Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901-3910
Phone: 302-674-2331 | Toll Free: 877-446-2362 | FAX: 302-674-5399 | www.mafmc.org
Richard B. Robins, Jr., Chairman | Lee G. Anderson, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

DATE: July 17, 2014

TO: Chris Moore, Executive Director

FROM: Jim Armstrong, Staff Lead, Bluefish FMP

SUBJECT: Bluefish ABC and Management Measures for 2015

Executive Summary

The 2014 bluefish assessment update indicates that the bluefish stock is not overfished and overfishing is not occurring. The estimate of stock biomass (123,716 mt) for 2013 is 84.1 % of B_{MSY} (147,052 mt) and realized F for 2013 (0.118) is below F_{MSY} (0.19). Staff has identified acceptable biological catch (ABC) = 9,772 mt for 2015, consistent with Council risk policy for a tier 3 assessment and a species with a typical life history, a B/B_{MSY} ratio of 0.7506, and OFL = 15,522 mt. According to the FMP, ACL is set equal to ABC. It is recommended that the commercial and recreational Annual Catch Targets (ACTs) sum to ACL and ABC (no buffer for management uncertainty). After adjusting the ACTs for discards (1,520 mt), the commercial and recreational total allowable landings (TALs) sum to (8,252 mt). The maximum allowable transfer of landings to the commercial fishery would result in a recreational harvest limit (RHL) of 6,113 mt and a commercial quota of 2,139 mt before adjusting for RSA. Staff recommends that up to 3% of the TALs (248 mt) be made available to the Research Set-Aside (RSA) Program. Staff also recommends reducing the current recreational bag limit to 10 fish.

Introduction

Specification of bluefish management measures is a joint process conducted annually by the Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission's Bluefish Management Board (Board) with information and recommendations coming from their associated committees. The Commission's Bluefish Stock Assessment Sub-Committee (SASC) updates the bluefish assessment and conducts short term projections. The Council's Scientific and Statistical Committee (SSC) reviews assessment results and determines the acceptable biological catch (ABC) for the upcoming year. ABC is a reduction from the overfishing limit (OFL) based on the SSC's consideration of scientific uncertainty and serves as an upper limit on the catch target that management measures attempt to achieve. The Council's Bluefish Monitoring Committee (MC) develops and recommends specific coastwide (Maine – E. Coast Florida) management measures and allocations that will achieve target catch and make 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 National Marine Fisheries Service.

In this memorandum, information is presented to assist the SSC and MC in their roles in the specification process. Assessment update results are presented briefly, and a more detailed summary prepared by the SASC is distributed under separate cover.

Catch and Landings

As shown in Figure 1, from the early 1980s to the early 1990s, recreational landings estimates declined dramatically (avg. 1981-1983 = 40,433 mt; avg. 1991-1993 = 11,727 mt). Recreational landings estimates continued to decline at a somewhat slower rate until reaching a low of 3,744 mt in 1999. A rebuilding plan was implemented in 2000 and the stock was declared rebuilt in 2009. Since 2000, recreational landings estimates grew to a peak of 9,608 mt in 2007, and then declined to an all-time low of 4,846 mt in 2012. In 2013, recreational landings increased to 6,980 mt. Estimated recreational discards increased from less than 10% of the rec catch in the 1980s to an average of 22% of the rec catch in the 2000s. Commercial landings have declined at a slower rate over the landings history, from around 7,000 mt in the early 1980s to around 3,000 mt in the 2000s. The 2013 commercial landings at 1,961 mt is the lowest on record. Commercial discards are treated as insignificant and are not estimated in the current assessment.

