Mid-Atlantic Fishery Management Council<br>800 North State Street, Suite 201, Dover, DE 19901

## MEMORANDUM

Date: $\quad$ November 22, 2019
To: $\quad$ Council and Board
From: Matthew Seeley, Council staff
Subject: 2020-2021 Bluefish Recreational Specifications

The Council and Board will consider 2020-2021 recreational specifications for bluefish on Tuesday, December 10, 2019. Materials listed below are provided for the Council and Board’s consideration of this agenda item.

1) Advisory panel meeting summary dated November 19, 2019
2) Monitoring Committee recreational measures recommendation summary dated November 14, 2019
3) Staff memo on 2020-2021 bluefish recreational management measures dated November 1, 2019
4) Supplemental bluefish public comment dated November 27, 2019


## Bluefish Advisory Panel Summary November 19, 2019

Advisory Panel members present: Vince Cannuli (MD), Victor Hartley III (NJ), Arnold Leo (NY), Michael Pirri (CT), Peter Moore (CT), and Tom Roller (NC).

Others present: Dustin Colson Leaning (ASMFC Staff), Greg DiDomenico (GSSA), Paul Caruso, Rusty Hudson (FL), Steve Cannizzo (NY), Cynthia Ferrio (GARO), Hannah Hart (FL FWC), Michael Toole, Olivia Phillips, Steven Witthuhn (NY), TJ Karbowski, and Matt Seeley (MAFMC Staff).

## Introduction

The Mid-Atlantic Fishery Management Council’s Bluefish Advisory Panel (AP) met jointly with the Atlantic States Marine Fisheries Commission’s Bluefish Advisory Panel on Tuesday, November 19, 2019 from 10:00 a.m. until 12:00 p.m. The purpose of this meeting was to offer the APs an opportunity to provide comments and recommendations on recreational management measures for bluefish for the 2020 fishing year developed by the Monitoring Committee (MC) at their November $14^{\text {th }}$ meeting.

Council staff provided a presentation with background information including the management overview, updated stock status and data update, a recap of recent recreational fishery performance, and the recommendations from the MC. Then, discussion commenced with comments on and suggestions for the recreational management measures to constrain harvest to the recreational harvest limit.

The AP began discussion by emphasizing their dissatisfaction with the Marine Recreational Information Program estimates. Most AP members and the public do not believe the estimates and feel they are driving unnecessary changes in regulations despite observing only slight changes on the water. Many of these on the water observations relate to the availability of bait fish. If bait is present and abundant, bluefish are present and abundant. If bait is unavailable, bluefish do not appear in coastal waters at the same general time each year. AP members would like to see more information related to bait species presence-absence in order to correlate bluefish presence-absence. This bait "issue", as referred to by AP members, is only an issue in certain states. However, AP members from NY, NJ, and NC all mentioned that bait is not the primary issue in their states.

## Comments on the Monitoring Committee Recommendations

Almost all AP members and public that participated in the meeting were speaking in terms of the for-hire sector and stated that the proposed four alternatives will not work for their needs. They
understand that the reduction in harvest is necessary but cannot successfully work with the proposed alternatives. Stakeholders invested in the for-hire sector adamantly stated that these measures will put them out of business as there will be little to no incentive for their clients to pay for a fishing trip where they cannot harvest more than three bluefish. Additionally, AP members and the public emphasized that these proposed regulations come at a very poor time for for-hire stakeholders. On top of these bluefish measures, for-hire stakeholders are also dealing with large restrictions on striped bass, black sea bass, summer flounder, and scup.

For many of the for-hire stakeholders, bluefish is not their primary target species. These captains and anglers often treat bluefish as a reliable fallback species when the main target species (striped bass, summer flounder, etc.) are either not available or the restrictions dictate what can be harvested.

While the AP and public recognize the need for a coastwide reduction in harvest, they do not believe it needs to be as harsh as shifting from 15 fish to a 3 fish bag limit with no size restriction, or a 4 fish bag limit with 17 inch size restriction (or a 5 fish - 19 inch, or a 6 fish - 21 inch). Instead, many AP members and public offered their recommendations. To have coastwide measures that appease the for-hire and private/shore sectors, discussion revolved around an 8-10 fish bag limit with a 12-14" minimum size. An advisor from NC indicated the strictest regulations that could be supported would be a 5 fish bag limit, but with hesitation on a size limit because many people harvest snapper bluefish for consumption and bait. Furthermore, an AP member indicated that imposing a size limit will increase the number of dead discards because anglers will have to handle the fish more than under the current regulations due to the need to be measured.

Few comments directly addressed the coastwide 3-fish bag limit. The AP and public's main concern was that the proposed regulations are too drastic of a reduction, especially during a time where many other species are experiencing similar regulations. The AP and public would prefer a higher coastwide bag limit for 2020 and potentially a lower limit for 2021 to spread out the impacts of the reductions over a longer time period. Overall, there was consensus that the coastwide 15 fish bag limit is not necessary (when not considering the for-hire sector).

The AP and public discussed the ability to impose a seasonal closure and agreed with the MC recommendation. Any sort of seasonal closure will not be fair and equitable coastwide to individual states and will have larger detrimental effects than any other proposed measure.


Bluefish Monitoring Committee
Meeting Summary
November 14, 2019
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), John Maniscalco (NY DEC), Greg Wojcik (for Kurt Gottschall) (CT Bureau MF), Amy Zimney (SCDNR), Lee Paramore (NCDENR), Joseph Munyandorero (FL FWC) and Sam Truesdell (MA DMF).

Others in attendance: José Montañez (Council Staff), Kiley Dancy (Council Staff), Karson Coutre (Council Staff), Mark Terceiro (NEFSC), Nichola Meserve (MA), Maureen Davidson (NY DEC), Olivia Phillips, and Alex Aspinwall (VMRC).

## Introduction

The Council and Board approved a Recreational Harvest Limit (RHL) of 9.48 million pounds and expected recreational landings value of 13.27 million pounds (2018 recreational landings) at the October joint meeting. Thus, the Monitoring Committee (MC) was tasked with developing recreational measures to constrain recreational harvest by $28.56 \%$ to prevent exceeding the RHL in 2019. At the Bluefish MC meeting, staff presented a summary of recent recreational fishery performance, the specifications process, and a summary of the analyses conducted to constrain 2020 recreational harvest to the RHL. The MC explored seasonal closures, bag limits, size limits, and various combinations to constrain harvest. The MC also looked at mode specific measures to address potential socio-economic impacts on particular sectors of the recreational fishery.

The MC recognizes that the recommendations presented at the end of this document are not ideal for all stakeholders, so four alternatives are presented with different recreational measures available for specific fishing modes.

## Seasonal Closures

The MC explored a variety of alternatives to constrain recreational harvest using seasonal closures by wave. Although closing one wave, or a combination of waves, would achieve the necessary reduction in recreational harvest, the MC recommended no seasonal closure.

