



Mid-Atlantic Fishery Management Council
800 North State Street, Suite 201, Dover, DE 19901
Phone: 302-674-2331 | FAX: 302-674-5399 | www.mafmc.org
Michael P. Luisi, Chairman | P. Weston Townsend, Vice Chairman
Christopher M. Moore, Ph.D., Executive Director

MEMORANDUM

Date: July 28, 2022
To: Council and Board
From: Kiley Dancy, Staff
Subject: Summer Flounder 2023 Specifications

On Tuesday, August 9, the Council and Board will review previously adopted 2023 summer flounder specifications and recommend revisions as needed. Measures to be considered include 2023 commercial and recreational catch and landings limits, as well as any changes to the commercial management measures needed for 2023. As described in the staff memo, previously approved 2023 commercial and recreational catch and landings limits will require revisions based on recent modifications to the commercial/recreational allocation percentages.

Materials listed below are provided for the Council and Board's consideration of this agenda item. As noted below, some materials are behind other tabs, and some will be available on the [August 2022 Meeting Page](#) at a later date.

- 1) Monitoring Committee meeting summary from July 28, 2022 (*to be posted on the [meeting page](#) once available*)
- 2) July 2022 Scientific and Statistical Committee meeting report (*to be posted behind Tab 15 once available*)
- 3) Staff memo on 2023 summer flounder specifications dated July 14, 2022
- 4) June 2022 Advisory Panel Fishery Performance Report and additional AP email comments received through July 8, 2021
- 5) 2022 Summer Flounder Data Update
- 6) 2022 Summer Flounder Fishery Information Document

The following document is also posted on the [August 2022 Meeting Page](#) as a supplemental briefing document:

- 1) Summer Flounder Management Track Assessment for 2021



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

MEMORANDUM

DATE: July 14, 2022

TO: Chris Moore, Executive Director

FROM: Kiley Dancy, Staff

SUBJECT: Summer Flounder Specifications for 2023

Executive Summary

This memorandum includes information to assist the Mid-Atlantic Fishery Management Council's (Council's) Scientific and Statistical Committee (SSC) and Monitoring Committee (MC) in reviewing the previously adopted 2023 catch and landings limits for summer flounder, as well as summer flounder commercial management measures for 2023. Additional information on fishery performance and past management measures can be found in the 2022 Summer Flounder Fishery Information Document and the 2022 Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report developed by advisors.¹

The Magnuson-Stevens Act requires the Council's SSC to provide ongoing scientific advice for fishery management decisions, including recommendations for Acceptable Biological Catch limits (ABCs), 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.

The 2021 stock assessment update indicated that the summer flounder stock was not overfished and overfishing was not occurring in 2019. In July 2021, the SSC provided recommendations for both varying and averaged two-year ABCs for 2022-2023 based on a management track stock assessment for summer flounder using data through 2019.²

In August 2021, the Council and the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass Board (Board) approved constant catch and landings limits for 2022-2023 based on the two-year averaging approach. The final 2022 specifications and projected 2023 specifications were published in the Federal Register on December 23, 2021 (86 FR 72859).

¹ Available at: <https://www.mafmc.org/fishery-performance-reports>.

² Available at https://apps-nefsc.fisheries.noaa.gov/saw/sasi/uploads/2021_summer_flounder_MTA_report.pdf.

The SSC should review the previously adopted 2023 ABC to consider if changes are needed. Staff recommend no changes to the 2023 ABC of 33.12 million pounds (15,021 mt) as there is no new information to suggest a change is needed.

Following the SSC's consideration of the 2023 ABC, the Monitoring Committee should review previously adopted 2023 sector specific catch and landings limits including the commercial and recreational Annual Catch Limits (ACLs) and Annual Catch Targets (ACTs), commercial quota, and recreational harvest limit (RHL) (Table 1). These values will require revisions based on modifications to the commercial/recreational allocation percentages approved by the Council and Board in December 2021 and pending implementation for 2023. The staff recommendations for revised 2023 sector specific limits are described in more detail in the "Sector-Specific Catch and Landings Limits" section of this memo and are summarized in Table 1.