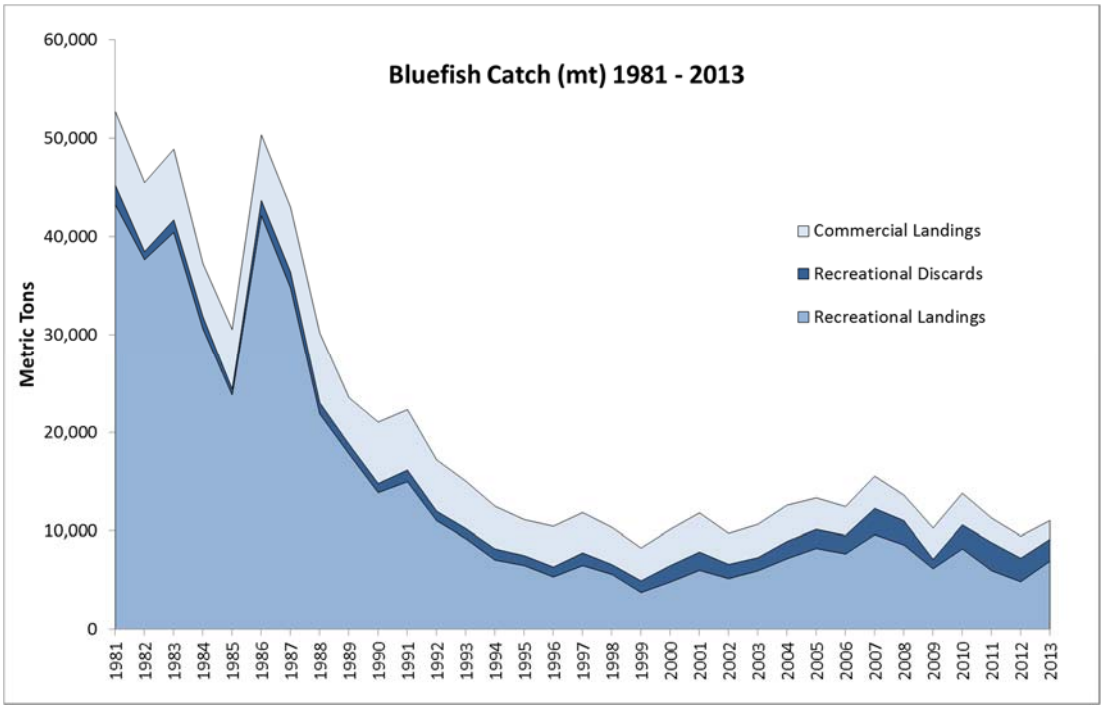

Figure 1. Time series of bluefish recreational and commercial landings and discards (Data Source: 2014 Assessment Update).

Regulatory Review (Current Management Measures)

For the current 2014 fishing year, bluefish ABC (12,461 mt) was based on P* = 0.341 which was calculated using OFL_{2014} = 16,506 mt, B_{2013}/B_{MSY} =0.8113, CV for OFL = 100%, and life history = "typical".

Specific sources of uncertainty in the assessment that have been noted by the SSC include:

- Missing data in the age-length keys (ALKs)
- Calibration of Albatross vs. Bigelow trawl catches
- Previously sampled near shore areas unavailable to the BIGELOW.

- Commercial discards assumed insignificant
- Significant population biomass (~40%) aggregated in the 6+ age group
- Uncertainty in the MRFSS estimates, in general

According to the FMP, ACL is set equivalent to ABC and, given the historic underharvest of landings allowances by the fishery the Monitoring Committee concluded that no deduction to accommodate management uncertainty was needed, so ABC = ACL = ACT. Specifically, the recreational ACT (83%) is 9,198 mt and the commercial ACT (17%) is 1,884 mt. Estimated discards for the 2014 fishery are the average observed discards for the past three years and were 1,520 mt for the recreational fishery and zero for the commercial fishery. The resulting recreational TAL for 2014 is 7,678 mt and the commercial TAL is 1,884 mt. The FMP stipulates that if 17% of the TAL is less than 4,763 mt (10.5 M lb), then a transfer of landings could be made to increase the commercial quota to a limit of 4,763 mt as long as the combined commercial and recreational landings would not exceed the TAL.