According to the Bluefish Fishery Management Plan, imposed regulations need to offer fair and equitable access to the resource for all states. The MC concluded there were no equitable approaches to be taken through seasonal closures, whether imposed as the only method to constrain harvest or in combination with another measure (Table 1). This is due to the migratory
nature of bluefish that make them available to different states at different times of the year. For example, Florida harvested more pounds than any other state in 2018. Of those landings, 46.45\% were harvested in wave 1 when no other state harvested bluefish. Therefore, a closure of wave 1 only affects one state when attempting to reduce harvest coastwide.

## Bag Limits

The MC discussed how including discards and fishing mode all affect potential bag limit alternatives. For discards, the MC recommended not including estimated discards into the bag limit analysis because the MC is tasked to constrain harvest to the RHL, which already accounts for discards earlier in the specifications process when the annual catch target is reduced to the total allowable landings. For fishing mode, the MC recommended identifying if the necessary reduction in harvest could be achieved with different measures for the for-hire sector compared to shore and private anglers. The MC decided to explore different measures for each mode because particular measures are expected to affect the modes differently. The for-hire industry, which is responsible for less than $5 \%$ of overall harvest (2018), would be largely impacted by a decreased bag limit as their business thrives off clients being able to harvest more fish. If the bag limit is increased for one sector, these measures need to be combined with other RHL constraining measures, such as a minimum size limit, to make sure each mode meets the necessary reduction (see below for the Combination of Measures).

The current federal bag limit is 15 fish. Reducing the bag limit to 3 fish coastwide for all modes will result in decreased harvest by the necessary $28.56 \%$ (Table 2). However, in addition to the impacts stated above a decreased bag limit may lead to increased discards through incidental encounters while targeting other species. Alternatively, the increased discards may be offset by decreased effort as many anglers may not target bluefish because as advisors indicated, the 15 fish limit is great incentive for anglers to want to target bluefish.

## Size Limits

The MC discussed different approaches from the initial staff memo on how to analyze the size limit data. The MC first recommended that the length data be binned to a finer scale to ultimately allow for a conversion from fork length bins in inches to total length bins in inches because size limits are set for other managed species using total length. Also, like the bag limit measures, the MC recommended analyzing the size limit data by mode to explore sector specific measures (Table 3).

When discussing size limit alternatives a few MC members indicated that the private and shore modes would be heavily impacted by a minimum size limit as this would eliminate the "snapper" (age 0 ) and bait fisheries. These two fisheries occur coastwide but are prevalent in waters off Connecticut (snapper) and North Carolina (bait). The snapper and bait fishery are not large but would experience the greatest reduction if a size limit is approved.

## Combination of Measures

The MC explored different combinations of management measures to help constrain harvest to the RHL coastwide and by mode (excluding season). But no recommendations were made including combinations of measures to constrain harvest to the RHL for shore and private/rental fishermen. This was because any bag limit over 3 fish would warrant a size limit (greater than 14 inches) that is too large and not adequate for certain recreational stakeholders to even desire to target bluefish.

When considering the for-hire sector, which represented <5\% of overall landings in 2018, the MC explored a bag and size limits. The goal was to allow the for-hire sector to keep more fish (incentive for their clients), but at a size limit they frequently catch. Results for the reduction associated with 3-6 fish bag limits and the associated size limits are presented in Table 4.

## Monitoring Committee Recommendation

The Council approved expected recreational landings of $13,270,862$ pounds is $28.56 \%$ higher than the 2020 RHL of $9,480,162$ pounds. Thus, the MC recommends a coastwide 3 -fish bag limit to constrain harvest by $28.78 \%$ so that the 2020 recreational harvest does not exceed the RHL.

In consideration of the potential socio-economic impacts of a 3-fish bag limit, the MC offered 3 alternatives that constrain harvest by the necessary $28.56 \%$ to allow the for-hire sector to land more than 3 fish with associated size limits (Table 4).

Table 1. 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 2. Associated percent reduction in harvest (pounds) using bluefish bag limits from 2016-2018 for (A) all modes combined (coastwide), (B) shore and private rental (relative to sector harvest), and (C) for-hire (relative to sector harvest).

| A | All Modes |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Bag Limit | $\mathbf{2 0 1 8}$ | $\mathbf{2 0 1 7}$ | $\mathbf{2 0 1 6}$ | Average |
| 1 | $-62.27 \%$ | $-56.19 \%$ | $-61.80 \%$ | $\mathbf{- 6 0 . 0 9 \%}$ |  |
| 2 | $-43.36 \%$ | $-38.02 \%$ | $-43.47 \%$ | $\mathbf{- 4 1 . 6 1 \%}$ |  |
| 3 | $-29.89 \%$ | $-26.30 \%$ | $-30.15 \%$ | $\mathbf{- 2 8 . 7 8 \%}$ |  |
| 4 | $-20.58 \%$ | $-18.69 \%$ | $-21.20 \%$ | $\mathbf{- 2 0 . 1 6 \%}$ |  |
| 5 | $-15.29 \%$ | $-13.11 \%$ | $-14.56 \%$ | $\mathbf{- 1 4 . 3 2 \%}$ |  |
| 6 | $-11.18 \%$ | $-9.34 \%$ | $-10.02 \%$ | $\mathbf{- 1 0 . 1 8 \%}$ |  |
| 7 | $-8.23 \%$ | $-6.50 \%$ | $-7.47 \%$ | $\mathbf{- 7 . 4 0 \%}$ |  |
| 8 | $-5.69 \%$ | $-4.71 \%$ | $-5.67 \%$ | $\mathbf{- 5 . 3 6 \%}$ |  |
| 9 | $-4.01 \%$ | $-3.19 \%$ | $-4.27 \%$ | $\mathbf{- 3 . 8 2 \%}$ |  |
| 10 | $-2.50 \%$ | $-2.03 \%$ | $-2.96 \%$ | $\mathbf{- 2 . 5 0 \%}$ |  |


| B | Shore and Private Rental |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Bag Limit | $\mathbf{2 0 1 8}$ | $\mathbf{2 0 1 7}$ | $\mathbf{2 0 1 6}$ | Average |
|  | $-62.38 \%$ | $-56.87 \%$ | $-62.01 \%$ | $\mathbf{- 6 0 . 4 2 \%}$ |  |
|  | $-43.42 \%$ | $-38.87 \%$ | $-43.65 \%$ | $\mathbf{- 4 1 . 9 8 \%}$ |  |
|  | $-29.91 \%$ | $-27.22 \%$ | $-30.28 \%$ | $\mathbf{- 2 9 . 1 4 \%}$ |  |
|  | $-20.56 \%$ | $-19.66 \%$ | $-21.32 \%$ | $\mathbf{- 2 0 . 5 1 \%}$ |  |
| 5 | $-15.27 \%$ | $-14.10 \%$ | $-14.63 \%$ | $\mathbf{- 1 4 . 6 7 \%}$ |  |
| 6 | $-11.15 \%$ | $-10.36 \%$ | $-10.07 \%$ | $\mathbf{- 1 0 . 5 3 \%}$ |  |
| 7 | $-8.19 \%$ | $-7.55 \%$ | $-7.52 \%$ | $\mathbf{- 7 . 7 5 \%}$ |  |
| 8 | $-5.67 \%$ | $-5.77 \%$ | $-5.73 \%$ | $\mathbf{- 5 . 7 2 \%}$ |  |
| 9 | $-3.98 \%$ | $-4.27 \%$ | $-4.34 \%$ | $\mathbf{- 4 . 2 0 \%}$ |  |
| 10 | $-2.46 \%$ | $-3.12 \%$ | $-3.04 \%$ | $\mathbf{- 2 . 8 7 \%}$ |  |


