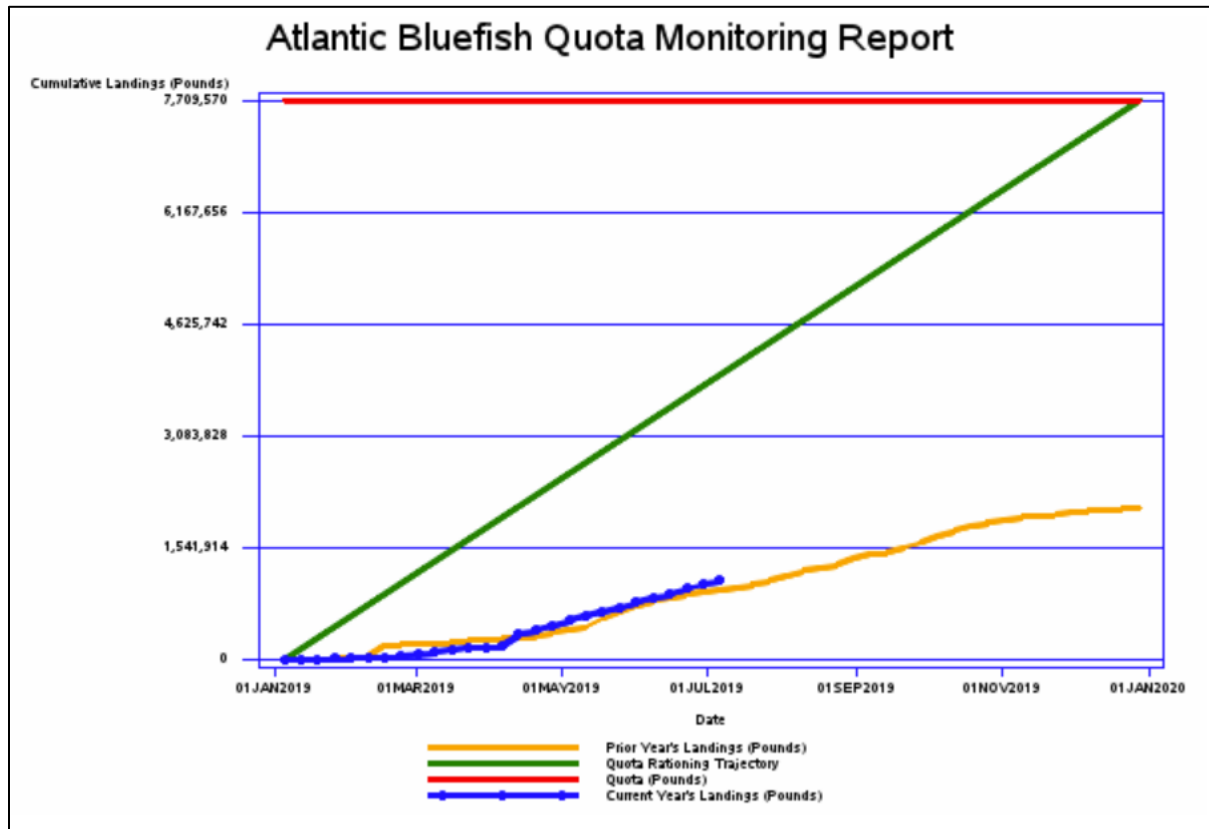
For bluefish, the annual catch target (ACT) is split 83 percent and 17 percent into recreational and commercial ACTs, respectively, and the discarded component of that catch is deducted to arrive at recreational and commercial total allowable landings (TAL). Additionally, landings above the expected recreational harvest can be "transferred" from the recreational to the commercial fishery as long as the final commercial quota does not exceed 10.5 million pounds.

The Council's Scientific and Statistical Committee (SSC) reviews assessment results and the Advisory Panel's fishery performance report and determines the allowable biological catch (ABC) for the upcoming year. The Council's Bluefish Monitoring Committee develops and recommends specific coastwide management measures (commercial quota, recreational harvest limit) that will achieve the catch target and makes further adjustments to total catch as needed based on management uncertainty. Finally, the Council and Board meet jointly to develop recommendations to be submitted to the NMFS.

Fishery Performance Relative to Management Measures

The current commercial landings and fishery performance is slightly ahead of the 2018 landings (Figure 1; as of July 8, 2019). The recreational and commercial landings relative to specified management measures are provided in Table 1. Except for 2007, the bluefish fishery has never exceeded the TAL. In 2007, the recreational fishery exceeded the recreational harvest limit by

about 2.69 million pounds, and although the commercial fishery underperformed by 1.18 million pounds, the combined landings (29.27 million pounds) were above the specified TAL (27.76 million pounds). In 2018, the recreational fishery landed 3.64 million pounds compared to the 11.58 million pounds RHL (a 7.94-million-pound underage), and the commercial fishery landed 2.20 million pounds compared to the quota of 7.24 million pounds (a 5.04 million pounds underage). Combined landings for the recreational and commercial fisheries in 2018 (5.84 million pounds) resulted in an underage of 12.98 million pounds when compared to the TAL



(18.82 million pounds). As of July 10, 2019, 1.05 million pounds of bluefish had been landed by the commercial fishery; this represents ~14 percent of the 2019 commercial quota (7.71 million pounds).

Figure 1. Atlantic bluefish commercial landings for 2019 fishing year to date (through July 17, 2019). http://www.nero.noaa.gov/ro/fso/reports/reports_frame.htm.

Table 1. Summary of bluefish management measures, 2000 – 2019 (Values are in million pounds).

Management Measures	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019⁸
TAC ¹ / ABC ²	34.22	29.15	32.03	31.89	34.08	34.38	31.74	32.04	27.47	24.43	21.54	19.45	20.64	21.81	21.81
TAL ³	30.85	24.8	27.76	28.16	29.36	29.26	27.29	28.27	23.86	21.08	18.19	16.46	18.19	18.82	19.33
Comm. Quota ⁴	10.5	8.08	8.69	7.71	9.83	10.21	9.38	10.32	9.08	7.46	5.24	4.88	8.54	7.24	7.71
Comm. Landings ⁵	7.04	6.98	7.51	6.12	7.1	7.55	5.61	4.66	4.12	4.77	4.02	4.1	3.64	2.20	
Rec. Harvest Limit ⁴	20.35	16.72	19.07	20.45	19.53	18.63	17.81	17.46	14.07	13.62	12.95	11.58	9.65	11.58	11.62
Rec. Landings ⁶	19.86	16.65	21.76	19.79	14.47	16.34	11.5	11.84	16.46	10.46	11.67	9.54	9.52	3.64	
Rec. Possession Limit (# fish)	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Total Landings	26.9	23.63	29.27	25.91	21.57	23.89	17.11	16.5	20.58	15.23	15.69	13.64	13.16	5.84	
Overage/Underage	-3.95	-1.17	1.51	-2.25	-7.79	-5.37	-10.18	-11.77	-3.28	-5.85	-2.5	-2.82	-5.03	-12.98	
Total Catch ⁷	31.55	28.08	35.12	31.83	25.10	27.93	20.39	19.26	24.06	17.96	18.65	16.09	15.65	6.96	
Overage/ Underage	-2.67	-1.07	3.09	-0.06	-8.98	-6.45	-11.35	-12.78	-3.41	-6.47	-2.89	-3.36	-4.99	-14.85	

¹ Through 2011. ² 2012 fwd. ³ Not adjusted for RSA. ⁴ Adjusted downward for RSA. ⁵ Dealer and South Atlantic Canvas data used to generate values from 2000-2011; Dealer data used to generate values from 2012-2018. ⁶ MRIP. ⁷ Recreational discards were calculated assuming MRIP mean weight of fish landed or harvested. ⁸ Values for 2020 and 2021 will be presented using the FCAL (new re-calibrated) MRIP numbers. Years 2005-2015 are presented with the BASE (old) MRIP numbers.

Landings History

Bluefish catches were estimated via the Marine Recreational Fisheries Statistic Survey (MRFSS) starting in 1981 through 2003. Recreational data for years 2004 and later are available from the Marine Recreational Information Program (MRIP), the data collection that followed MRFSS.

From the early 1980s to the early 1990s, recreational landings declined about 70% (avg. 1981-1983 = 89.14 million pounds; avg. 1991-1993 = 25.85 million pounds). Recreational landings continued to decline at a somewhat slower rate until reaching a low level of 8.25 million pounds in 1999, but since have grown to a peak of 21.70 million pounds in 2007. Now, recreational landings are at an all-time low of 3.6 million pounds for 2018.

Commercial landings have been relatively stable throughout recent history, yet a notable decrease occurred from 2017-2018 (Figure 2). Commercial discards are insignificant and are not estimated in the current assessment.