In the specification of management measures for 2014, an estimate of recreational harvest for 2014 (5,978 mt) was reported. Accordingly, a transfer of 1,515 mt to the commercial fishery was made resulting in an initial commercial quota of 3,399 mt and an initial RHL of 6,163 mt. An adjustment for research set aside resulted in a final commercial quota of 3,297 mt and a final RHL of 5,978 mt.

Biological Reference Points

Bluefish biological reference points were established in the most recent benchmark assessment (41st SARC; NEFSC 2005). The reference points are based on output from the ASAP model, a forward projecting statistical catch-at-age model that is used to estimate current and historic population size and fishing mortality (Legault and Restrepo 1998).

Overfishing is defined as occurring above F_{MSY} is 0.19, which was determined internally to the ASAP model. Overfishing is prevented by setting management measures based on ABC which is calculated using the Council's risk policy for a Tier 3 assessment (P* method).

The estimate of B_{MSY} is 147,051 mt, and the level at which the stock is determined to be overfished (½ B_{MSY}) is 73,525.5 mt. B_{MSY} was estimated in the 2005 assessment using SSB and recruit estimates from ASAP, fit externally to a Beverton-Holt stock-recruit model and subsequently using Thompson-Bell Yield and SSB/R.

Stock Status and Projections

The current update uses MRIP instead of MRFSS data as recreational inputs for 2004 forward. The effect is that of minor shifts, but no significant change in recreational estimates.

The ASAP estimate of fishing mortality for 2013 is 0.118, below the F threshold (F_{MSY} = 0.19). This outcome supports the statement that for 2012 *overfishing was not occurring*. Model estimates of annual F have been below threshold levels since 1995 (see Figure 2), consistent with catches that support growth in population biomass.

Within the past 20 years, estimated population abundance peaked in 2006 at 90.369 million fish, but has declined since to 59.543 million fish in 2013 (Table 9 in the Assessment Update). The current low is due largely to model estimates of weak year class strength rather than high fishing mortality. The 2012 year class is the lowest in the time series. Retrospective analysis of recruitment estimates showed underestimation of terminal year classes in the previous assessment update, but in the current update, the

retrospective pattern is less evident (Figure 10 in the Assessment Update). Recreational catches of age zero fish have been lower in recent years (about 3% of the rec catch in 2009-2011) than the long term average (around 18% in 1982-2008).

The time series of estimated stock biomass has increased by about 158% since 1996 (See Figure 3 below and Table 10 in the Assessment Update). The estimate of total biomass for 2013 is 123,716 mt which is 84% of B_{MSY} (147,052 mt) and 168% of the ½ B_{MSY} threshold (73,526). As such, *the stock is not overfished*.

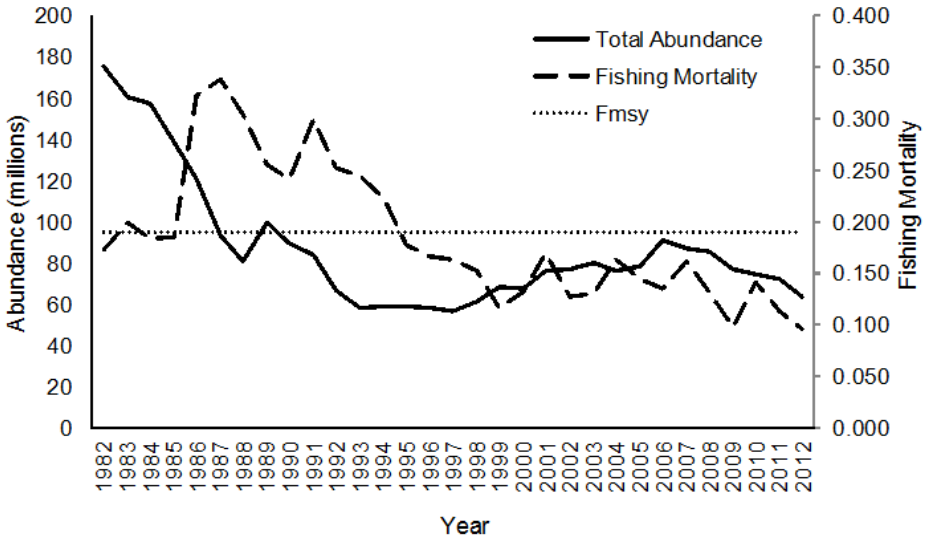

Figure 2. Total bluefish abundance and fishing mortality as estimated in ASAP model. FMSY is indicated by the solid horizontal line. (Source: 2014 Assessment Update)