| C | For-Hire |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Bag Limit | 2018 | 2017 | 2016 | Average |
|  | 1 | -50.86\% | -44.65\% | -54.88\% | -50.13\% |
|  | 2 | -39.81\% | -28.66\% | -37.95\% | -35.47\% |
|  | 3 | -28.75\% | -19.89\% | -27.17\% | -25.27\% |
|  | 4 | -21.56\% | -13.67\% | -19.36\% | -18.20\% |
|  | 5 | -16.62\% | -10.08\% | -14.64\% | -13.78\% |
|  | 6 | -12.91\% | -7.13\% | -11.40\% | -10.48\% |
|  | 7 | -9.87\% | -4.69\% | -8.70\% | -7.76\% |
|  | 8 | -7.14\% | -2.81\% | -6.60\% | -5.51\% |
|  | 9 | -5.48\% | -1.60\% | -4.79\% | -3.96\% |
|  | 10 | -4.20\% | -0.72\% | -3.17\% | -2.70\% |

Tables 3. Associated percent reduction in harvest (pounds) using bluefish size limits from 2016-2018 for (A) all modes combined, (B) shore and private rental, and (C) for-hire.


Table 3 Continued. Associated percent reduction in harvest using coastwide bluefish size limits from 2016-2018 for (A) all modes combined, (B) shore and private rental, and (C) for-hire.

| C | For-Hire - Size Limits |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | TL (in) | Pounds | Numbers | Landings (pounds) | \% of total landings | $\begin{gathered} \text { Cumulative } \\ \% \end{gathered}$ | $\begin{gathered} \text { Reduction } \\ \% \\ \hline \end{gathered}$ |
|  | 4 | 0.02 | 7.72 | 0.19 | 0.00\% | 0.00\% | 0.00\% |
|  | - | - | - | - | - | - | - |
|  | 6 | 0.08 | 416.30 | 34.05 | 0.00\% | 0.00\% | 0.00\% |
|  | 7 | 0.13 | 1,116.73 | 143.04 | 0.01\% | 0.01\% | 0.00\% |
|  | 8 | 0.19 | 3,281.28 | 619.22 | 0.02\% | 0.03\% | 0.01\% |
|  | 9 | 0.27 | 12,294.34 | 3,263.37 | 0.13\% | 0.16\% | 0.03\% |
|  | 10 | 0.36 | 27,768.43 | 9,996.44 | 0.40\% | 0.56\% | 0.16\% |
|  | 11 | 0.47 | 49,346.34 | 23,394.31 | 0.93\% | 1.48\% | 0.56\% |
|  | 12 | 0.61 | 73,742.09 | 44,937.64 | 1.78\% | 3.26\% | 1.48\% |
|  | 13 | 0.77 | 57,681.81 | 44,274.57 | 1.75\% | 5.02\% | 3.26\% |
|  | 14 | 0.95 | 71,267.48 | 67,721.90 | 2.68\% | 7.70\% | 5.02\% |
|  | 15 | 1.16 | 66,469.74 | 77,042.43 | 3.05\% | 10.75\% | 7.70\% |
|  | 16 | 1.40 | 35,888.48 | 50,085.91 | 1.98\% | 12.73\% | 10.75\% |
|  | 17 | 1.66 | 34,014.45 | 56,513.31 | 2.24\% | 14.97\% | 12.73\% |
|  | 18 | 1.96 | 30,830.83 | 60,372.54 | 2.39\% | 17.36\% | 14.97\% |
|  | 19 | 2.29 | 20,081.71 | 45,934.26 | 1.82\% | 19.18\% | 17.36\% |
|  | 20 | 2.65 | 25,224.72 | 66,859.07 | 2.65\% | 21.83\% | 19.18\% |

Table 4. Alternatives to constrain coastwide harvest with associated percent reductions in harvest using coastwide bluefish bag and size limits from 2016-2018.

| Alternative | Mode | Bag Limit | Size (inches) | Reduction by Mode |
| :---: | :---: | :---: | :---: | :---: |
| $\mathbf{1}$ | All Modes | 3 | 0 | $28.78 \%$ |
|  | For-Hire | 4 | 17 | $28.61 \%$ |
|  | Shore and Private Angler | 3 | 0 | $29.14 \%$ |
| $\mathbf{3} \mathbf{3}$ | For-Hire | 5 | 19 | $28.75 \%$ |
|  | Shore and Private Angler | 3 | 0 | $29.14 \%$ |
| $\mathbf{4} \mathbf{4}$ | For-Hire | 6 | 21 | $30.02 \%$ |
|  | Shore and Private Angler | 3 | 0 | $29.14 \%$ |

# MEMORANDUM 

Date: $\quad$ November 1, 2019
To: $\quad$ Dr. Chris Moore, Executive Director
From: Matthew Seeley, Staff
Subject: 2020-2021 Bluefish Recreational Management Measures

## Introduction and Background

The 2019 bluefish operational assessment concluded the bluefish stock was overfished, and overfishing was not occurring in 2018 relative to the updated biological reference points. Based on the SSC's recommendation, the Council and Bluefish Board adopted an ABC of 16.28 million pounds for 2020 and 2021. After accounting for expected discards using the Marine Recreational Information Program (MRIP) mean weight approach, this ABC translates to a commercial quota (CQ) of 2.77 million pounds and a recreational harvest limit (RHL) of 9.48 million pounds for 2020 and 2021 (Table 1). Compared to 2019, this represents a 64\% decrease in the CQ and an 18\% decrease in the RHL. In recent years, a portion of the total allowable landings above the expected recreational harvest have been transferred from the recreational fishery to the commercial fishery. However, because the recreational fishery is anticipated to fully harvest the RHL, the Council did not authorize a quota transfer from the recreational to the commercial sectors for 2020-2021. Furthermore, the Council adopted the terminal year landings (2018) as the estimate for expected recreational landings. Thus, the Monitoring Committee (MC) now needs to recommend management measures that will constrain the expected recreational landings (13,270,862 pounds) to the Council approved RHL (9,480,162 pounds). This equates to an expected $28.56 \%$ reduction in recreational harvest.

## Past RHLs and Management Measures

Since 2000, the bluefish fishery has only exceeded the RHL once in 2007 (Table 2). This did not trigger accountability measures because the RHL was exceeded due to a transfer from the recreational to the commercial fishery. Since Amendment 1 (2000), the only implemented management measures have been a federal 15 -fish bag limit. Due to the recent change in stock status to overfished, appropriate management measures are necessary to constrain recreational harvest to a lower RHL. Furthermore, the implementation of recreational management measures constraining harvest offers a smooth transition to the forthcoming rebuilding plan.