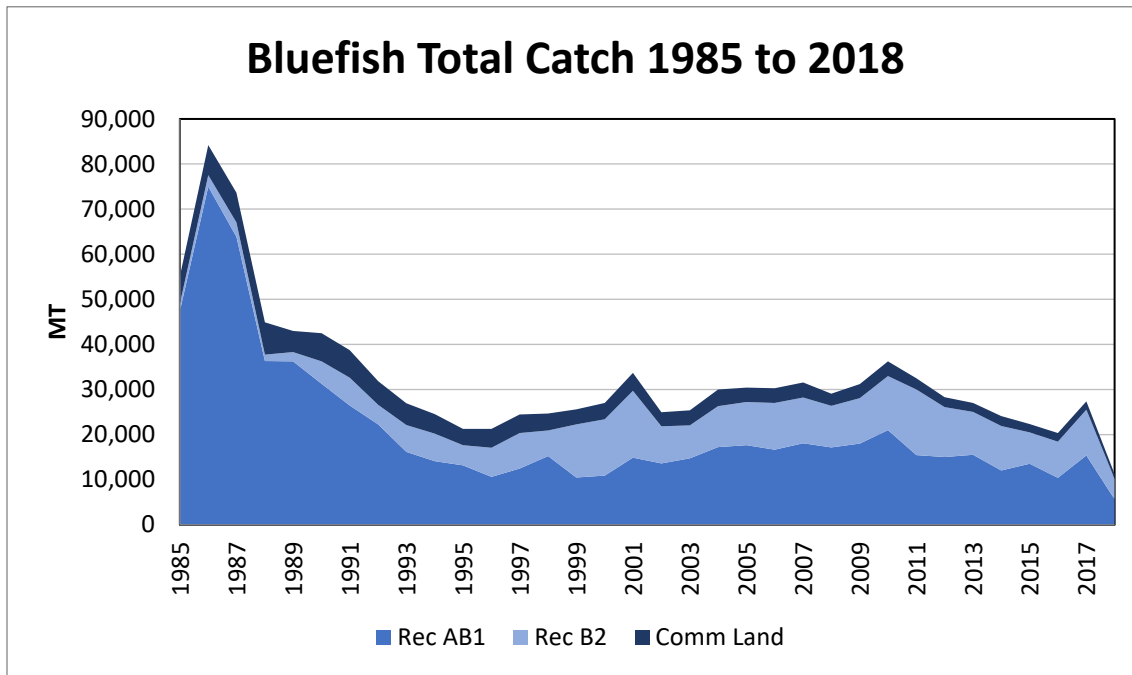


Figure 2. Bluefish catch (landings [AB1] and discards [B2]), 1985-2018. (Source: Anthony Wood, Personal Communication 2019)

Recreational Fishery

Recreational fishery data is presented as estimated from MRIP using both the new re-calibrated (BASE or new) and old (FCAL or old) data. Trends in recreational trips associated with targeting or harvesting bluefish from 1991 to 2018 are provided in Table 2. The lowest annual estimate of bluefish trips was 1.64 million and 5.75 million trips in 2017 and 2018, respectively using BASE and FCAL estimates. The highest annual estimate of bluefish trips in this timeframe was 5.95 million and 13.90 million trips in 1991 respectively using BASE and FCAL estimates. For the last 5 years (2014-2018), the number of bluefish trips have ranged from 1.64 million trips in

2017 to 2.17 million trips in 2017 using only the BASE MRIP data. Base estimates for number of trips for 2018 was unavailable. For the last 5 years (2014-2018), the number of bluefish trips have ranged from 5.75 million trips in 2018 to 9.62 million trips in 2014 using only the FCAL MRIP data.

Table 2. Number of bluefish recreational fishing trips, recreational harvest, and recreational landings per trip from 1991 to 2018.

Year	# of bluefish trips ^a	Base Recreational Harvest (N)	Base Recreational Harvest (lbs)	Recreational landings per “bluefish” trip	# of bluefish trips ^a	FCAL Recreational Harvest (N)	FCAL Recreational Harvest (lbs)	Recreational landings per “bluefish” trip
	Base MRIP Estimates				Re-Calibrated MRIP Estimates			
1991	5,948,808	11,942,608	32,997,411	2.0	13,896,933	27,317,926	59,792,834	2.0
1992	4,549,536	7,157,754	24,275,171	1.6	11,409,027	20,180,578	41,217,703	1.8
1993	4,269,162	5,725,355	20,292,072	1.3	11,826,365	15,369,463	37,415,750	1.3
1994	3,587,131	5,767,953	15,540,854	1.6	9,721,530	13,063,628	30,145,680	1.3
1995	3,608,325	5,167,979	14,306,582	1.4	9,968,256	11,532,807	27,710,092	1.2
1996	2,820,059	4,205,103	11,745,938	1.5	7,876,695	11,126,333	23,207,235	1.4
1997	2,384,133	5,413,036	14,301,761	2.3	6,383,072	12,400,982	27,039,375	1.9
1998	2,180,471	4,202,111	12,334,000	1.9	7,638,343	13,397,302	32,880,412	1.8
1999	1,727,175	3,681,841	8,253,113	2.1	7,840,089	16,878,789	25,106,100	2.2
2000	2,041,450	4,897,008	10,605,827	2.4	6,449,833	12,879,485	23,357,120	2.0
2001	2,661,032	6,663,237	13,229,770	2.5	8,161,746	18,048,645	31,654,978	2.2
2002	2,324,253	5,300,189	11,371,485	2.3	8,381,422	17,607,380	30,654,388	2.1
2003	2,647,840	6,045,062	13,135,895	2.3	7,769,721	16,411,932	32,758,670	2.1
2004	2,901,956	7,250,407	17,316,476	2.5	8,894,616	18,631,904	37,133,463	2.1
2005	3,240,410	7,949,179	19,862,847	2.5	9,024,550	18,341,452	37,742,807	2.0
2006	2,800,204	7,035,179	16,653,456	2.5	8,255,002	19,397,272	36,081,958	2.3
2007	3,620,374	8,373,899	21,760,882	2.3	9,655,930	19,189,747	40,239,101	2.0
2008	3,024,787	6,664,150	19,793,321	2.2	8,044,324	14,845,435	36,166,834	1.8
2009	2,088,857	5,194,242	14,472,305	2.5	7,972,341	18,085,386	40,731,438	2.3
2010	2,468,273	6,090,830	16,339,283	2.5	9,773,363	21,929,517	46,302,792	2.2
2011	2,128,166	5,061,391	11,497,371	2.4	8,492,874	20,814,884	34,218,748	2.5
2012	2,394,988	5,523,282	11,842,303	2.3	9,655,507	18,578,838	32,530,917	1.9
2013	1,811,087	5,743,970	16,464,369	3.2	6,394,975	19,975,051	34,398,327	3.1
2014	2,401,822	5,875,773	10,455,687	2.4	9,615,976	21,510,651	27,044,276	2.2
2015	1,710,020	3,996,803	11,673,242	2.3	7,001,696	13,725,106	30,098,649	2.0
2016	2,166,975	4,301,220	9,537,923	2.0	8,625,069	14,899,723	24,155,304	1.7
2017	1,638,890	3,013,668	9,519,745	1.8	8,264,782	13,842,164	32,023,497	1.7
2018	N/A	2,777,026	3,639,697	N/A	5,749,291	10,245,710	13,270,862	1.8

^a Estimated number of recreational fishing trips where the primary target was bluefish or bluefish were harvested regardless of target, Maine – Florida’s East Coast. Source: MRFSS (1991-2003)/MRIP (2004 forward).

Recreational Landings by State

Recreational catch and harvest by state for 2018 are provided in Table 3. The greatest overall catches (includes discards) presented as BASE MRIP and FCAL, respectively occurred in North Carolina with 11.22 and 3.00 million fish, Florida with 1.27 and 5.21 million fish, and New Jersey with 1.10 and 3.93 million fish.

The greatest harvest of bluefish by weight in 2018 presented as BASE MRIP and FCAL, respectively occurred in North Carolina with 767,364 and 2.63 million pounds, followed by Florida with 741,516 and 4.53 million pounds, and New Jersey with 613,605 and 2.01 million pounds. According to MRIP, 0 bluefish were caught in Maine and New Hampshire. Average weights, based on dividing MRIP landings in weight by landings in number for each state, suggest that bluefish size tends to increase toward the north along the Atlantic coast (outside of Florida).

Table 3. MRIP estimates of 2018 recreational harvest and total catch for bluefish.

State	Harvest			Catch	Harvest			Catch
	Pounds	Number	Average wt (lbs)	Number	Pounds	Number	Average wt (lbs)	Number
	Base MRIP (Old) Estimates				FCAL MRIP (New) Estimates			
ME	0	0	0.00	0	0	0	0.00	0
NH	0	0	0.00	0	0	0	0.00	0
MA	328,240	82,982	3.96	288,293	611,557	182,424	3.35	714,225
RI	119,961	38,158	3.14	105,594	210,033	119,801	1.75	271,594
CT	238,815	132,813	0.58	413,022	340,666	312,022	1.09	817,150
NY	425,036	413,365	1.03	1,123,132	1,399,517	1,203,567	1.16	3,905,614
NJ	613,605	424,754	1.44	1,106,422	2,007,110	1,421,477	1.41	3,933,439
DE	238,815	132,813	0.58	413,022	315,105	75,703	4.16	611,903
MD	152,459	102,984	1.48	253,625	493,192	274,834	1.79	692,643
VA	70,549	109,142	0.65	234,656	264,534	443,112	0.60	870,958
NC	767,364	943,297	0.81	2,995,238	2,630,685	3,304,587	0.80	11,216,797
SC	93,814	146,362	0.64	415,794	403,141	765,113	0.53	2,295,592
GA	10,551	13,198	0.80	55,769	70,284	90,991	0.77	386,195
FL	741,516	345,036	2.15	1,270,688	4,525,038	2,052,080	2.21	5,212,593
Total	3,639,697	2,777,026	1.31	8,465,496	13,270,862	10,245,711	1.30	30,928,703

Recreational Landings by Mode

Figure 3 reflects re-calibrated MRIP-based estimates of landings by mode (1991 through 2018) and indicates that the recent primary landing modes for bluefish are private boats and shore mode. In 2018, 11% (BASE) and 74% (FCAL) of the landings of bluefish on a coastwide basis came from shore, followed by 36% (BASE) and 23% (FCAL) private/rental and 53% (BASE) and 3% (FCAL) for-hire. Over the last five years (2014-2018), 32% (BASE) and 54% (FCAL) of the total bluefish landings came from shore, 46% (BASE) and 39% (FCAL) from private/rental boats, and 22% (BASE) and 7% (FCAL) from for-hire boats.