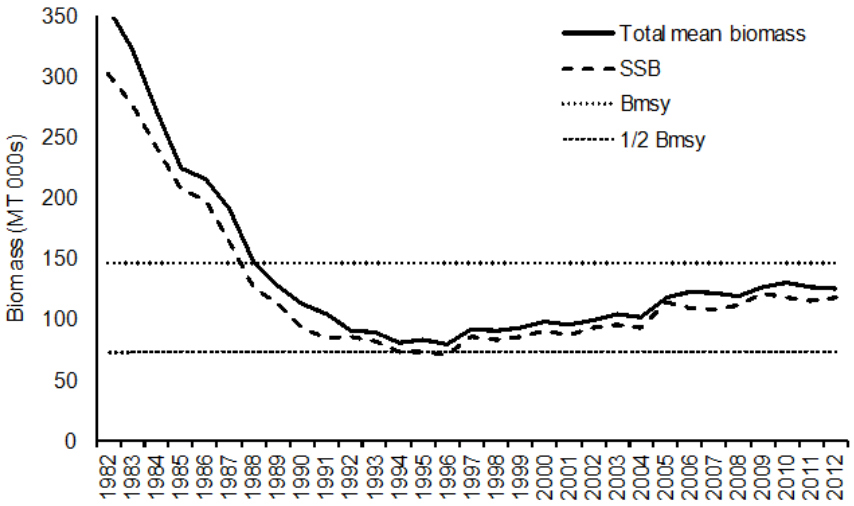

Figure 3. Time series of bluefish total mean biomass (000s mt) and spawning stock biomass (000s mt) relative to Bmsy target and threshold. (Source: 2014 Assessment Update)

ABC Recommendation

Since the implementation of the Omnibus ACL/AM Amendment (Bluefish Amendment 3) in 2012, ABC for bluefish has been calculated using the Council's Risk Policy for a tier-3 assessment and a species with a typical life history. Consistent with that approach, the needed inputs include OFL (projected catch at F_{MSY}) and $B_{CURRENT}/B_{MSY}$. For 2015, OFL is projected to be 15,520 mt and B_{2014}/B_{MSY} is 0.7506 which results in ABC = 9,772 mt. This corresponds to an estimated probability of overfishing (P*) = 0.289 and ABC = 62.95% of OFL.

It may be noted that if the above ABC is adopted it continues a decline in ABC of approximately 12% annually (33% total) since the 2012 specification year even though catches have not achieved specified limits and biomass appears to be stable (i.e., Figure 3). The driver for the annual declines in ABC is serial reductions in terminal year estimates of biomass (retrospective pattern) which has resulted in declining B/B_{MSY}. Figure 4 provides the biomass time series for the last four assessment updates.

Table 1. Changes in OFL, ABC, B/B_{MSY} for 2012-2015 specification years. (Metric Tons)

Specif. Year	OFL	ABC	Change	Mean Biomass		$B_{Proj}/Bmsy$
				Term Year	Proj Year	
2012	18,572	14,535		145,455	141,833	96.50%
2013	17,521	12,461	-14.3%	132,890	127,577	86.80%
2014	16,506	11,082	-11.1%	125,808	119,311	81.10%
2015	15,522	9,772	-11.8%	123,716	110,378	75.10%