The Monitoring Committee should also consider whether any revisions are needed to the commercial management measures which can be modified through the annual specifications process (minimum fish size, minimum mesh size, and mesh exemption programs). Recreational measures for 2023 will be considered later in 2022. Staff recommend no changes to the commercial minimum size, minimum mesh size, or mesh exemption programs for 2023. As described below in the "Commercial Management Measures" section, staff continue to recommend further evaluation of potential changes to the commercial minimum mesh size and exemption programs in a future year, likely following the development of other ongoing actions for this Fishery Management Plan (FMP) given limited current staff capacity.

Table 1: Previously approved 2022-2023 catch and landings limits for summer flounder as well as staff recommended revisions for 2023. The final 2023 values may differ based on the recommendations of the SSC, Monitoring Committee, Council, and Board. *(Revised 7/27/22 to correct error in 2022-2023 commercial discards)*

Measure	2022-2023		Basis	2023 Staff Rec.		Basis
	mil lb	mt		mil lb	mt	
OFL	36.28 (2022) 34.98 (2023)	16,458 (2022) 15,865 (2023)	Stock assessment projections	34.98	15,865	Stock assessment projections
ABC	33.12	15,021	July 2021 SSC recommendation	33.12	15,021	July 2021 SSC recommendation (staff rec. no changes to previous ABC)
ABC landings	25.89	11,743	ABC projections provided by the NEFSC; averaged 2022-2023 expected landings	NA	NA	Not needed under new catch-based allocation
ABC dead discards	7.23	3,279	ABC projections provided by the NEFSC; averaged 2022-2023	7.23	3,279	Same basis as previously approved.
Com. ACL	18.48	8,382	60% of ABC landings portion (current FMP allocation) + expected comm. dead discards	18.21	8,262	55% of ABC (revised commercial allocation)
Com. ACT	18.48	8,382	No deduction from ACL for management uncertainty	18.21	8,262	Staff rec: Same basis as previously approved.
Expected com. dead discards	2.95	1,336	59% of ABC dead discards portion, based on 2017-2019 average % dead discards by sector	2.95	1,336	Staff rec: Same basis as previously approved.
Com. quota	15.53	7,046	Comm. ACT, minus expected comm. dead discards	15.27	6,925	Same basis as previously approved.
Rec. ACL	14.64	6,639	40% of ABC landings portion (FMP allocation) + expected rec. dead discards	14.90	6,759	45% of ABC (revised recreational allocation)
Rec. ACT	14.64	6,639	No deduction from ACL for management uncertainty	14.90	6,759	Staff rec: Same basis as previously approved.
Expected rec. dead discards	4.28	1,942	59% of ABC dead discards portion, based on 2017-2019 average % dead discards by sector	4.28	1,942	Staff rec: Same basis as previously approved.
RHL	10.36	4,697	Rec. ACT minus expected rec. dead discards	10.62	4,817	Same basis as previously approved.

Stock Status and Biological Reference Points

In June 2021, the Northeast Fisheries Science Center (NEFSC) provided a management track assessment for summer flounder with data through 2019, based on and update to the model developed through the 66th Stock Assessment Workshop/Stock Assessment Review Committee (SAW/SARC) in 2018.

The 2021 management track assessment update made minor revisions to the biological reference points for spawning stock biomass and fishing mortality. The 2021 management track assessment results indicated that the summer flounder stock was not overfished and overfishing was not occurring in 2019. SSB has generally decreased since 2003 and was estimated to be 104.49 million lb (47,397 mt) in 2019, about 86% of the updated biomass target reference point $SSB_{MSY\ proxy} = 121.73$ million lb (55,217 mt). This estimate is 72% above the overfished threshold of $\frac{1}{2} SSB_{MSY\ proxy} = \frac{1}{2} SSB_{35\%} = 60.87$ million lb (27,609 mt; Figure 1; Table 2). There is a 90% chance that SSB in 2019 was between 42,000 and 54,000 mt.