Table 1. 2020-2021 Council approved bluefish commercial quota and RHL.

| Management Measure | 2020-2021 |  | Basis for the Recommendation |
| :---: | :---: | :---: | :---: |
|  | M lbs | mt |  |
| ABC | 16.28 | 7,385 | Derived by SSC; Council P* policy |
| ACL | 16.28 | 7,385 | Defined in FMP as equal to ABC |
| Management Uncertainty | 0 | 0 | Derived by MC |
| Commercial ACT | 2.77 | 1,255 | $\begin{aligned} & \text { (ACL - Mgmt. } \\ & \text { Uncertainty) x 17\% } \end{aligned}$ |
| Recreational ACT | 13.51 | 6,130 | $\begin{gathered} \text { (ACL - Mgmt. } \\ \text { Uncertainty) x 83\% } \end{gathered}$ |
| Commercial Discards | 0 | 0 | Value used in assessment |
| Recreational Discards | 4.03 | 1,829 | 2018 Rec. Discards |
| Commercial TAL (pre-transfer) | 2.77 | 1,255 | Comm. ACT - Comm. Discards |
| Recreational TAL (pre-transfer) | 9.48 | 4,301 | Rec. ACT - Rec. Discards |
| TAL Combined | 12.25 | 5,556 | Comm. TAL + Rec. TAL |
| Transfer | 0 | 0 | Calculated so Expected Rec. Landings = RHL (if transfer can occur) |
| Expected Rec Landings | 13.27 | 6,020 | 2018 Rec. Landings |
| Commercial Quota | 2.77 | 1,255 | Comm. TAL + Transfer |
| Recreational Harvest Limit | 9.48 | 4,301 | Rec. TAL - Transfer |

Table 2. Summary of bluefish management measures, 2000-2019 (Values are in million pounds).

| Management Measures | $\mathbf{2 0 0 5}$ | $\mathbf{2 0 0 6}$ | $\mathbf{2 0 0 7}$ | $\mathbf{2 0 0 8}$ | $\mathbf{2 0 0 9}$ | $\mathbf{2 0 1 0}$ | $\mathbf{2 0 1 1}$ | $\mathbf{2 0 1 2}$ | $\mathbf{2 0 1 3}$ | $\mathbf{2 0 1 4}$ | $\mathbf{2 0 1 5}$ | $\mathbf{2 0 1 6}$ | $\mathbf{2 0 1 7}$ | $\mathbf{2 0 1 8}{ }^{8}$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| TAC $^{1} \mathbf{2 0 1 9}^{2}$ | 34.22 | 29.15 | 32.03 | 31.89 | 34.08 | 34.38 | 31.74 | $\mathbf{3 2 . 0 4}$ | $\mathbf{2 7 . 4 7}$ | $\mathbf{2 4 . 4 3}$ | $\mathbf{2 1 . 5 4}$ | $\mathbf{1 9 . 4 5}$ | $\mathbf{2 0 . 6 4}$ | $\mathbf{2 1 . 8 1}$ |
| 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 |
| 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 |
| 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 | $11.58 / \mathrm{NA}$ |
| 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 | $3.64 / 13.27$ |
| Rec. Possession Limit (\# <br> fish) | 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 | $5.84 / 15.47$ |
| 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/ <br> 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 2018 where a " $/$ " is included indicate "old MRIP/new MRIP".

## Recreational Catch, Harvest, and 2019 Projections

According to re-calibrated MRIP estimates, since 1981, recreational bluefish catch has fluctuated from a peak of 75.76 million fish in 1981 to a low of 24.87 million fish in 1988. Harvest fluctuated from a high of 169.63 million pounds in 1981 to a low of 13.27 million pounds in 2018. Thus, 2018 was the worst year for recreational harvest across the time series (Figure 1, Table 3 [19912018]). Bluefish advisors and MC members suspect that 2018 may have been an anomalous fishing year and may not fully represent recent trends in landings. To help account for this variability, the MC initially recommended that the Council approve using the three-year average for expected recreational landings ( 23.15 million pounds). However, the Council used 2018 landings as a proxy for expected recreational landings in 2020 and 2021 because 2018 represents the most recently completed fishing year and is consistent with how expected recreational landings have been proposed in recent years.


Figure 1. Recreational bluefish catch and harvest from 1981-2018.

Table 3. Number of recreational bluefish fishing trips, recreational harvest/catch, recreational landings per trip, and average weight from 1991 to 2018.

| Year |  | Recreational Catch (N) | Recreational Harvest (N) | Recreational <br> Harvest (lbs) | Recreational landings per "bluefish" trip | Average weight/fish (lbs) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Re-Calibrated MRIP Estimates |  |  |  |  |  |  |
| 1991 | 13,896,933 | 41,416,277 | 27,317,926 | 59,792,834 | 2.0 | 2.2 |
| 1992 | 11,409,027 | 29,447,522 | 20,180,578 | 41,217,703 | 1.8 | 2 |
| 1993 | 11,826,365 | 27,427,201 | 15,369,463 | 37,415,750 | 1.3 | 2.4 |
| 1994 | 9,721,530 | 28,624,144 | 13,063,628 | 30,145,680 | 1.3 | 2.3 |
| 1995 | 9,968,256 | 25,084,134 | 11,532,807 | 27,710,092 | 1.2 | 2.4 |
| 1996 | 7,876,695 | 25,864,668 | 11,126,333 | 23,207,235 | 1.4 | 2.1 |
| 1997 | 6,383,072 | 30,448,296 | 12,400,982 | 27,039,375 | 1.9 | 2.2 |
| 1998 | 7,638,343 | 28,511,666 | 13,397,302 | 32,880,412 | 1.8 | 2.5 |
| 1999 | 7,840,089 | 52,596,228 | 16,878,789 | 25,106,100 | 2.2 | 1.5 |
| 2000 | 6,449,833 | 47,102,869 | 12,879,485 | 23,357,120 | 2.0 | 1.8 |
| 2001 | 8,161,746 | 60,512,252 | 18,048,645 | 31,654,978 | 2.2 | 1.8 |
| 2002 | 8,381,422 | 49,810,122 | 17,607,380 | 30,654,388 | 2.1 | 1.7 |
| 2003 | 7,769,721 | 37,746,238 | 16,411,932 | 32,758,670 | 2.1 | 2.0 |
| 2004 | 8,894,616 | 49,239,076 | 18,631,904 | 37,133,463 | 2.1 | 2.0 |
| 2005 | 9,024,550 | 48,482,667 | 18,341,452 | 37,742,807 | 2.0 | 2.1 |
| 2006 | 8,255,002 | 54,310,049 | 19,397,272 | 36,081,958 | 2.3 | 1.9 |
| 2007 | 9,655,930 | 56,313,391 | 19,189,747 | 40,239,101 | 2.0 | 2.1 |
| 2008 | 8,044,324 | 46,045,003 | 14,845,435 | 36,166,834 | 1.8 | 2.4 |
| 2009 | 7,972,341 | 49,866,587 | 18,085,386 | 40,731,438 | 2.3 | 2.3 |
| 2010 | 9,773,363 | 62,350,109 | 21,929,517 | 46,302,792 | 2.2 | 2.1 |
| 2011 | 8,492,874 | 58,290,651 | 20,814,884 | 34,218,748 | 2.5 | 1.6 |
| 2012 | 9,655,507 | 50,658,367 | 18,578,838 | 32,530,917 | 1.9 | 1.8 |
| 2013 | 6,394,975 | 53,494,664 | 19,975,051 | 34,398,327 | 3.1 | 1.7 |
| 2014 | 9,615,976 | 55,093,766 | 21,510,651 | 27,044,276 | 2.2 | 1.3 |
| 2015 | 7,001,696 | 42,148,960 | 13,725,106 | 30,098,649 | 2.0 | 2.2 |
| 2016 | 8,625,069 | 42,528,746 | 14,899,723 | 24,155,304 | 1.7 | 1.6 |
| 2017 | 8,264,782 | 42,159,923 | 13,842,164 | 32,023,497 | 1.7 | 2.3 |
| 2018 | 5,749,291 | 30,928,703 | 10,245,710 | 13,270,862 | 1.8 | 1.3 |