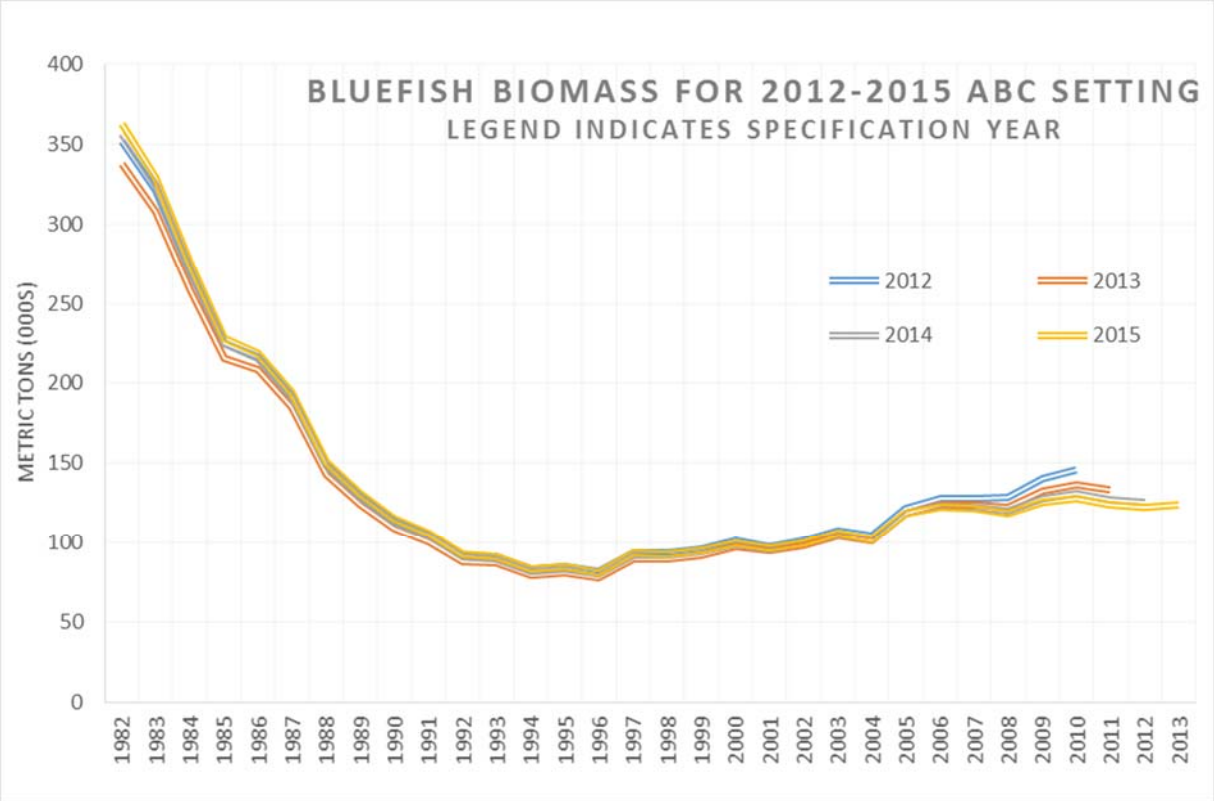

Figure 4. Time series of bluefish total biomass (000s mt) from the assessment updates used for the 2012-2015 specification years. (Source: 2011-2014 Assessment Updates)

Other Management Measures

Derivation of the management measures discussed in this section is provided in Table1.

Annual Catch Limit

Under the Omnibus Amendment, an annual catch limit (ACL) is set equal to ABC. Accordingly, the recommended ACL for bluefish for 2015 is 9,772 mt.

Table 2. Bluefish management measures for 2015 based on ABC = 9,772 mt.