Fishing mortality on the fully selected age 4 fish ranged between 0.744 and 1.622 during 1982-1996 and then decreased to 0.245 in 2007. Since 2007 the fishing mortality rate (F) has increased, and in 2019 was estimated at 0.340, 81% of the updated fishing mortality threshold reference point ($F_{MSY\ proxy} = F_{35\%} = 0.422$; Figure 2; Table 2). There is a 90% probability that the fishing mortality rate in 2019 was between 0.280 and 0.396.

The average recruitment from 1982 to 2019 is 53 million fish at age 0. Recruitment of juvenile summer flounder was below-average from 2011-2017, ranging from 31 to 45 million fish and averaging 36 million fish. The driving factors behind this period of below average recruitment have not been identified. The 2018 year class is above average at an estimated 61 million fish, which is largest recruitment estimate since 2009, while the 2019 year class is below average at 49 million fish.

A data update provided by the NEFSC in July 2022 indicates that the NEFSC spring survey index of summer flounder stock biomass decreased by 41% from 2019 to 2022, and the fall index increased by 6% from 2019 to 2021. No surveys were conducted in 2020. The NEFSC fall survey length frequency distributions support the conclusion that an above average year class recruited to the stock in 2018 with average to below average recruitment since.³

The Northeast Regional Coordinating Council (NRCC)'s stock assessment process⁴ now has summer flounder receiving management track assessments every two years. The next management track assessment is expected in 2023 to inform 2024-2025 limits.

³ Summer Flounder Data Update for 2022 provided by the Northeast Fisheries Science Center. Available at <https://www.mafmc.org/ssc-meetings/2022/july-25-26>

⁴ <http://www.mafmc.org/s/Stock-assessment-process-FINAL.pdf>.

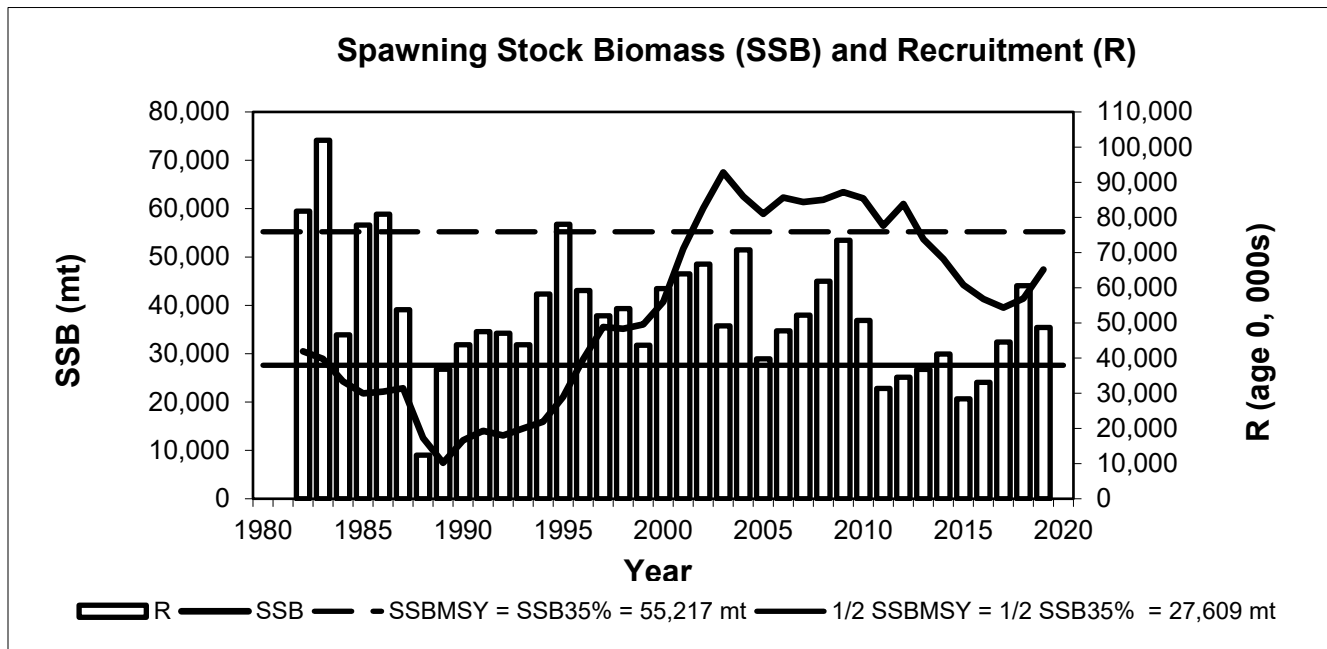


Figure 1: Summer flounder spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars), 1982-2019. The horizontal dashed line is the updated target biomass reference point. The horizontal solid line is the updated threshold biomass reference point. Source: 2021 management track assessment.