Similar to the approaches used to project landings for other Council managed species, the MC can project 2019 bluefish landings using data from waves 1-4 to estimate overall 2019 landings. The 2019 projections are presented here for context despite the Council's approved value for expected recreational landings. This estimate results in $17,122,744$ pounds harvested compared to the Council approved $13,270,862$, which represents a difference of $3,851,882$ pounds (Table 4). Understanding the difference between the 2018 landings and 2019 projected landings as the assumed expected recreational landings will assist in avoiding an RHL overage in 2020. Using the

Council approved estimate, constraining harvest to the RHL would result in a necessary 28.56\% reduction while constraining harvest using the 2019 projected landings would result in a necessary $44.63 \%$ reduction.

Table 4. 2019 projected recreational harvest (in pounds) by state and values used to calculate projections. Values are based on new MRIP estimates. Projections were calculated using 2019 wave 1-4 harvest and the proportion of annual harvest by wave in 2018.

| State | 2016-2018 <br> wave 1-4 <br> harvest as <br> \% of annual <br> harvest | 2019 wave <br> $\mathbf{1 - 4 ~ h a r v e s t ~}$ | Average <br> annual <br> harvest <br> 2016-2018 | 2019 <br> projected <br> annual <br> harvest | \% of <br> projected <br> 2019 total <br> harvest |
| :--- | :---: | :---: | :---: | :---: | :---: |
| Maine | $100 \%$ | 0 | 27 | 0 | $0.00 \%$ |
| New Hampshire | $100 \%$ | 0 | 7 | 0 | $0.00 \%$ |
| Massachusetts | $64 \%$ | 277,568 | 985,870 | 435,128 | $2.54 \%$ |
| Rhode Island | $44 \%$ | $1,099,034$ | 369,586 | $2,473,273$ | $14.44 \%$ |
| Connecticut | $55 \%$ | 310,130 | 723,794 | 564,494 | $3.30 \%$ |
| New York | $63 \%$ | $3,332,449$ | $4,201,467$ | $5,274,758$ | $30.81 \%$ |
| New Jersey | $71 \%$ | $1,422,351$ | $5,780,646$ | $1,993,690$ | $11.64 \%$ |
| Delaware | $94 \%$ | 322,360 | 903,313 | 344,695 | $2.01 \%$ |
| Maryland | $53 \%$ | 98,268 | 376,809 | 186,960 | $1.09 \%$ |
| Virginia | $52 \%$ | 588,754 | 340,062 | $1,143,155$ | $6.68 \%$ |
| North Carolina | $67 \%$ | $2,120,394$ | $3,207,078$ | $3,175,257$ | $18.54 \%$ |
| South Carolina | $45 \%$ | 463,252 | 533,079 | $1,033,297$ | $6.03 \%$ |
| Georgia | $53 \%$ | 10,435 | 26,489 | 19,599 | $0.11 \%$ |
| Florida | $88 \%$ | $2,213,233$ | $5,701,659$ | $2,528,308$ | $14.77 \%$ |
| Total | $\mathbf{7 2 \%}$ | $\mathbf{1 2 , 2 5 8 , 2 2 8}$ | $\mathbf{2 3 , 1 4 9 , 8 8 7}$ | $\mathbf{1 7 , 1 2 2 , 7 4 4}$ | $\mathbf{1 0 0 \%}$ |

## Accountability Measures

In 2013, the Council modified the recreational accountability measures (AMs) for Mid-Atlantic species through the Omnibus Recreational AM Amendment. Additionally, in the event of an Annual Catch Limit (ACL) overage, recreational AMs no longer necessarily require a direct pound-for-pound payback of the overage amount in a subsequent fishing year. Instead, AMs are tied to stock status. Though paybacks may be required in some circumstances, any potential payback amount is scaled relative to biomass, as described below.

The ACL will be evaluated based on a single-year examination of total catch (landings and dead discards). Both landings and dead discards will be evaluated in determining if the ACL has been exceeded. If the ACL is exceeded, the appropriate AM is determined based on the following criteria:

Recreational landings AM when the ACL is exceeded and no sector-to-sector transfer of allowable landings has occurred. If the fishery-level ACL is exceeded and landings from
the recreational fishery are determined to be the sole cause of the overage, and no transfer between the commercial and recreational sector was made for the fishing year, as outlined in $\S 648.162(\mathrm{~b})(2)$, then the following procedure will be followed:

If biomass is below the threshold, the stock is under rebuilding, or biological reference points are unknown. If the most recent estimate of biomass is below the $\mathrm{B}_{\text {MSy }}$ threshold (i.e., $\mathrm{B} / \mathrm{B}_{\mathrm{MSY}}$ is less than 0.5 ), the stock is under a rebuilding plan, or the biological reference points ( B or $\mathrm{B}_{\mathrm{Msy}}$ ) are unknown, and the ACL has been exceeded, then the exact amount, in pounds, by which the most recent year's recreational catch estimate exceeded the most recent year's ACL will be deducted from the following year's recreational ACT, or as soon as possible thereafter, once catch data are available, as a single-year adjustment.

If the ACL has been exceeded. If the ACL has been exceeded, then adjustments to the recreational management measures, taking into account the performance of the measures and conditions that precipitated the overage, will be made in the following fishing year, or as soon as possible thereafter, once catch data are available, as a single-year adjustment.

## Monitoring Committee Responsibility

The Monitoring Committee must consider and recommend management measures to ensure that landings in 2020 will not exceed the 2020 RHL. Recreational possession limits, minimum fish size limits, and seasons can be modified to achieve this goal.

Harvest in 2018 is used as the 2020 harvest proxy when considering such measures under the assumption that conditions in 2020 will be similar to those in 2018. Based on the 2018 harvest proxy of 13.27 million pounds, it is assumed that status quo recreational management measures will result in a $28.56 \%$ overage compared to the 2020 and 2021 RHL of 9.48 million pounds.

## Recreational Harvest Constraining Alternatives

The following alternatives were developed to achieve the necessary 28.56\% reduction in recreational harvest. Size limit alternatives have been proposed but are not recommended due to angler preference to often harvest smaller fish since larger bluefish are deemed less desirable. Furthermore, the MC can explore a combination of the presented alternatives to assist in meeting the necessary reduction.