2014 Management Measure	Basis	mt	M lb
OFL		15,520	34,215,743
ABC	Constant F (0.132)	9,772	21,543,572
ACL	= ABC	9,772	21,543,572
Mgmt Uncertainty	per MC	0	0
Comm Discards	from assessment	0	0
Rec Discards	Three Year Average	1,520	3,351,026
Comm ACT	(ACL - Mgmt Uncert) * 17%	1,661	3,662,407
Rec ACT	(ACL - Mgmt Uncert) * 83%	8,111	17,881,165
Comm TAL	Comm ACT - Disc	1,661	3,662,407
Rec TAL	Rec ACT - Disc	6,591	14,530,139
TAL (combined)	Comm + Rec TAL	8,252	18,192,546
Expected Recreational Landings	Three Year Average	5,930	13,073,412
Maximum Transfer	Calculated	477	1,052,394
pre-RSA Comm Quota	Comm TAL + transfer	2,139	4,714,802
pre-RSA RHL	Rec TAL - transfer	6,113	13,477,744
Comm RSA Deduction (3%)	3% of Comm Quota	64	141,444
Rec RSA Deduction (3%)	3% of RHL	183	404,332
Adjusted Comm Quota	Comm Quota - RSA	2,074	4,573,358
Adjusted RHL	RHL - RSA	5,930	13,073,412

ACT and TAL

The FMP prescribes an initial allocation of 17% of the ACL to the commercial ACT and 83% to the recreational ACT (Table 2) which is based on the historic proportion of commercial and recreational landings for the period 1981-1989. Prior to this initial split, however, a reduction from ACL can be made in order to accommodate management uncertainty. As an initial proposal and in order to avoid impinging further on the commercial fishery given the reductions in ABC (Tables 1 and 2), staff recommend no reduction from ACL for management uncertainty.

A reduction of the commercial and recreational ACTs to their respective TALs is mandatory and is calculated as ACT – discards for each fishery. No adjustment is made in calculating the commercial TAL since commercial discards are not currently estimated in the assessment and are assumed to be negligible. The adjustment to the Rec ACT for discards accommodates the updated discard estimate of

1,520 mt (average of the last three years). The combined TAL is 8,252 mt; Table 2).

Quota Transfer and Initial RHL and Commercial Quota

The FMP stipulates that if 17% of the combined TAL is less than 10.5 M lb (4,763 mt) then the commercial quota could be increased to as much as 10.5 M lb as long as the recreational fishery is projected to land less than 83% of the TAL in the specification year. The recreational fishery is expected to land 5,930 mt (72% of the TAL) and as such a transfer of 477 mt to the commercial fishery is possible which results in an initial commercial quota of 2,139 mt and an initial recreational harvest limit of 6,113 mt (Table 2).

RSA deduction and Adjusted RHL and Commercial Quota

An adjustment allowing for research projects to utilize up to 3% of bluefish TAL may be specified for 2015. The reduction from the TALs (total = 247 mt) for RSA results in an adjusted commercial quota of 2,074 mt and an adjusted recreational harvest limit of 5,930 mt. Note the marked reduction in the commercial quota for 2015 compared to previous years (Table 3a and 3b). This quota is the maximum that can be achieved given continued reductions in B/BMSY.

Gear Regulations and Minimum Fish Size

There was unanimous support among Advisors who participated in the July 11, 2014 Bluefish Advisory Panel meeting for reduction of the current 15 fish recreational bag limit. Catch and landings frequencies (Figure 5) suggest minimal impact on anglers if the recreational bag limit were to be reduced to 10 fish and a reduced bag limit would be more in keeping with state-specified bag limits. Staff recommends a 10 fish recreational bag limit for 2015.