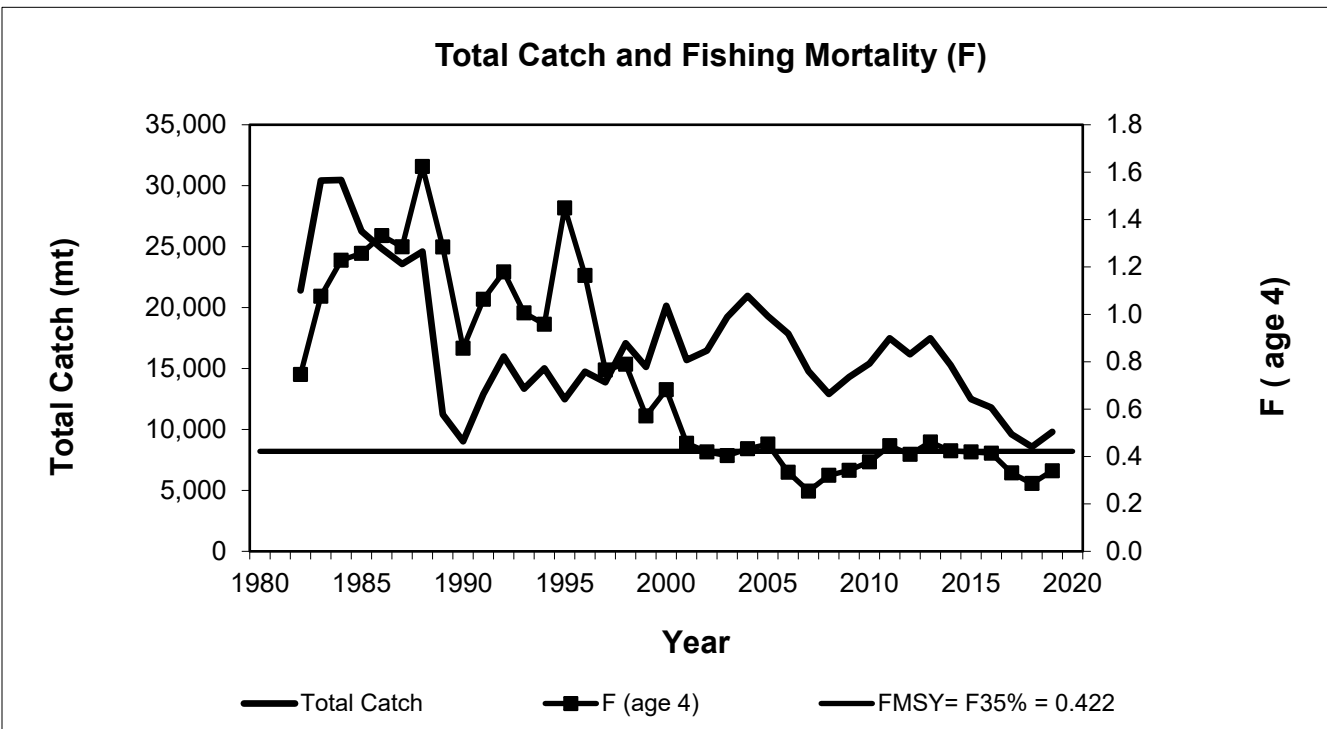


Figure 2: Total fishery catch (metric tons; mt; solid line) and fully-recruited fishing mortality (F, peak at age 4; squares) of summer flounder, 1982-2019. The horizontal solid line is the updated fishing mortality reference point. Source: 2021 management track assessment.

Table 2: Biomass and fishing mortality rate reference points and terminal year estimates for summer flounder from the 2021 management track assessment.