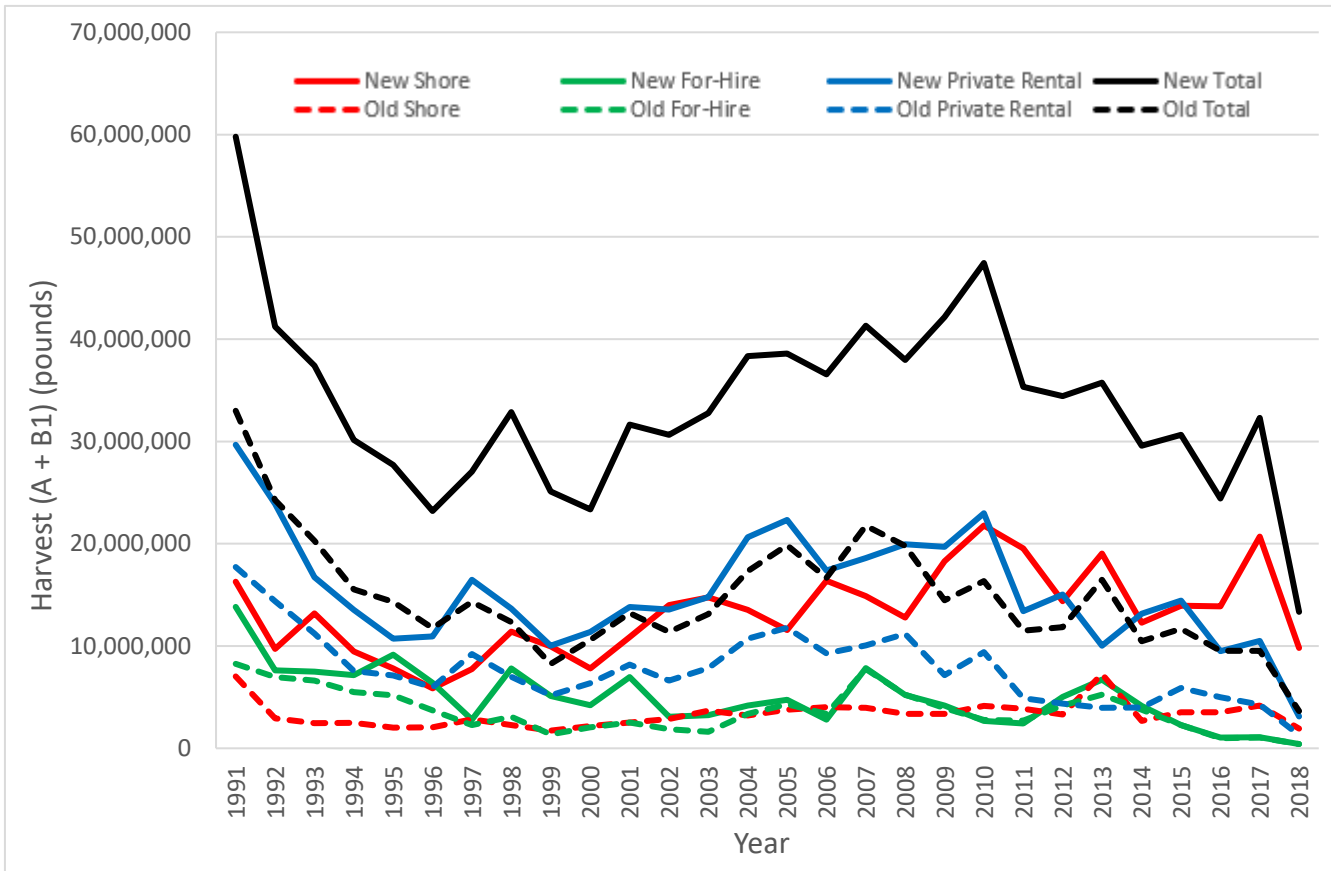


Figure 3. Bluefish harvest (pounds) by recreational fishermen by mode, Atlantic Coast, 1991-2018. Old MRIP data is back calculated.

Recreational Landings by Area

MRIP classifies catch into three fishing areas, inland, nearshore ocean (< 3 mi), and offshore ocean (> 3 mi). In 2018, about 37% (BASE) and 27% (FCAL) of the landings of bluefish on a coastwide basis came from inland waters, followed by nearshore ocean at 56% (BASE) and 67% (FCAL) (Figure 4), and offshore waters at 8% (BASE) and 6% (FCAL). Over the last five years (2014-2018), 52% (BASE) 45% (FCAL) and of the total bluefish landings came from inland waters, 38% (BASE) and 50% (FCAL) from nearshore ocean, and 10% (BASE) and 5% (FCAL) from offshore ocean.

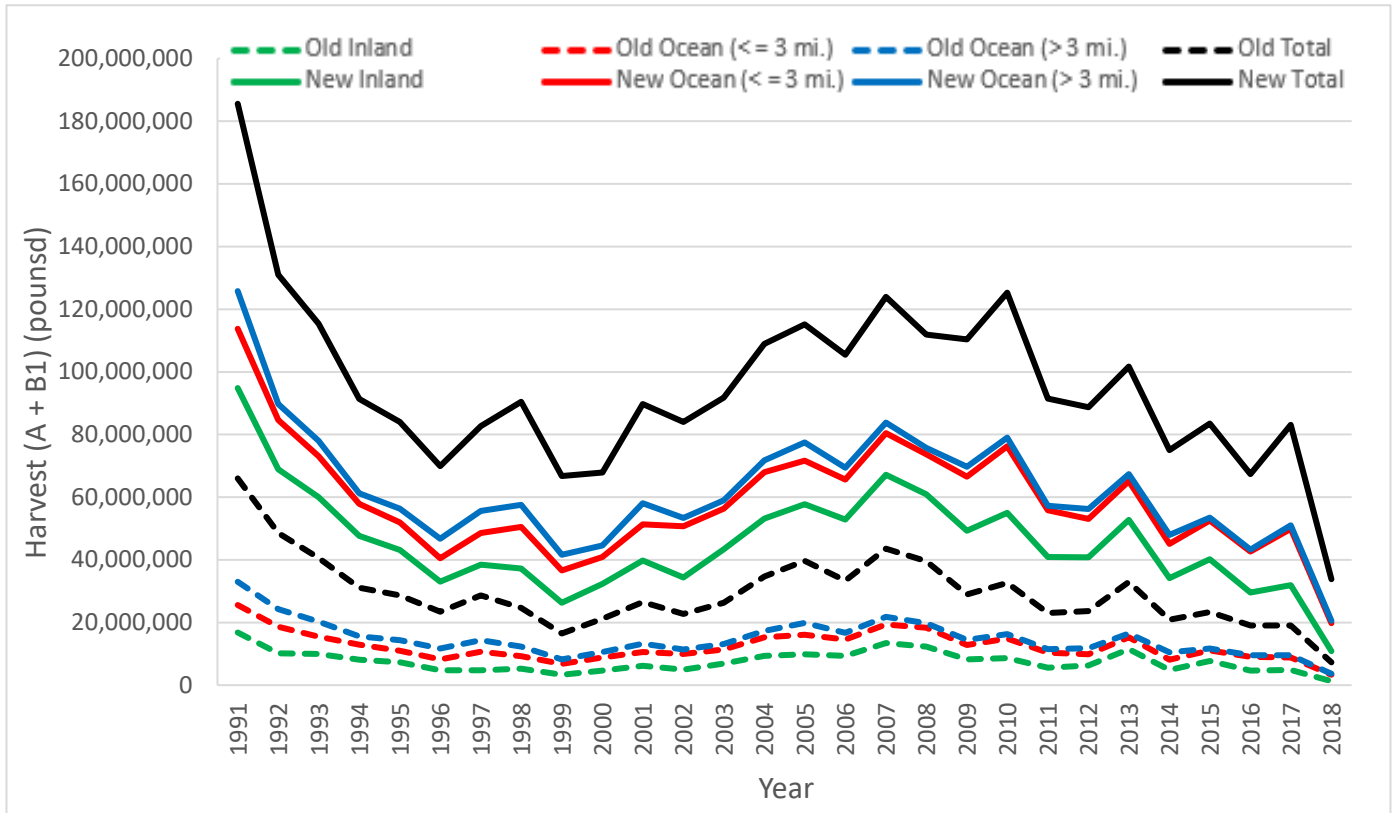


Figure 4. Bluefish harvest (pounds) by recreational catch by area, Atlantic Coast, 1991-2018. Old MRIP data is back calculated.