## Size Limits

To constrain harvest, the MC can consider implementing a minimum size limit (fork length) for bluefish, but consideration should be given to the size at which bluefish are mature. According to SAW/SARC 60, $50 \%$ of bluefish coastwide are mature at 11.76 inches and $95 \%$ at 17.45 inches. Based on a length frequency distribution calculated using re-calibrated MRIP estimates, an 8-inch minimum size will result in a $28.62 \%$ reduction meeting the Council/Board required reduction in harvest. To ensure that approximately $50 \%$ of the population can spawn at least once, a 12 -inch minimum size results in a $63.92 \%$ reduction (Table 5). Furthermore, the MC should note that the expanded lengths show anglers are keeping 4-inch fish, which may not be consistently represented throughout the fishery.

Table 5. Expanded length frequencies of landed bluefish, 2016-2018, from Maine through Florida, as a percent of total recreational landings of bluefish.

| Fork Length (Inches) | N Landings (Sum) | \% of Total Landings | Cumulative \% |
| :---: | :---: | :---: | :---: |
| 4 | 870,272 | $2.23 \%$ | $2.23 \%$ |
| 5 | $2,456,210$ | $6.30 \%$ | $8.53 \%$ |
| 6 | $2,513,814$ | $6.45 \%$ | $14.98 \%$ |
| 7 | $2,554,204$ | $6.55 \%$ | $21.53 \%$ |
| 8 | $2,762,542$ | $7.09 \%$ | $28.62 \%$ |
| 9 | $3,394,296$ | $8.71 \%$ | $37.32 \%$ |
| 10 | $3,563,355$ | $9.14 \%$ | $46.46 \%$ |
| 11 | $3,387,727$ | $8.69 \%$ | $55.15 \%$ |
| 12 | $3,417,832$ | $8.77 \%$ | $63.92 \%$ |
| 13 | $2,334,301$ | $5.99 \%$ | $69.91 \%$ |
| 14 | $1,297,979$ | $3.33 \%$ | $73.23 \%$ |
| 15 | $1,118,902$ | $2.87 \%$ | $76.10 \%$ |
| 16 | $1,667,740$ | $4.28 \%$ | $80.38 \%$ |
| 17 | $1,849,626$ | $4.74 \%$ | $85.13 \%$ |
| 18 | 722,462 | $1.85 \%$ | $86.98 \%$ |
| 19 | 447,313 | $1.15 \%$ | $88.13 \%$ |
| 20 | 602,034 | $1.54 \%$ | $89.67 \%$ |
| 21 | 296,521 | $0.76 \%$ | $90.43 \%$ |
| 22 | 192,002 | $0.49 \%$ | $90.92 \%$ |
| 23 | 166,507 | $0.43 \%$ | $91.35 \%$ |
| 24 | 214,936 | $0.55 \%$ | $91.90 \%$ |

## Seasonal Closures

All states are required to maintain fair and equitable access to the fishery. This may be difficult to achieve through seasonal closures due to bluefish's migratory life history (Table 6 and 7). During the winter, bluefish are more accessible to the southern states while they are more accessible to the northern states in the summer. The alternatives below take this into account when possible.

Close waves 1 and 2
Close waves 5 and 6
Combination of closures: close different waves in the north and south

Table 6. Annual average percent of bluefish harvest (pounds) by state and wave from 20162018 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 7. 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 (pounds)

| 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 | $\mathbf{0 . 0 6 \%}$ | $\mathbf{0 . 4 3 \%}$ | $\mathbf{0 . 4 8 \%}$ | $\mathbf{0 . 2 0 \%}$ | $\mathbf{0 . 3 4 \%}$ | $\mathbf{0 . 1 3 \%}$ |

## Bag Limits

The current federal bag limit is 15 fish. Reducing the bag limit to 3 fish will result in decreased harvest by the necessary $28.56 \%$ (Table 8). However, a decreased bag limit may lead to increased discards through incidental encounters. Alternatively, the increased discards may be offset by decreased effort as many anglers may not target bluefish because as advisors indicated, the 15 fish limit is great incentive for anglers to want to target bluefish.

Table 8. Associated percent reduction in harvest if the bag limit was reduced to 1-10 fish for 2016-2018 based on revised MRIP estimates using group catch data. This analysis assumes that all non-compliant anglers (landing greater than 15 fish) will continue to be noncompliant and that previous compliant anglers (land 15 fish or less) will comply with the proposed regulations and land the full bag limit if they were previously landing higher than the proposed limits.

| Bag Limit | Percent Reduction |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\mathbf{2 0 1 8}$ |  | $\mathbf{2 0 1 7}$ |  | $\mathbf{2 0 1 6}$ |  | Average <br> $\mathbf{( 2 0 1 6 - 2 0 1 8 )}$ |  |
|  | No <br> Discards | Discards | No <br> Discards | Discards | No <br> Discards | Discards | No <br> Discards | Discards |
|  | $-2.50 \%$ | $-2.12 \%$ | $-2.03 \%$ | $-1.57 \%$ | $-2.96 \%$ | $-2.50 \%$ | $-2.50 \%$ | $-2.06 \%$ |
| $\mathbf{9}$ | $-4.01 \%$ | $-3.41 \%$ | $-3.19 \%$ | $-3.01 \%$ | $-4.27 \%$ | $-4.08 \%$ | $-3.82 \%$ | $-3.50 \%$ |
| $\mathbf{8}$ | $-5.69 \%$ | $-4.84 \%$ | $-4.71 \%$ | $-4.48 \%$ | $-5.67 \%$ | $-5.46 \%$ | $-5.36 \%$ | $-4.93 \%$ |
| $\mathbf{7}$ | $-8.23 \%$ | $-6.99 \%$ | $-6.50 \%$ | $-6.23 \%$ | $-7.47 \%$ | $-7.20 \%$ | $-7.40 \%$ | $-6.81 \%$ |
| $\mathbf{6}$ | $-11.18 \%$ | $-9.50 \%$ | $-9.34 \%$ | $-8.91 \%$ | $-10.02 \%$ | $-9.64 \%$ | $-10.18 \%$ | $-9.35 \%$ |
| $\mathbf{5}$ | $-15.29 \%$ | $-13.00 \%$ | $-13.11 \%$ | $-12.54 \%$ | $-14.56 \%$ | $-13.88 \%$ | $-14.32 \%$ | $-13.14 \%$ |
| $\mathbf{4}$ | $-20.58 \%$ | $-17.49 \%$ | $-18.69 \%$ | $-17.85 \%$ | $-21.20 \%$ | $-20.21 \%$ | $-20.16 \%$ | $-18.52 \%$ |
| $\mathbf{3}$ | $-29.89 \%$ | $-25.40 \%$ | $-26.30 \%$ | $-\mathbf{- 2 5 . 1 6 \%}$ | $-\mathbf{- 3 0 . 1 5 \%}$ | $-\mathbf{- 2 8 . 8 1 \%}$ | $-\mathbf{- 2 8 . 7 8 \%}$ | $-26.46 \%$ |
| $\mathbf{2}$ | $-43.36 \%$ | $-36.85 \%$ | $-38.02 \%$ | $-36.27 \%$ | $-43.47 \%$ | $-41.47 \%$ | $-41.61 \%$ | $-38.20 \%$ |
| $\mathbf{1}$ | $-62.27 \%$ | $-52.93 \%$ | $-56.19 \%$ | $-53.46 \%$ | $-61.80 \%$ | $-59.05 \%$ | $-60.09 \%$ | $-55.15 \%$ |

## Staff Recommendation

The Council approved expected recreational landings of $13,270,862$ pounds is $28.56 \%$ higher than the 2020 RHL of $9,480,162$ pounds. Thus, staff recommends a coastwide 3-fish bag limit to constrain harvest by $28.78 \%$ (no discards) so that the 2020 recreational harvest does not exceed the RHL.