	Spawning stock biomass	Fishing mortality rate (F)
Terminal year estimate (2019)	104.49 million lb (47,397 mt)	0.340
Target	121.73 mil lb (55,217 mt)	N/A
Threshold	60.87 million lb (27,609 mt)	0.422
Status	Not overfished	Not overfishing

Recent Catch and Fishery Performance

Commercial landings in 2021 were approximately 10.36 million pounds (4,699 mt), about 83% of the commercial quota of 12.49 million pounds (5,663 mt). Commercial dead discard estimates are not currently available for 2021 due to delays in observer data processing for 2021. As such, it is not currently possible to evaluate 2021 commercial catch against the commercial ACL.

The recreational harvest was estimated at approximately 6.82 million pounds (3,093 mt) in 2021, about 82% of the 2021 RHL of 8.32 million pounds. This is the second lowest estimate of recreational harvest in the time series going back to 1981, with the lowest being 5.66 million pounds harvested in 1989. Recreational dead discard estimates in weight are not yet available for 2021.

The commercial fishery has underharvested their quota since 2018 (Table 3). The larger underages since 2019 (18-21%) are likely due in large part to a substantial increase in quota starting in mid-2019, with possible additional influence from market factors related to COVID-19. Performance of commercial dead discards relative to projected discard levels has been variable, with 2017 and 2018 seeing higher than expected discards, leading to ACL overages (19% and 8% ACL overages in 2017 and 2018, respectively). In those years, commercial ACLs were well below average, and it is likely that discard projections did not include appropriate consideration for the effects of below average landings limits. In 2019, commercial catch was 20% below the ACL. There are no discard estimates currently available to evaluate total commercial catch in 2020 or 2021, but given the performance of landings relative to the quota, it is unlikely that ACLs were exceeded in these years (Table 3).

Recreational fishery performance relative to RHLs through 2018 cannot be evaluated using the revised MRIP data, since past RHLs were set based on assessments that used the old data. A performance evaluation for 2012-2021 using old or new MRIP data, depending on the year, is provided in Table 4. Recreational performance has been variable relative to the RHLs given the difficulty in forecasting recreational effort and catch rates in any given year, as well as the lack of timely in-season data and in-season closure authority for the recreational fishery. Recreational harvest has been below the RHL in three of the last five years (2017 and 2018). In 2021, harvest was estimated to be 6.82 million pounds, the second lowest harvest estimate in the time series going back to 1981, and 18% below the 2021 RHL of 8.32 million pounds. Recreational catch has generally been below the recreational ACL since 2012 (calculated in old MRIP units through 2018), with the exception of 4% and 12% overages in 2014 and 2016, respectively (Table 4).

Table 3: Summer flounder commercial landings, dead discards, and dead catch compared to the commercial quota, projected commercial dead discards, and commercial ACL, 2012-2021. ACLs for summer flounder were first used starting in 2012. All values are in millions of pounds.

Year	Com. Landings ^a	Com. quota ^c	Quota overage/underage	Com. dead discards ^{a,b}	Projected com. dead discards ^c	Projected dead discards overage/underage	Com. dead catch ^{a,b}	ACL	ACL overage/underage ^b
2012	13.05	13.14	-1%	1.66	0.46	261%	14.71	14.00	5%
2013	12.56	11.44	10%	1.90	0.33	477%	14.46	12.11	19%
2014	11.00	10.51	5%	1.83	2.03	-10%	12.83	12.87	0%
2015	10.71	11.07	-3%	1.55	2.27	-32%	12.26	13.34	-8%
2016	7.80	8.12	-4%	1.70	1.31	30%	9.50	9.43	1%
2017	5.83	5.66	3%	2.00	0.92	117%	7.83	6.57	19%
2018	6.14	6.63	-7%	2.20	1.07	105%	8.34	7.70	8%
2019	9.05	10.98	-18%	1.73	2.00	-14%	10.79	13.53	-20%
2020	9.11	11.53	-21%	--	2.00	--	--	13.53	--
2021	10.36	12.49	-17%	--	2.14	--	--	18.48	--

^a Based on NEFSC data provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

^b Dead discards for 2020 and 2021 are not yet available.