Recreational Discards

In the recreational fishery, bluefish released alive (B2) are estimated by MRIP. To calculate discards, a 15% mortality rate is applied to the B2 value and then multiplies by the MRIP estimated average weight. In 2017, discards were 1.03 million lbs and 5.52 million lbs for BASE and FCAL, respectively. In 2018, FCAL discards were 4.03 million lbs (Figure 5).

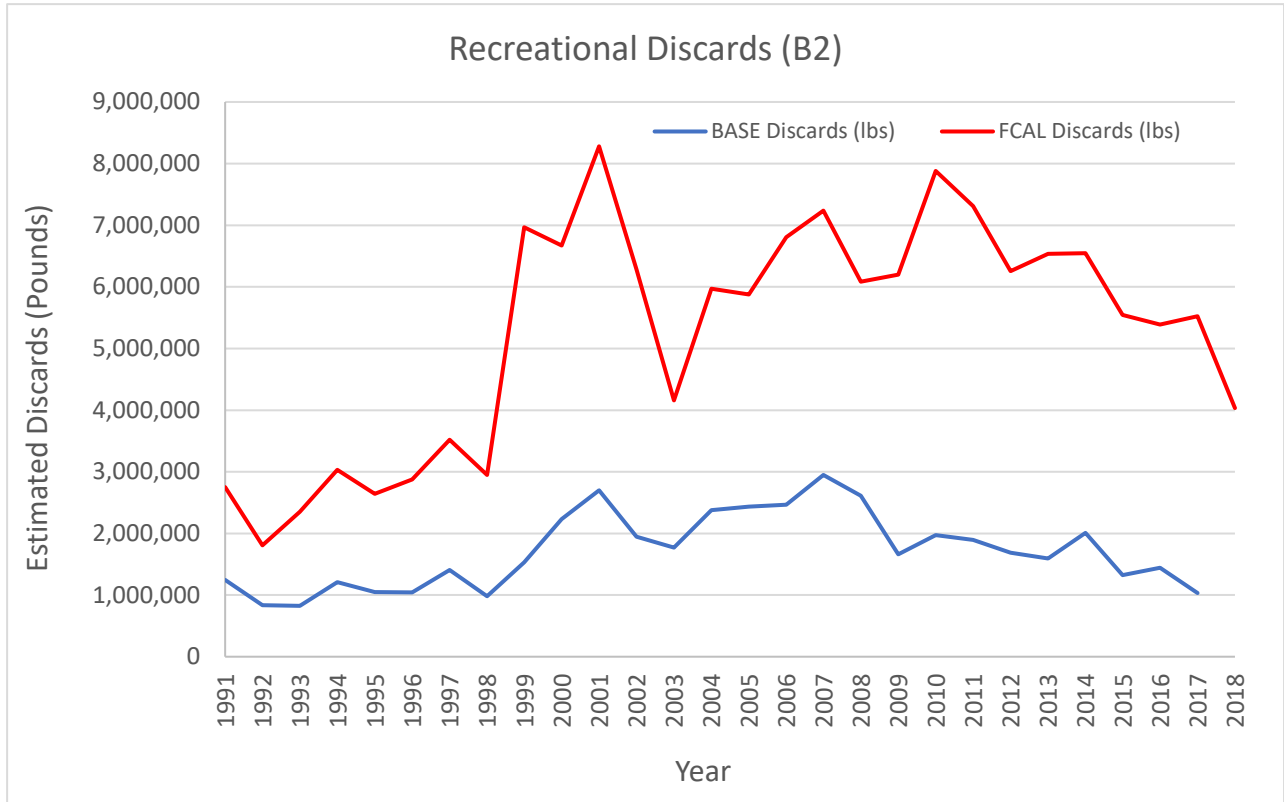


Figure 5. Bluefish MRIP estimated BASE and FCAL discards for 1991-2018. Released alive fish are assumed to have 15% chance of mortality, which is applied to the B2 values.

Commercial Fishery

Vessel and Dealer Activity

Federal permit data indicate that 2439 commercial bluefish permits were issued in 2018.¹ A subset of federally permitted vessels was active in 2018 with dealer reports identifying 476 vessels with commercial bluefish permits that actually landed bluefish. Of the 407 federally permitted bluefish dealers in 2018, there were 149 dealers who actually bought bluefish.

Landings by Gear

Dealer data for 2018 indicate that the majority of the bluefish landings were taken by gillnet (50%), followed by unknown gear (26%), otter trawl/bottom fish (9%), other (9%) and handline (6%).

Landings by Area

VTR data were used to identify all NMFS statistical areas that accounted for 5 percent or more of the Atlantic bluefish catch or areas which individually accounted for 5 percent or greater of the trips which caught bluefish in 2018 (Table 4). Seven statistical areas accounted for approximately 82% of the VTR-reported catch in 2018. Statistical area 539 was responsible for the highest percentage of the catch, with statistical area 611 having the majority of trips that caught bluefish (Table 4). A map of the statistical areas that accounted for a percentage of the Atlantic bluefish catch is shown in Figure 6.

Table 4. Statistical areas that accounted for at least 5 percent of the total Atlantic bluefish catch or 5 percent or greater of the trips which caught bluefish in 2018, with associated number of trips.

Statistical area	Pounds of bluefish caught	Percent of 2018 commercial bluefish catch	Number of trips	Percent of 2018 commercial bluefish trips that caught bluefish
539	142,122	24%	812	20%
632	95,034	16%	18	<1%
611	71,981	12%	1307	32%
613	68,397	12%	548	13%
636	34,838	6%	37	1%
616	33,657	6%	152	4%
612	32,521	6%	281	7%

¹In addition, there were 834 party/charter bluefish permit issued in 2018. A subset of federally permitted party/charter vessels was active in 2018 with VTR reports identifying 270 vessels with party/charter bluefish permits that actually landed bluefish.

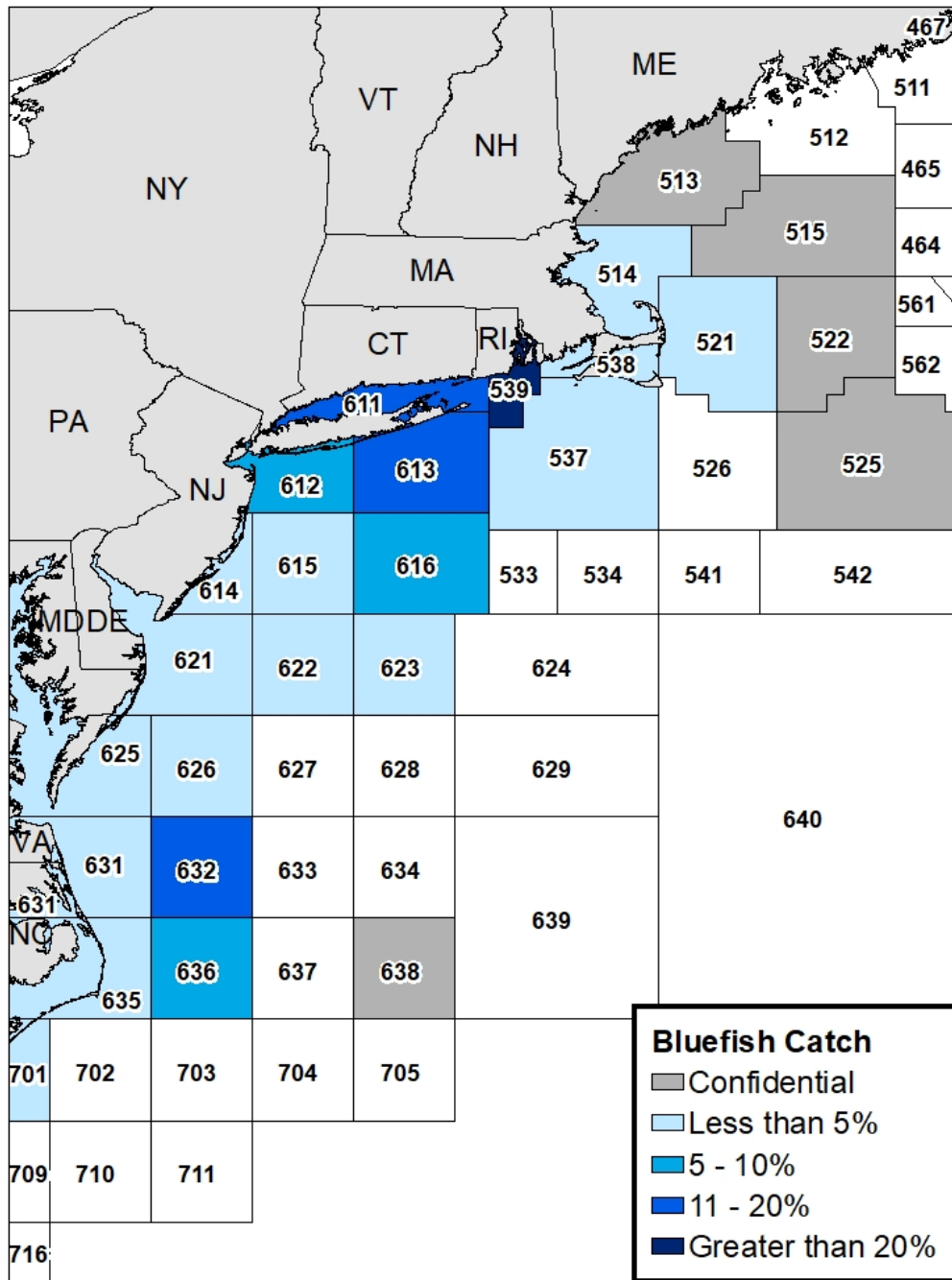


Figure 6. NMFS Statistical Areas, highlighting those that each accounted for a percentage of the commercial bluefish catch in 2018.