#  <br> NEW YORK RECREATIONAL \& FOR-HIRE FISHING ALLIANCE "LETUS FISH" 

November 27, 2019

Michael Pentony, Regional Administrator<br>National Marine Fisheries Service<br>55 Great Republic Drive, Gloucester, MA 01930<br>cc: Dr. Christopher M. Moore. Executive Director - MAFMC<br>Matthew Seeley, Fishery Management Specialist - MAFMC

RE: Bluefish 2020 Recreational Specifications

Mr. Pentony,
On behalf of the New York Recreational \& For-Hire Fishing Alliance (NY RFHFA), their crew members, and the tens of thousands of recreational anglers that fish aboard party and charter vessels each year, we offer the following comments relative to the proposed 2020 recreational Bluefish measures for the December 2019 Council Meeting in Annapolis, MD.

Based upon the concerns heard from for-hire operators, stakeholders, and fishermen within the NY Marine Coastal District the NY RFHFA is strenuously opposed to the proposed reductions made in the November 1, 2019, '2020-2021 Bluefish Recreational Management Measures' in which:
"Staff recommends a coastwide 3-fish bag limit to constrain harvest by 28.78\% (no discards) so that the 2020 recreational harvest does not exceed the RHL."

For the last half of a century, bluefish have been one of the most important recreational species for not only the for-hire fleet, but recreational angling public who look forward in catching one of the most exciting inshore gamefish to which they have access to. Bluefish were the primary species which led to the aluminum party boat construction boom throughout the 1970s and 1980s, as well as being a major economic driver for the bait \& tackle industry in New York City and on Long Island.

Since that time, the popularity of bluefish has lessened due to the greater abundance and preference in fishing for striped bass, summer flounder, black sea bass and scup. There has also been a noticeable socio-demographic change in the population of fishermen who target saltwater fish in the downstate region of New York over the last two decades. More so, this has occurred during what has been the apparent change to the traditional migration patterns of various species in the spring and fall time period which now align with documented NMFS data on north and eastward stock shifting due to warming waters especially during the time period from a story on bluefish from last season as reported by stakeholders in the bordering and shared waters fishing fleet in New Jersey. ${ }^{(1)}$

[^0]For the party and charter boat industry in the NY Marine Coastal District as well as the secondary businesses that rely economically upon the recreational fishing activities derived from the bluefish fishery, it has been one over the last few years to maintain the sustainability of these fishing businesses by continuing to provide the fishing public with the ability to take home a reasonable amount of bluefish. This is at a time when most, bay, shoreline, nearshore and mid-offshore species have either:

- A by-catch possession limit of seven or less fish or,
- Such high minimum size limits that exceed the productivity and availability of fish in a given area or,
- The shortened number of open days during the calendar year which a for-hire vessel can target or an angler can legally have access to and harvest a particular finfish species.

Using the latest new MRIP data sets for the four recreational modes it is extremely apparent that the for-hire industry in the Mid-Atlantic and New England region accounts for less than 5\% of coastal harvest. More so, reported recreational landings in New York when looking over a time series during the past five season (four full seasons plus half of 2019), the total harvest number as a percentage comparison between party and charter vs private vessel and shore bound mode is even lower percentage in removals for New York for-hire fishers.

| Estimate Status | Year | $\begin{aligned} & \text { Common } \\ & \text { Name } \end{aligned}$ | BLUEFISH NEW YORK Fishing Mode | Total <br> Harvest $(A+B 1)$ | PSE | Harvest (A+B1) Total Weight (lb) | PSE | Average Length (in) | PSE | Average Weight (lb) | PSE |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| FINAL | 2015 | BLUEFISH | SHORE | 1,423,577 | 36.1 | 2,608,938 | 32.2 | 13.1 | 46.9 | 1.8 | 48.4 |
| FINAL | 2015 | BLUEFISH | PARTY BOAT | 30,753 | 37.7 | 185,990 | 48.6 | 22.2 | 56.2 | 6.0 | 61.5 |
| FINAL | 2015 | BLUEFISH | CHARTER BOAT | 103,587 | 61.5 | 806,574 | 59.3 | 25.9 | 86.6 | 7.8 | 85.5 |
| FINAL | 2015 | BLUEFISH | PRIVATE/RENTAL BOAT | 879,895 | 24.7 | 4,516,911 | 26.1 | 20.5 | 34 | 5.1 | 36 |
| FINAL | 2016 | BLUEFISH | SHORE | 1,057,171 | 41.9 | 680,207 | 46.7 | 8.3 | 56 | 0.6 | 62.7 |
| FINAL | 2016 | BLUEFISH | PARTY BOAT | 35,987 | 33 | 119,959 | 33.1 | 17.6 | 46.5 | 3.3 | 46.7 |
| FINAL | 2016 | BLUEFISH | CHARTER BOAT | 24,983 | 21.2 | 147,358 | 22.5 | 23.4 | 29.9 | 5.9 | 30.9 |
| FINAL | 2016 | BLUEFISH | PRIVATE/RENTAL BOAT | 959,925 | 23.7 | 4,094,857 | 25.7 | 20.0 | 33.6 | 4.3 | 34.9 |
| FINAL | 2017 | BLUEFISH | SHORE | 2,147,008 | 29.5 | 1,698,588 | 45.1 | 8.6 | 40 | 0.8 | 53.9 |
| FINAL | 2017 | BLUEFISH | PARTY BOAT | 18,294 | 14.2 | 57,698 | 25.8 | 17.4 | 22 | 3.2 | 29.4 |
| FINAL | 2017 | BLUEFISH | CHARTER BOAT | 38,114 | 23.4 | 290,462 | 25 | 25.2 | 33.5 | 7.6 | 34.3 |
| FINAL | 2017 | BLUEFISH | PRIVATE/RENTAL BOAT | 861,143 | 44.7 | 4,115,755 | 43.5 | 18.9 | 61.3 | 4.8 | 62.4 |
| FINAL | 2018 | BLUEFISH | SHORE | 884,073 | 33.5 | 692,359 | 37.1 | 9.1 | 46 | 0.8 | 50 |
| FINAL | 2018 | BLUEFISH | PARTY BOAT | 7,489 | 31 | 10,130 | 33 | 13.2 | 43.2 | 1.4 | 45.3 |
| FINAL | 2018 | BLUEFISH | CHARTER BOAT | 9,708 | 27.6 | 21,912 | 28.3 | 16.4 | 38.8 | 2.3 | 39.5 |
| FINAL | 2018 | BLUEFISH | PRIVATE/RENTAL BOAT | 302,297 | 26.8 | 675,117 | 25.1 | 15.9 | 37.5 | 2.2 | 36.7 |
| PRELIMINARY | 2019 | BLUEFISH | SHORE | 1,380,419 | 29.3 | 1,538,272 | 50.1 | 9.7 | 40.9 | 1.1 | 58 |
| PRELIMINARY | 2019 | BLUEFISH | PARTY BOAT | 11,077 | 32.1 | 18,881 | 39.2 | 14.9 | 47 | 1.7 | 50.6 |
| PRELIMINARY | 2019 | BLUEFISH | CHARTER BOAT | 4,798 | 49.5 | 50,895 | 59 | 27.7 | 72.7 | 10.6 | 77 |
| PRELIMINARY | 2019 | BLUEFISH | PRIVATE/RENTAL BOAT | 511,792 | 27.5 | 1,724,402 | 26.1 | 18.4 | 38.5 | 3.4 | 37.9 |