^c From past staff memos, specifications documents, and *Federal Register* notices. The commercial quotas shown for 2012-2014 reflect a 3% deduction for Research Set Aside (RSA).

Table 4: Summer flounder recreational landings, dead discards, and dead catch compared to the RHL, projected recreational dead discards, and recreational ACL, 2012-2021. ACLs for summer flounder were first used starting in 2012. Values are provided in the “old” and “new” MRIP units where available as the ACLs and RHLs did not account for the revised MRIP data until 2019. Therefore, overage/underage evaluations must be based in the old MRIP units through 2018 and the new MRIP units starting in 2019. Old MRIP values and performance calculations are highlighted with italics. All values are in millions of pounds.

Year	Rec. land. OLD MRIP ^a	Rec. land. NEW MRIP ^c	RHL ^e	RHL over/under ^d	Rec. dead disc. old MRIP units ^{a,b}	Rec. dead disc. new MRIP units ^b	Proj. rec. dead disc. ^e	Projected dead disc. over/under ^c	Rec. dead catch OLD MRIP ^a	Rec. dead catch NEW MRIP ^{c,d}	Rec ACL	Rec ACL over/under ^d
2012	<i>6.49</i>	16.13	8.76	-26%	<i>1.80</i>	4.79	2.55	-30%	8.29	20.92	11.58	-28%
2013	<i>7.36</i>	19.41	7.63	-4%	<i>1.67</i>	4.67	2.37	-29%	9.03	24.08	10.23	-12%
2014	<i>7.39</i>	16.23	7.01	5%	<i>2.05</i>	4.61	1.84	12%	9.44	20.84	9.07	4%
2015	<i>4.72</i>	11.83	7.38	-36%	<i>1.24</i>	3.47	2.06	-40%	5.96	15.30	9.44	-37%
2016	<i>6.18</i>	13.24	5.42	14%	<i>1.48</i>	3.27	1.41	5%	7.66	16.51	6.84	12%
2017	<i>3.19</i>	10.09	3.77	-15%	<i>0.94</i>	3.30	0.95	-1%	4.13	13.39	4.72	-13%
2018	<i>3.35</i>	7.60	4.42	-24%	<i>0.97</i>	2.21	1.11	-13%	4.32	9.81	5.53	-22%
2019	NA	7.80	7.69	1%	NA	3.04	3.82	-20%	NA	10.84	11.51	-6%
2020	NA	10.06	7.69	31%	NA	--	3.82	--	NA	--	11.51	--
2021	NA	6.82	8.32	-18%	NA	--	4.16	--	NA	--	12.48	--

^a Based on the data update provided by the NEFSC in 2018 (most recent data from NEFSC in “old” MRIP units). Values for 2018 provided by GARFO.

^b Dead discards for 2020 and 2021 are not yet available due to data issues associated with COVID-19 and delays in processing commercial observer data.

^c Based on NEFSC data as provided in 2021 management track assessment (data through 2019) and 2022 data update (2020 and 2021 values).

^d Based on a comparison with old MRIP data through 2018 and new MRIP data starting in 2019.

^e From past staff memos, specifications documents, and *Federal Register* notices. The RHLs shown for 2012-2014 reflect a 3% deduction for Research Set Aside (RSA).

The 2022 commercial landings as of July 6, 2022, indicate that 39% of the 2022 coastwide commercial quota has been landed.⁵ As of this memo, recreational harvest estimates for 2022 are only available through wave 2 (March/April), which does not provide meaningful information about 2022 recreational harvest trends for summer flounder given that in recent years wave 2 has accounted for less than 1% of annual summer flounder harvest.

Review of Prior SSC Recommendations

In July 2021, as requested by the Council, the SSC recommended two alternative sets of two-year ABC recommendations based on the information and projections from the 2021 management track assessment: one with varying ABCs each year, and one with a constant ABC across 2022-2023.

The SSC indicated that the approach to estimating uncertainty in the OFL had not changed since the previous benchmark (SAW/SARC 66 in 2018). Accordingly, the SSC maintained its determination that the assessment should be assigned an “SSC-modified OFL probability distribution.” In this type of assessment, the SSC provides its own estimate of uncertainty in the distribution of the OFL.