The top commercial landings ports for bluefish in 2018 are shown in Table 5. Six ports qualified as "top bluefish ports," i.e., those ports where 100,000 pounds or more of bluefish were landed. Wanchese, NC was the most active commercial bluefish port with almost 300,000 pounds landed. The ports and communities that are dependent on bluefish are described in Amendment 1 to the FMP (available at <http://www.mafmc.org/fisheries/fmp/bluefish>). Additional information on "Community Profiles for the Northeast US Fisheries" can be found at http://www.nefsc.noaa.gov/read/socialsci/community_profiles/.

Table 5. Top ports of bluefish landings (in pounds), based on NMFS 2018 dealer data.

Port ^a	Pounds	% of total commercial bluefish landings	# vessels
Wanchese, NC	293,089	13%	28
Hatteras, NC	243,543	11%	12
Point Judith, RI	189,249	9%	102
Montauk, NY	188,152	9%	87
Brevard, FL (other)	128,674	6%	3

^a Since this table includes only the "top ports" (ports where landings of bluefish were > 100,000 pounds), it does not include all landings for the year.

Revenue

According to dealer data, commercial vessels landed about 2.20 million pounds of bluefish valued at approximately \$2.08 million in 2018. Average coastwide ex-vessel price of bluefish was \$0.94 per pound in 2018, a ~3% increase from the previous year (2017 price = \$0.73 per pound). The relative value of bluefish is very low among commercially landed species, less than 1% of the total value, respectively of all finfish and shellfish landed along the U.S. Atlantic coast in 2018. A time series of bluefish revenue and price is provided in Figure 7.

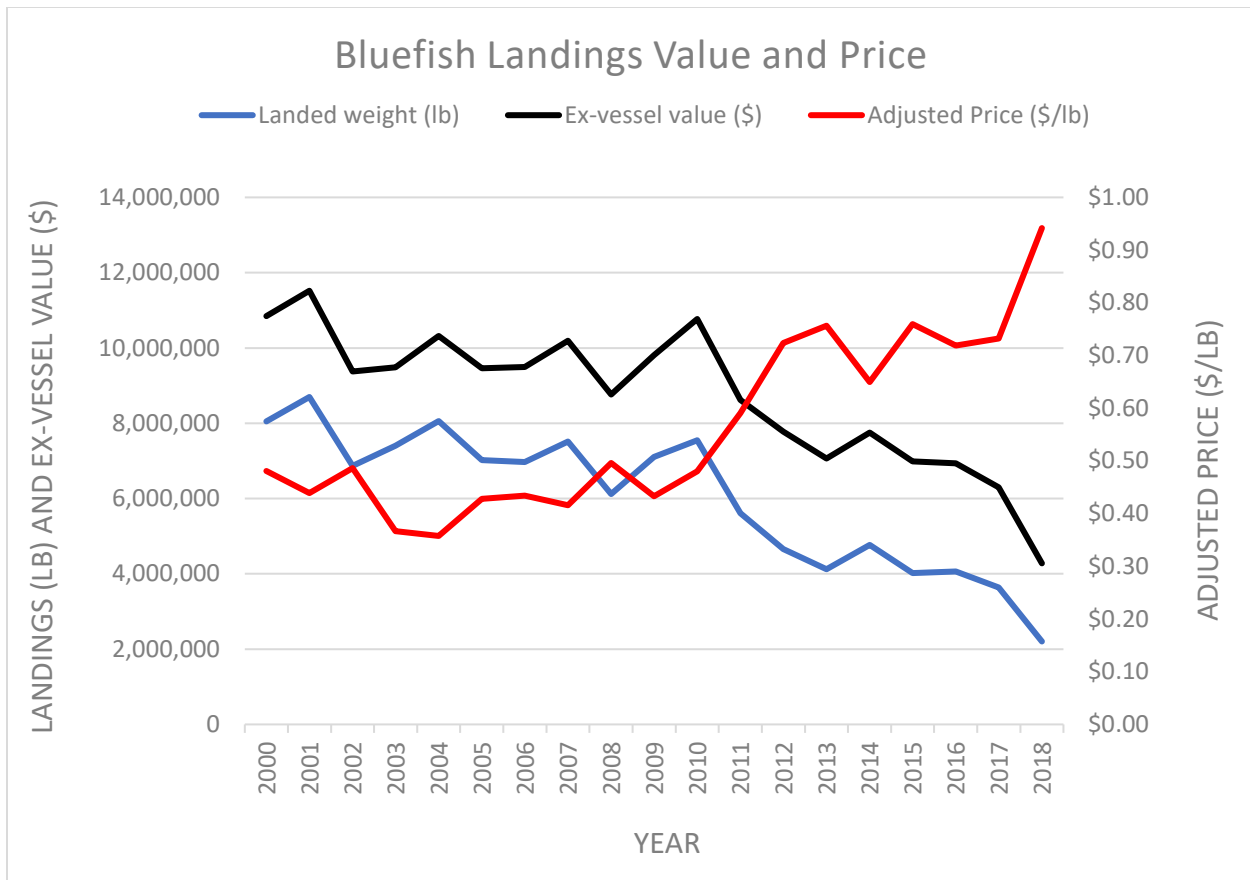


Figure 7. Landings, ex-vessel value, and price (adjusted to 2018 real dollars) for bluefish, 2000-2018.

Bycatch

The commercial fishery for bluefish is primarily prosecuted with gillnets and handlines, although there are other small localized fisheries, such as the beach seine fishery that operates along the Outer Banks of North Carolina that also catch bluefish. Many of these fisheries do not fish exclusively for bluefish, but target a combination of species including croaker, mullet, Spanish mackerel, spot, striped bass, and weakfish. Given the mixed-species nature of the bluefish fishery, incidental catch of non-target species is not directly attributable to the bluefish fishery.

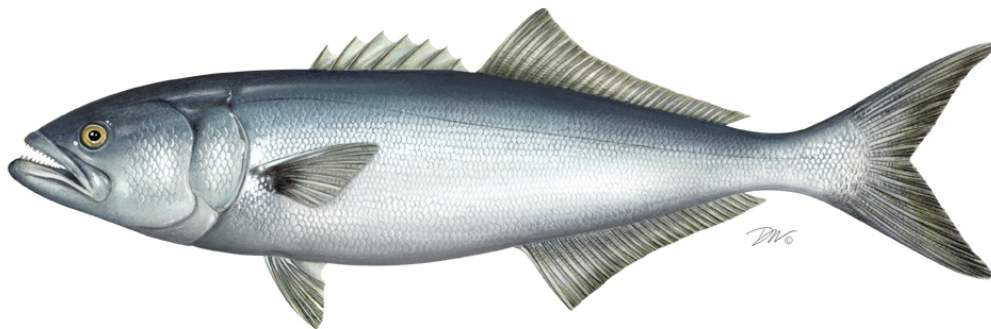
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**2019 REVIEW OF THE
ATLANTIC STATES MARINE FISHERIES COMMISSION
FISHERY MANAGEMENT PLAN FOR**

**BLUEFISH
(*Pomatomus saltatrix*)**

2018 FISHING YEAR



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Executive Summary

Bluefish from Maine through Florida are jointly managed by the Mid-Atlantic Fishery Management Council and the Atlantic States Marine Fisheries Commission under Amendment 1 and Addendum I to the interstate Fishery Management Plan.

A benchmark stock assessment was peer reviewed by the 60th Stock Assessment Review Committee in June 2015. The benchmark assessment was approved by the Management Board and Council for management use. The benchmark assessment concluded that the U.S. bluefish population is not overfished and overfishing is not occurring relative to the new biological reference points defined in the assessment. In August 2019 an updated assessment of bluefish (with data through 2018, including calibrated MRIP estimates) was reviewed. Preliminary results from that review suggest the bluefish stock was overfished and overfishing was not occurring in 2018 relative to the updated biological reference points.

2018 recreational bluefish harvest was estimated at 17.6 million fish weighing 13.47 million pounds (Table 1). Recreational dead discards were estimated at 3.10 million fish. 2018 commercial bluefish landings were estimated at 2.44 million pounds. Each sector harvested under its respective harvest limit and quota. Total removals in 2018 are the lowest in the 1985-2018 time series.