## Further when looking at the breakdown of recreational harvest and released bluefish over the past decade, the for-hire industry in New York has an extremely minor to insignificant impact to the overall coastal bluefish biomass.

| Year | Common Name | Observed Harvest (A) | PSE | Reported Harvest (B1) | PSE | Released Alive (B2) | PSE |
| ---: | :--- | ---: | ---: | ---: | ---: | ---: | ---: |
| 2010 | BLUEFISH | 95,088 | 19.2 | 77,801 | 23.4 | 79,826 | 17.1 |
| 2011 | BLUEFISH | 55,148 | 34.8 | 77,009 | 32.3 | 75,601 | 31 |
| 2012 | BLUEFISH | 143,746 | 15.3 | 142,642 | 16.6 | 131,316 | 12.8 |
| 2013 | BLUEFISH | 217,932 | 26.4 | 406,207 | 22.1 | 77,376 | 19 |
| 2014 | BLUEFISH | 125,860 | 14.9 | 28,004 | 52.9 | 91,116 | 42.2 |
| 2015 | BLUEFISH | 65,916 | 46.3 | 68,424 | 61.6 | 6,398 | 60.2 |
| 2016 | BLUEFISH | 53,360 | 23.8 | 7,609 | 37.9 | 32,939 | 32.3 |
| 2017 | BLUEFISH | 44,531 | 15.1 | 11,877 | 54.1 | 16,552 | 30 |
| 2018 | BLUEFISH | 13,575 | 24.4 | 3,622 | 35 | 5,769 | 28 |
| 2019 | BLUEFISH | 8,358 | 36.8 | 7,517 | 39.5 | 8,663 | 30.7 |

The current reduction table ${ }^{(2)}$ noted in the November 22, 2019 Memorandum from Matthew Seeley Fishery Specialist to the Council and Board, has some disturbing implications for not only the New York recreational fishermen, but any other state that has a for-hire fleet which fishes for bluefish during the year. The severity of the proposed reductions within the various alternatives will most certainly result in a negative economic impact to the for-hire sector within any state by removing one of the most valuable marketing tools in which an angler not only perceives, but has the likelihood to take home a reasonable number of bluefish.

For the handful of party boats in New York which specifically sail for bluefish during the season, the current possession limit is critical for them to somewhat maintain their sailing schedule in 2020 in this fishery.
${ }^{(2)}$ See Table 4. 'Alternatives to constrain coastwide harvest with associated percent reductions in harvest using coastwide bluefish bag and size limits from 2016-2018'
https://static1.squarespace.com/static/511cdc7fe4b00307a2628ac6/t/5ddd9091 377ff72cee4303cc/1574801555046/Tab10 Bluefish-Rec-Measures 2019-12.pdf

The recreational regulatory proposal the NY RFHFA is recommending, is to review the differential possession limit approach developed and adopted for 'Blueline Tilefish in Amendment 6 to the Tilefish FMP.' The recognition in using decades of historical MRIP data on angler trip harvest by party and charter is well known to be much higher than the reported average of 1 to 3 bluefish for private vessel and shore bound mode fishermen.

In scaling down from the current 2019 bluefish possession limit of 15 fish to a reduction or "actual tangible cut to the for-hire fishermen" of
roughly one third in what they could possess in 2019 with 10 bluefish, or at the lowest minimum a cut of approximately half with eight fish in 2020. In addition, we do expect that any cut in the possession limit combined with a 'new' minimum size limit now attached to possessing a bluefish in the coming year on for-hire vessels, will not only exponential increase discard mortality, but continue to reduce the appeal for any full day bluefish trips in the coming years.

Atlantic bluefish along the east coast from Florida northward to Maine have a storied history during the $20^{\text {th }}$ century with periods of becoming surprising scarce for no documented reason, and then quickly cycling up to an unending abundance as seen during the early 1970s through late 1990s. During the peak of the contemporary bluefish fishery, old time captains have stated,
"The more you caught, so many more bluefish would then take their place the following day, throughout the season and in the coming year."

Bluefish have changed their spring, summer and fall migratory patterns due to changes in seasonal water temperatures, availability or lack of various forage fish, and the ever changing eco-system and water quality conditions. The current fishery performance pattern the for-hire industry is now experiencing during the season is with large schools of bluefish 'herding up' as they move to a inshore area, remaining for a few weeks of time, and then quickly moving on as waters either warm up or cool down. There has been a noticeable diminished abundance of larger, resident bluefish during the summer and early fall, yet during the same time of the season, for-hire operators along with fishers commenting or showing pictures of a limit catch of "gorilla-sized" bluefish when fishing in Long Island Sound or when fishing further
offshore, even in the local canyons when directly targeting tilefish or tuna.

In closing, the New York Recreational and For-Hire Fishing Alliance would like to thank Matt Seeley for his work, outreach in informing and answering questions as well as his consideration to stakeholders during the bluefish scoping process and various meetings from over the past two years in order to more accurately gauge the performance of this fishery for all user groups.

The NY RFHFA continues to support sustainable fishing practices aboard the party and charter fleet, and encourages all anglers to only harvest what they can personally use at home after a day of blue fishing. Thank you for the opportunity to comment on the proposed changes to the bluefish possession limit, and we hope our input will be helpful as you consider recreational regulatory changes in 2020 and in the follow years.

Sincerely,

## Steven Cannizzo, NY RFHFA

New York Recreational \& For-Hire Fishing Alliance
Executive Director Captain Joe Tangel, fv KING COD
Board Member Captain Jimmy Schneider, James Joseph Fleet
Board Member Captain Carl Forsberg, Viking Fleet
Board Member Captain Kenny Higgins, Captree Pride
Board Member Captain Anthony Testa Sr., f/v Steffani Ann
Board Member Captain Anthony Testa Jr., fv Steffani Ann

Also in consultation with Captain Steven Withuhn, TOP HOOK charters MTK, formerly on the MAFMC Bluefish Advisory Panel and currently a NYS MRAC advisory member.


[^0]:    ${ }^{(1)}$ See APP, ‘Have bluefish changed their habits?’ Dan Radel, Asbury Park Press, Published Sept. 1, 2018;
    https://www.app.com/story/sports/outdoors/fishing/hook-line-and-sinker/2018/09/01/hook-line-sinker-nj-fishing-bluefish/1143797002/