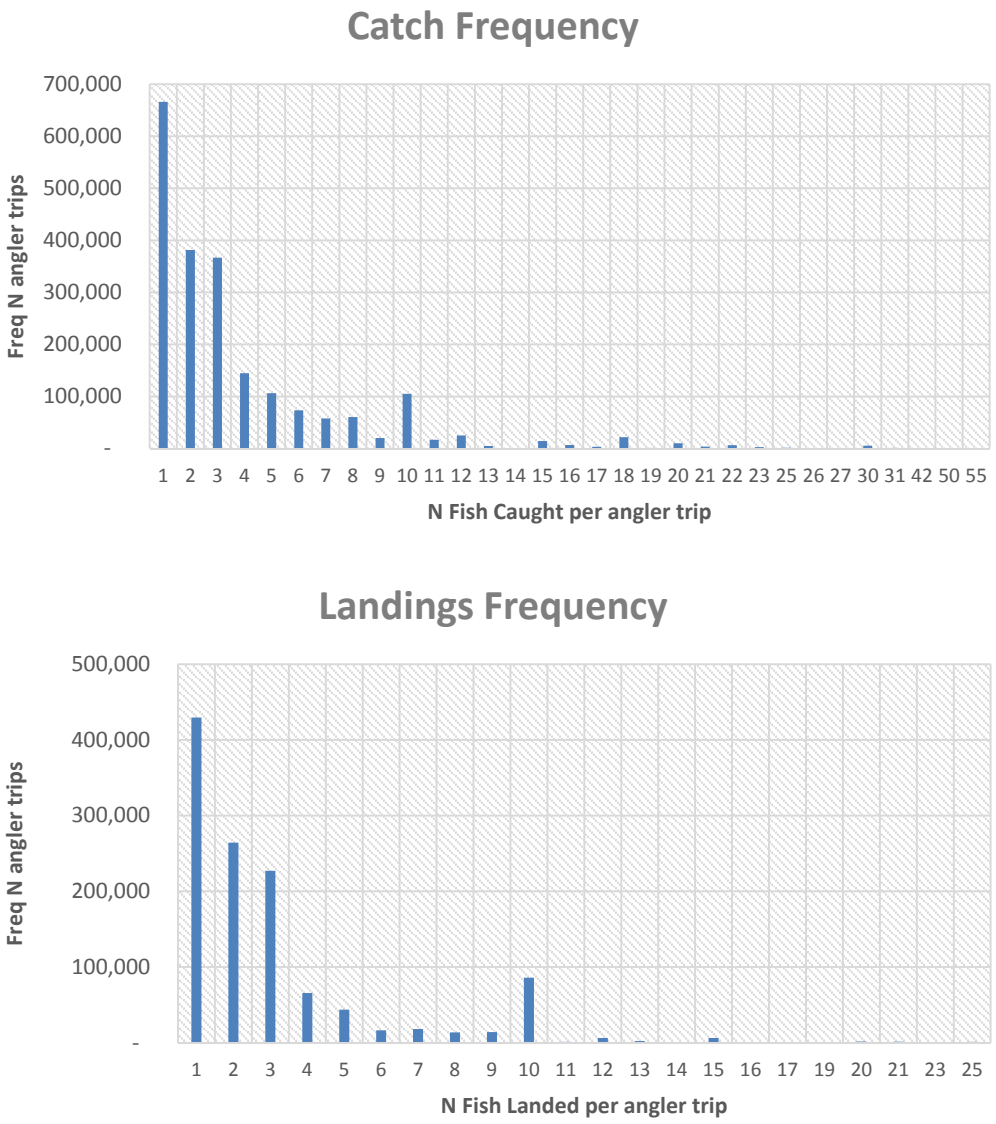

Figure 5. Catch (top) and landings (bottom) frequencies for recreationally caught bluefish in 2013. (Source: Scott Steinback NEFSC; MRIP)

Table 3a. Summary of bluefish management measures, 2000 – 2014 and proposed 2015. (Values are in mt)