In 2018, all states implemented management programs consistent with the intent of Amendment 1 and Addendum I to the ISFMP. Maine, South Carolina and Georgia requested *de minimis* status for 2019. Maine, South Carolina, and Georgia all qualify for *de minimis* status because their commercial landings in 2018 were less than 0.1% of the coastwide commercial landings estimate.

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2019 REVIEW OF THE ASMFC FISHERY MANAGEMENT PLAN FOR BLUEFISH (*Pomatomus saltatrix*)

I. Status of the Fishery Management Plan

<u>Date of FMP Approval:</u>	1989
<u>Amendments:</u>	Amendment 1 (1998); Addendum I (2012)
<u>Management Unit:</u>	Migratory stocks of bluefish in U.S. state and federal waters of the western North Atlantic
<u>States with Declared Interest:</u>	Maine through Florida, excluding Pennsylvania and the District of Columbia
<u>Active Committees:</u>	ASMFC: Bluefish Management Board, Technical Committee, Advisory Panel, Plan Review Team, and Stock Assessment Subcommittee MAFMC: Demersal and Coastal Migratory Species Committee, Monitoring Committee, Advisory Panel, and Scientific and Statistical Committee

The Fishery Management Plan (FMP) for bluefish was adopted by the Atlantic States Marine Fisheries Commission (ASMFC or Commission) and the Mid-Atlantic Fishery Management Council (MAFMC) in October 1989. It was the first FMP developed jointly by an interstate commission and a federal fishery management council.

Bluefish is currently managed under Amendment 1 to the FMP approved in October 1998 and implemented in 2000. The goal of the Amendment is to conserve the bluefish resource along the Atlantic coast, specifically to:

1. Increase understanding of the stock and fishery
2. Provide highest availability of bluefish to U.S. fishermen while maintaining, within limits, traditional uses of bluefish
3. Provide for cooperation among the coastal states, the various regional marine fishery management councils, and federal agencies involved along the coast to enhance the management of bluefish throughout its range
4. Promote compatible management regulations between State and Federal jurisdictions
5. Prevent recruitment overfishing
6. Reduce the waste in both the commercial and recreational fisheries.

States and jurisdictions with a declared interest in the bluefish FMP include all ASMFC member states and jurisdictions, with the exception of Pennsylvania and the District of Columbia. Management issues are addressed jointly through the ASMFC Bluefish Management Board (Board) and the MAFMC Demersal and Coastal Migratory Species Committee (Council). The MAFMC's Bluefish Technical Monitoring Committee (MC) conducts annual plan monitoring,

which is reviewed jointly by the Council's and Board's Bluefish Advisory Panels (AP), and all committee recommendations are then provided to the Board and Council for review. A working group comprised of members from the Commission's Bluefish Stock Assessment Subcommittee (SAS), the Commission's Bluefish Technical Committee (TC), and the MC addresses stock assessment matters. The Board may implement changes to the FMP in state waters through the adaptive management process. The TC, Plan Review Team (PRT), Plan Development Team (PDT), and AP provide technical and industry advice to the Board throughout the adaptive management process.

In February 2012, the Board approved Addendum I to Amendment 1 to the Bluefish FMP. The Addendum establishes a coastwide biological monitoring program to improve the quantity and quality of information available for use in bluefish stock assessments. A summary of these findings from the most recent year are found in Section V.

Annual Fishery Specifications

Commercial and recreational bluefish harvests are managed via sector-specific landings limits (i.e., a coastwide commercial fishery quota and a recreational harvest limit, or RHL). The Council's Scientific and Statistical Committee (SSC) and Bluefish MC annually review the best available information and make fishery specification recommendations to the Council and Board for the subsequent fishing year. Recommendations include commercial quota, RHL, research set-aside (RSA), and other management measures such as minimum size limits and bag limits. The Council and Board meet jointly (typically in August) to consider the SSC's and MC's fishery specification recommendations and formalize commercial and recreational catch limits, and other management measures.

Annual fishery specification recommendations are typically developed as follows: final commercial quota and RHL recommendations are derived from an annual catch limit (ACL), which the FMP defines as equal to the allowable biological catch (ABC), and is in turn equal to or less than an overfishing limit (OFL). After accounting for management uncertainty, 17% of the ACL is allocated to the commercial sector and 83% to the recreational sector; these are the commercial and recreational annual catch targets (ACTs). Discard estimates are deducted from ACTs to derive commercial and recreational total allowable landings (TALs). If the recreational fishery is not projected to land its TAL (by comparison of the recreational landings estimate from the previous year), then quota may be transferred from the recreational to the commercial sector, not to exceed a commercial quota of 10.5 million pounds (the average commercial landings during the period 1990-1997). The final commercial quota is then allocated to the states of Maine through Florida based on average commercial landings during 1981-1989. The state-specific shares are detailed in Table 5.

II. Status of the Stock

The 2019 operational assessment¹ using the recalibrated MRIP estimates for recreational metrics is currently in the process of peer review. It is anticipated that the assessment will be approved by the Board and Council for management use at the joint meeting in October 2019. Preliminary results from this review suggest the Bluefish stock is overfished and overfishing was not occurring. In the interim, the 2015 benchmark stock assessment for bluefish will be referenced in this FMP review.

The 2015 benchmark stock assessment for bluefish was peer reviewed at the 60th SAW/SARC and was approved by the Board and Council for management use. The biological reference points from SARC 41 were based on maximum sustainable yield (MSY). MSY reference points require a reliable stock-recruitment relationship and the 2015 SAS determined that this relationship is poorly defined for bluefish. Therefore, for SAW 60, spawning potential ratio (SPR) reference points were used as a proxy for MSY reference points. $F_{40\%SPR}$ was selected at SAW 60 as the F_{MSY} proxy for the overfishing threshold. This threshold was modified by the SSC to $F_{35\%SPR}$, noting that $F_{40\%SPR}$ might be inappropriate for bluefish, a highly productive species. The biomass target (SSB_{MSY} proxy) was established by projecting the population forward until an equilibrium spawning stock biomass was reached (NEFSC 2015).

The results of the 2015 benchmark assessment indicate that bluefish are not overfished and overfishing is not occurring. Spawning stock biomass (SSB) in 2014 was estimated at 191 million pounds which is below the SSB target (223 million pounds) but above the SSB threshold (112 million pounds). Although variable across the time series, recruitment (age-0 fish) has increased from 16.74 million fish in 2012 to 29.61 million fish in 2014. Fishing mortality (F) in 2014 was estimated to be 0.16 which is below the F threshold ($F_{35\%SPR}=0.19$).

III. Status of the Fishery

From 1985-2018, recreational catch (harvest plus fish caught and released) of bluefish in U.S. waters of the Atlantic coast averaged 44.96 million fish annually (Table 1 and Figure 1). In 2018, recreational catch was estimated at 38.3 million fish which is a 27% decrease relative to 2017. In 2018, recreational anglers harvested an estimated 17.6 million fish weighing 13.47 million pounds (6,111 metric tons). This represents a decrease relative to 2017 harvest in terms of number of fish (26%) and an even larger decrease by weight (59%), indicating that bluefish harvested recreationally in 2018 were considerably smaller than those harvested in 2017. The majority of the recreational harvest (number of fish) came from North Carolina (32%), Florida (20%), New Jersey (14%) and New York (12%). In 2018, recreational dead discards (15% of B2) were estimated at 3.10 million fish (Table 1).

¹ An operational assessment uses an existing model with limited changes, but adds new data to existing data sources. These assessments provide stock status, and involve an integrated peer review with select fishery council science committee members. This type of assessment is intermediate between an update assessment and a benchmark assessment (Source: <https://www.nefsc.noaa.gov/groundfish/operational-assessments-2017/>).

From 1985-1999, annual commercial landings of bluefish in U.S. waters of the Atlantic coast averaged 11.61 million pounds (5,268 metric tons). After the implementation of the Amendment 1 quota system, from 2000-2018 commercial landings of bluefish have averaged 6.11 million pounds (2,773 metric tons) annually (Figure 2). In 2018, commercial landings were estimated at 2.44 million pounds (1,107 metric tons), a decrease of 41% relative to 2017 landings and a 68% underage of the 2018 commercial quota (7.71 million pounds). The majority of commercial landings came from North Carolina (38%), New York (22%), and Florida (13%). Commercial dead discards are considered negligible.

V. Status of Research and Monitoring

Many states, the National Marine Fisheries Service (NMFS), the Northeast Area Monitoring and Assessment Program (NEAMAP), and the Southeast Area Monitoring and Assessment Program (SEAMAP) conduct fishery-independent surveys. New Hampshire, Rhode Island, Connecticut, New York, New Jersey, Maryland, Virginia, and South Carolina (SEAMAP) provide indices of juvenile bluefish abundance for stock assessment, and Connecticut, New Jersey, Virginia (NEAMAP), and North Carolina provide indices of adult abundance. Year class strength is monitored through a number of fishery-independent surveys (NEFSC 2015). Although not included in the 2015 benchmark assessment (NEFSC 2015), Massachusetts, Delaware, Georgia and Florida also maintain indices of abundance from surveys that encounter bluefish. Refer to Table 3 for status of monitoring efforts by state in 2018.

Commercial landings information is collected by most states from dealer or fisherman reporting programs, which is provided to the Atlantic Coastal Cooperative Statistics Program's (ACCSP) Standard Atlantic Fisheries Information System (SAFIS). Fishermen fishing in federal waters are required to report their landings to NMFS. North Carolina and Virginia are the only states that significantly sample bluefish commercial fisheries for size and age composition of the catch. Recreational catch and harvest is monitored by the Marine Recreational Information Program (MRIP).

Addendum I to Amendment 1 (2012) implemented a biological monitoring program to enhance age and length data used in bluefish stock assessments. Under Addendum I, states that accounted for more than 5% of total coastwide bluefish harvest (recreational and commercial combined) for the 1998-2008 period are required to collect a minimum of 100 bluefish ages (50 from January through June, 50 from July through December). Those states are Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Virginia, and North Carolina. Age samples are primarily collected from fishery-dependent sources (e.g., party/charter boats, fishing tournaments and volunteer anglers), although samples collected from fishery-independent sources are sometimes utilized as needed to fulfill this requirement. In 2018, most of these states were able to collect the minimum of 100 age samples (Table 3), and all states made a good effort to collect 50 age samples from both spring and fall. Massachusetts collected just 98 samples, just under the 100 sample requirement. South Carolina also reported 100 age samples collected by personnel of the SEAMAP-SA coastal trawl survey, and 21 from the South Carolina Inshore Finfish Monitoring program.

As prescribed in the addendum, following the end of the first year of the sampling program, the TC reviewed the sampling design and evaluated the optimal geographic range and sample size for bluefish age data. The TC found the sampling program design to be satisfactory. However, additional TC reviews may be warranted as the program continues, especially in light of the difficulties expressed by some states to collect samples before July.

VI. Status of Management Measures and Issues

The Board and Council recommend adjustments to the commercial quota and RHL annually using the specification setting process detailed in Amendment 1 (Section 3.1.1.6) and in Section I of this report. The recreational fishery is allocated 83% of the ACL, and 17% is allocated to the commercial fishery. The coastwide commercial quota is allocated to the states via state-specific percentage shares based on landings from 1981-1989.

The 2018 ACL was 21.81 million pounds (9,895 metric tons); after a transfer of 3.54 million pounds from the recreational to commercial sector, the commercial quota was 7.24 million pounds (3,286 metric tons) and the RHL was 11.58 million pounds (5,253 metric tons). In 2018, neither sector exceeded their respective quota or harvest limit, therefore no federal accountability measures have been triggered for 2019. 2018 state-specific shares and landings, and initial 2019 state-specific shares are listed in Table 5.

The MAFMC and ASMFC have initiated an amendment process that will involve a comprehensive review of the Bluefish Fishery management Plan's sector-based allocations, commercial allocations to the states, transfer processes, as well as FMP goals and objectives, and any other issues highlighted by the Council and Commission through the scoping process.

VII. Current State-by-State Implementation of FMP Compliance Requirements

These states and jurisdictions are required to comply with the provisions of the Bluefish FMP: Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Delaware, Maryland, Potomac River Fisheries Commission, Virginia, North Carolina, South Carolina, Georgia, and Florida. The following are specific FMP compliance requirements:

- Each state must restrict the possession of bluefish by recreational anglers to no more than fifteen fish per day, or have an ASMFC-approved equivalent conservation program.
- Each state must restrict its commercial fishery to the quota adopted under procedures specified in the FMP.
- These states are required to collect a minimum of 100 age samples per Addendum I to Amendment 1: Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Virginia, and North Carolina.
- States must submit annual compliance reports verifying that the above listed FMP requirements have been implemented. Compliance reports should also include an overview

of permitting requirements for commercial and party/charter vessels and commercial dealers.

Based on the annual state compliance reports, the PRT determined all states and jurisdictions implemented a management program in 2018 consistent with the intent of the ISFMP for Bluefish (Amendment 1 and Addendum I). All states implemented a recreational possession limit not exceeding 15 fish per person and were able to collect all or nearly all of the 100 required biological samples. Refer to Table 3 for state monitoring and reporting requirements, Table 4 for fishery regulations by state in 2018, and Table 5 for commercial quota monitoring and harvest.

Maine, South Carolina, and Georgia requested *de minimis* status for 2018. Maine, South Carolina, and Georgia qualify for *de minimis* status because their commercial landings from the most recent year were less than 0.1% of the coastwide commercial landings estimate (Table 5).

VIII. Prioritized Research Needs

The following research recommendations were identified at the 60th SAW/SARC:

High Priority

1. Determine whether NC scale data from 1985-1995 are available for age determination; if available, re-age based on protocols outlined in ASMFC (2001); if re-aging results in changes to age assignments, quantify the effects of scale data on the assessment.
2. Develop additional adult bluefish indices of abundance (e.g., broad spatial scale longline survey or gillnet survey).
3. Expand age structure of SEAMAP index.

Moderate Priority

4. Investigate species associations with recreational angler trips targeting bluefish (on a regional and seasonal basis) to potentially modify the MRIP index used in the assessment model.
5. Explore age- and time-varying natural mortality from, for example, predator-prey relationships; quantify effects of age- and time-varying mortality on the assessment model.
6. Continue to evaluate the spatial, temporal, and sector-specific trends in bluefish growth and quantify their effects in the assessment model.
7. Continue to examine alternative models that take advantage of length-based assessment frameworks. Evaluate the source of bimodal length frequency in the catch (e.g., migration, differential growth rates – also multiple cohorts as noted by the PRT).
8. Modify thermal niche model to incorporate water temperature data more appropriate for bluefish in a timelier manner [e.g., sea surface temperature data & temperature data that cover the full range of bluefish habitat (SAB and estuaries)].

IX. Plan Review Team Comments and Recommendations

- The PRT found that all states implemented regulations consistent with the intent of Amendment 1 and Addendum I of the Bluefish Interstate FMP.
- Maine, South Carolina and Georgia requested and meet the requirements for *de minimis* status for 2018.
- The TC should periodically review the effectiveness of the Addendum I sampling design and evaluate the optimal geographic range and sample size for bluefish age data.
- The PRT notes that the MAFMC and ASMFC have initiated an amendment process that will involve a comprehensive review of the Bluefish Fishery Management Plan's sector-based allocations, commercial allocations to the states, transfer processes, as well as FMP goals and objectives, and any other issues highlighted by the Council and Commission through the scoping process.
- Preliminary results from an August 2019 operational assessment of bluefish (with data through 2018, including calibrated MRIP estimates) suggest the bluefish stock was overfished and overfishing was not occurring in 2018 relative to updated biological reference points.
- The PRT recommends that the TC look into the increased importance of recreational discards in stock assessments. Generating reliable discard length data from recreational anglers could improve the robustness of stock assessments moving forward.

X. References

Mid-Atlantic Fishery Management Council (MAFMC) and Atlantic States Marine Fisheries Commission (ASMFC). 1998. Amendment 1 to the Bluefish Fishery Management Plan.

Northeast Fisheries Science Center. 2015. 60th Northeast Regional Stock Assessment Workshop (60th SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 15-07; 36 p. doi: 10.7289/V5D21VKV

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XI. Tables

Table 1. Estimated bluefish recreational harvest (A + B1), releases (B2), dead discards (DD; 15% of B2), total catch (A+B1+B2), and total removals (Harvest+DDs) in numbers of fish by marine recreational anglers, 2008 to 2018. Source: MRIP. These estimates may differ from MRIP estimates depending on query date (Data queried August 6, 2019).

Year	Total Catch (A+B1+B2)	Harvest (A+B1)	Released (B2)	DDs (15% of B2)	Total Removals (Harvest + DD)
2008	46,045,004	14,845,435	31,199,569	4,679,935	19,525,370
2009	49,866,588	18,085,386	31,781,202	4,767,180	22,852,566
2010	62,350,107	21,929,516	40,420,591	6,063,089	27,992,605
2011	58,290,652	20,814,885	37,475,767	5,621,365	26,436,250
2012	50,658,368	18,578,840	32,079,528	4,811,929	23,390,769
2013	53,494,663	19,975,050	33,519,613	5,027,942	25,002,992
2014	55,093,765	21,510,651	33,583,114	5,037,467	26,548,118
2015	42,148,962	13,725,106	28,423,856	4,263,578	17,988,684
2016	42,528,745	14,899,722	27,629,023	4,144,353	19,044,075
2017	52,258,920	23,941,161	28,317,759	4,247,664	28,188,824
2018	38,283,848	17,600,856	20,682,992	3,102,449	20,703,305
Average	44,965,432	20,762,764	24,202,668	3,630,400	24,393,164

Table 2. Bluefish Commercial Landings and Recreational Harvest (A + B1) by weight (metric tons, pounds), 2008-2018. Source: SAFIS and MRIP. Estimates may differ from source websites depending on query date (2018 commercial data queried August 6, 2019; recreational data queried August 6, 2019).