Management Measures	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TAC[1]/ **ABC**[2] (M lb)	n/a	n/a	13,200	17,917	15,520	15,520	13,222	14,530	14,464	15,459	15,593	14,399	14,535	12,461	11,082	9,772
TAL (M lb)[3]	16,025	17,164	12,186	16,916	14,447	13,995	11,248	12,593	12,771	13,316	13,274	12,380	12,822	10,823	9,562	8,252
Comm. Quota (M lb)[4]	4,347	4,347	4,763	4,763	4,763	4,763	3,665	3,941	3,495	4,458	4,633	4,252	4,680	4,117	3,297	2,074
Comm. Landings (M lb)	3,647	3,945	3,116	3,358	3,647	3,187	2,926	3,267	2,585	3,151	3,206	2,455	2,236	1,961	-	-
Rec. Harvest Limit[4]	11,678	12,818	7,423	12,153	9,684	9,232	7,583	8,651	9,276	8,858	8,451	8,080	7,918	6,382	5,978	5,930
Rec. Landings (M lb)	4,811	6,001	5,158	5,958	7,179	8,225	7,663	9,608	8,573	6,161	8,184	5,965	4,846	6,980	-	
Rec. Possession Limit	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	*10*
Total Landings	8,458	9,946	8,274	9,316	10,826	11,412	10,589	12,874	11,158	9,312	11,390	8,420	7,082	8,941	-	-
Overage/Underage (M lb)	-7,567	-7,218	-3,912	-7,600	-3,621	-2,583	-659	282	-1,613	-4,003	-1,884	-3,960	-5,739	-1,882	-	-
Total Catch (M lb)	10,132	11,803	9,721	10,647	12,587	13,327	12,449	15,527	13,601	10,273	13,799	11,276	9,465	11,222	-	-
Overage/Underage (M lb)			-3,478	-7,270	-2,933	-2,192	-773	997	-863	-5,186	-1,793	-3,123	-5,070	-1,239	-	-
ASAP F estimate	0.133	0.17	0.127	0.131	0.164	0.145	0.136	0.163	0.132	0.097	0.141	0.114	0.097	0.118	-	-

[1] through 2011
[2] 2012 fwd.
[3] not adjusted for RSA
[4] adjusted downward for RSA

Table 3b. Summary of bluefish management measures, 2000 – 2014 and proposed 2015. (Values are in M lb)

Management Measures	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
TAC[1]/ **ABC**[2] (M lb)	n/a	n/a	29.1	39.5	34.215	34.215	29.15	32.033	31.887	34.081	34.376	31.744	**32.044**	**27.472**	**24.432**	***21.543***
TAL (M lb)[3]	35.328	37.841	26.866	37.293	31.85	30.853	24.797	27.762	28.156	29.356	29.264	27.293	28.267	23.861	21.081	*18.193*
Comm. Quota (M lb)[4]	9.583	9.583	10.5	10.5	10.5	10.5	8.081	8.689	7.705	9.828	10.213	9.375	10.317	9.076	7.269	*4.573*
Comm. Landings (M lb)	8.041	8.688	6.863	7.401	7.994	7.045	6.955	7.499	5.968	6.99	7.069	5.082	4.93	4.114	-	-
Rec. Harvest Limit (M lb)[4]	25.745	28.258	16.365	26.793	21.35	20.353	16.718	19.073	20.451	19.528	18.631	17.813	17.457	14.069	13.179	*13.073*
Rec. Landings (M lb)	10.606	13.23	11.371	13.136	15.203	16.162	16.894	21.163	18.9	13.583	18.042	11.499	10.684	15.281	-	
Rec. Possession Limit (N)	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	*10*
Total Landings (M lb)	18.647	21.918	18.234	20.537	23.197	23.207	23.849	28.662	24.868	20.573	25.111	16.581	15.614	19.395	-	-
Overage/Underage (M lb)	-16.681	-15.923	-8.632	-16.756	-8.653	-7.646	-0.948	0.9	-3.288	-8.826	-4.153	-10.712	-12.653	-4.466	-	-
Total Catch (M lb)	22.338	26.022	21.432	23.473	27.749	29.382	27.445	34.232	29.985	22.647	30.422	24.859	20.868	24.74	-	-
Overage/Underage (M lb)			-7.668	-16.027	-6.466	-4.833	-1.705	2.199	-1.902	-11.434	-3.954	-6.885	-11.176	-2.732	-	-
ASAP F estimate	0.133	0.170	0.127	0.131	0.164	0.145	0.136	0.163	0.132	0.097	0.141	0.114	0.097	0.118	-	-

[1] through 2011
[2] 2012 fwd.
[3] not adjusted for RSA
[4] adjusted downward for RSA