Year	Commercial		Recreational (A + B1)		Total	
	MT	Pounds	MT	Pounds	MT	Pounds
2008	2,734	6,027,113	16,669	36,747,825	19,403	42,774,938
2009	3,137	6,915,525	18,836	41,526,898	21,973	48,442,423
2010	3,310	7,298,147	21,280	46,914,747	24,591	54,212,894
2011	2,458	5,418,960	15,714	34,643,119	18,172	40,062,079
2012	2,220	4,893,437	14,919	32,891,473	17,139	37,784,910
2013	1,994	4,396,929	15,860	34,964,726	17,854	39,361,655
2014	2,280	5,026,123	12,631	27,846,802	14,911	32,872,925
2015	1,922	4,237,385	13,757	30,328,486	15,679	34,565,871
2016	1,930	4,253,923	11,183	24,654,287	13,113	28,908,210
2017	1,880	4,145,055	14,736	32,486,216	16,616	36,631,271
2018	1,107	2,440,289	6,111	13,473,096	7,218	15,913,385
Average	2,270	5,004,808	14,700	32,407,061	16,970	37,411,869

Table 3. Status of compliance with monitoring and reporting requirements, 2018 (Y = compliance standards met, N = compliance standards not met, NA = not applicable).

State/ Jurisdiction	Fishery-independent monitoring		Fishery-dependent monitoring		Annual Reporting Status
	Survey(s)	Status	Type(s)	Status (num. of age samples)	
ME*	NA	NA	Rec and Com harvest	NA	Y
NH	Juvenile	Y	Rec and Com harvest	NA	Y
MA	Juvenile	Y	Rec and Com harvest, Age Samples	Y (98)	Y
RI	Juvenile, Adult	Y	Rec and Com harvest, Age Samples	Y (105)	Y
CT	Juvenile, Adult	Y	Rec and Com harvest, Age Samples	Y (190)	Y
NY	Juvenile	Y	Rec and Com harvest, Age Samples	Y (155)	Y
NJ	Juvenile, Adult	Y	Rec and Com harvest, Age Samples	Y (223)	Y
DE	Juvenile, Adult	Y	Rec and Com harvest	NA	Y
MD	Juvenile	Y	Rec and Com harvest	NA	Y
PRFC	Juvenile	Y	Rec and Com harvest	NA	Y
VA	Juvenile, Adult	Y	Rec and Com harvest, Age Samples	Y (390)	Y
NC	Adult	Y	Rec and Com harvest, Age Samples	Y (732)	Y
SC*	NA	NA	Rec and Com harvest	NA	Y
GA*	NA	NA	Rec and Com harvest	NA	Y
FL	Juvenile, Adult	Y	Rec and Com harvest	NA	Y

*granted *de minimis* for 2018 fishing season

Table 4. Fishery regulations by state, 2018. Minimum size are in total length (TL) except for GA and FL are in fork length (FL).

State/ Jurisdiction	Recreational			Commercial	
	Bag Limit	Season	Size Limit	Trip and Size Limit	Open Season
ME	3 fish	All year	None	No Restrictions	All year
NH	10 fish	All year	None	No Restrictions	July 1 - Sept 30
MA	10 fish	All year	None	5,000 lbs/day or trip (whichever is longer)	All year
RI	15 fish	All year	None	12" min size; 1,000 lbs/bi-wk (1.1-4.30) 8,000 lbs/wk (5.1-11.10) 500 lbs/wk (11.11-12.31)	All year
CT	10 fish	All year	None	9" min size; 1,200 lbs/trip	All year
NY	15 fish	All year	Only 10 fish <12"	9" min size; Trip Limit: 2,000 lbs (Jan- April); 500 lbs (May-Aug); 1,000 lbs (Sept-Dec)	All year
NJ	15 fish	All year	None	9" min size	Closed to H&L from 1.1-6.15 and 8.8-12.31
DE	10 fish	All year	None	No Restrictions	All year
MD	10 fish	All year	8" min size	8" min size	All year
PRFC	10 fish	All year	8" min size	Trip limits after 80% of VA- MD quota is landed	All year
VA	10 fish	All year	None	No Restrictions	All year
NC	15 fish	All year	Only 5 fish > 24"	No Restrictions	All year
SC	15 fish	All year	None	No directed fishery	All year
GA	15 fish	All year	12" min size	12" min size; 15 fish	All Year
FL	10 fish	All year	12" min size	12" min size; 7,500 lbs/day	All year

Table 5. 2018 state-specific shares of commercial bluefish quota and estimated harvest by weight (lbs). Landings data source: SAFIS (query date: June 6, 2019). C = landings values are confidential.

State	% of Federal Quota	2018 Initial Quota*	2018 Transfers	2018 Final Quota	2018 Landings	Overages	% Quota Used	% Coastwide Total	2019 Initial Quota
ME	0.6685	48,424		48,424	29.87	0	0.1%	0.0%	51,538
NH	0.4145	30,025		30,025	C	C	C	C	31,956
MA	6.7167	486,539		486,539	195,378	0	40.2%	8.1%	517,828
RI	6.8081	493,160		493,160	237,099	0	48.1%	9.8%	524,874
CT	1.2663	91,727		91,727	53,367	0	58.2%	2.2%	97,626
NY	10.3851	752,268		752,268	537,035	0	71.4%	22.0%	800,645
NJ	14.8162	1,073,245		1,073,245	56,206	0	5.2%	2.3%	1,142,264
DE	1.8782	136,052		136,052	667	0	0.5%	0.0%	144,801
MD	3.0018	217,442		217,442	25,717	0	11.8%	1.1%	231,426
VA	11.8795	860,518		860,518	93,070	0	10.8%	3.8%	915,857
NC	32.0608	2,322,397		2,322,397	910,202	0	39.2%	37.6%	2,471,746
SC	0.0352	2,550		2,550	C	C	C	C	2,714
GA	0.0095	688		688	C	C	C	C	732
FL	10.0597	728,697		728,697	316,193	0	43.4%	13.1%	775,558
TOTAL[^]	100.00	8,542,230	0	7,243,726	2,420,934	0	33%		7,709,565

[^] totals in table may not match listed quotas due to rounding

XII. Figures

Figure 1. Estimated recreational bluefish harvest (A + B1), releases (B2) and dead discards by recreational anglers in numbers of fish, 1985-2018. Note: Harvest and dead discards are additive. Source: MRIP. Estimates may differ from source websites depending on query date (2018 data queried August 6, 2019).

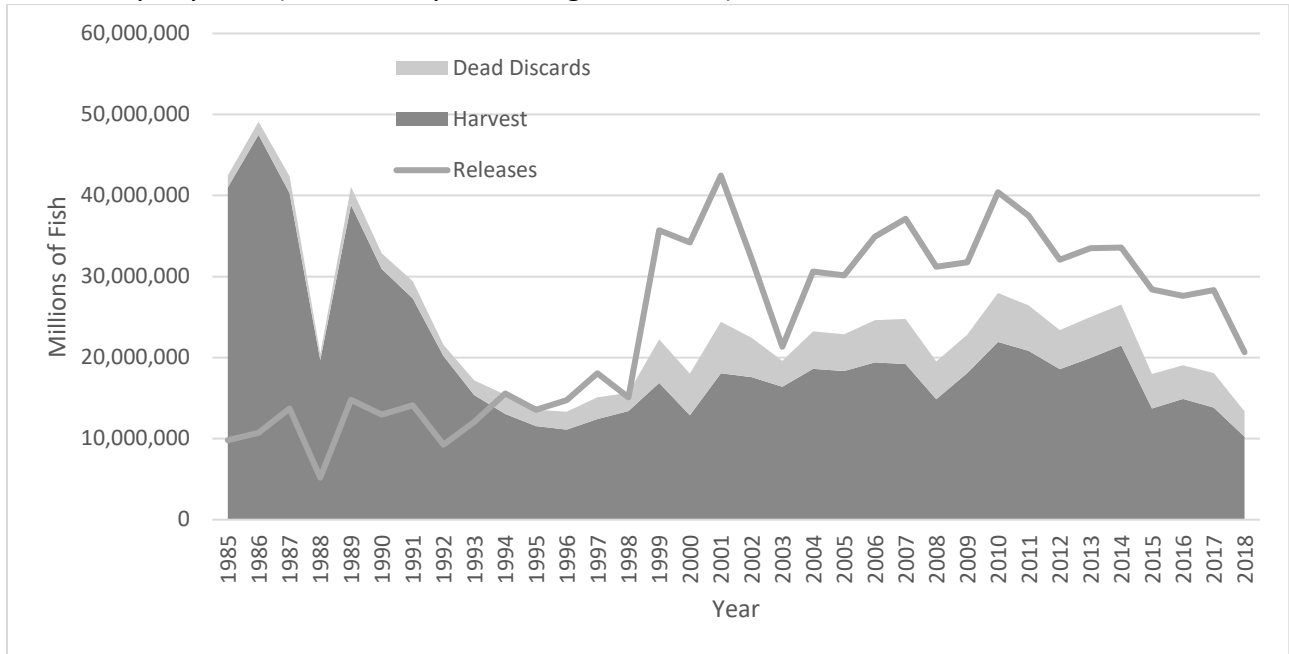


Figure 2. Bluefish recreational harvest and commercial landings estimates by weight, 1985-2018. Source: SAFIS and MRIP. Estimates may differ from source websites depending on query date (2018 data queried August 6, 2019).