The SSC continued the application of a 60% OFL coefficient of variation (CV), because: (1) the latest management track assessment did not result in major changes to the quality of the data and model that the SSC has previously determined to meet the criteria for a 60% CV; (2) the summer flounder assessment continues to be a data rich assessment with many fishery independent surveys incorporated and with relatively good precision of the fishery dependent data; (3) several different models and model configurations were considered and evaluated by SAW-66, most of which showed similar stock trends and stock status; and (4) no major persistent retrospective patterns were identified in the most recent model. The SSC noted that significant improvements in quality of data and investigations of alternate model structures affirm the specification of the 60% OFL CV by the SSC.

The SSC accepted the OFL proxy ($F_{35\%} = 0.422$) used in the management track assessment. Given recent trends in recruitment for summer flounder, the SSC recommended the use of the most recent 9-year recruitment series for OFL projections (2011-2019) because near-term future conditions were more likely to reflect recent recruitment patterns than those in the entire 38-year time series.

The SSC considered the following to be the most significant sources of uncertainty associated with the determination of the OFL and/or ABC:

- Changes in life history are apparent in the population; for example, declining growth rates and differences in sex-specific age structure.
- Uncertainty regarding recreational catch and discard estimates from MRIP, especially for 2020 where some data were imputed.
- Potential changes in productivity of the stock, which may affect estimates of biological reference points. Changes in size-at-age, growth, and recruitment may be environmentally mediated, but mechanisms are unknown.
- Potential changes in availability of fish to some surveys and to the fishery as a result of changes in the distribution of the population.

Table 5 shows the SSC recommended 2022-2023 ABCs along with the associated OFLs and P* values. In August 2021, the Council and Board ultimately adopted the SSC-recommended ABCs based on the

⁵ Based on data available at <https://www.fisheries.noaa.gov/new-england-mid-atlantic/commercial-fishing/quota-monitoring-greater-atlantic-region>

two-year averaged approach, implementing a constant ABC of 33.12 million pounds (15,021 mt) in each year 2022-2023.

Table 5: SSC-recommended 2022-2023 OFLs, ABCs, and P* values for the variable and averaged ABC approaches.

Variable ABCs			
Year	OFL	ABC	P*
2022	36.28 mil lb 16,458 mt	33.96 mil lb 15,403 mt	0.452
2023	34.74 mil lb 15,759 mt	32.27 mil lb 14,639 mt	0.447
Averaged ABCs^a			
Year	OFL	ABC	P*
2022	36.28 mil lb 16,458 mt	33.12 mil lb 15,021 mt	0.435
2023	34.98 mil lb 15,865 mt		0.461

^a Reflects currently approved ABCs adopted by Council and Board in August 2021.

Staff Recommendation for 2023 ABC

Staff recommend maintaining the previously adopted ABC for summer flounder of 2023 ABC of 33.12 million pounds (15,021 mt). The 2022 data update indicates little evidence to suggest that stock condition has changed substantially from what was indicated in the 2021 management track assessment.

Recent Management Actions

The following sections briefly summarize recent management actions that should be considered during the discussion of sector-specific catch and landings limits for 2023.

Commercial/Recreational Allocation Revisions

In December 2021, the Council and Commission revised the summer flounder commercial/ recreational allocation such that 55% of the ABC will be allocated to the commercial fishery and 45% to the recreational fishery.⁶ Under the previous allocation, 60% of the amount of the landings portion of the ABC was allocated to the commercial fishery and 40% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation. The allocation will now be applied directly to the ABC. Figure 3 illustrates the differences in how specifications will be set under the revised catch-based allocation compared to the previous landings-based allocation.

The revised and previous allocations are not directly comparable due to the change from a landings-based to a catch-based allocation. However, as illustrated by the recommended specifications shown Table 1, the revised allocations are expected to slightly increase the recreational ACL and RHL and slightly decrease the commercial ACL and quota compared to the previous allocations.

The allocation revisions are pending review by NMFS and if approved, are expected to be effective January 1, 2023. Therefore, the Monitoring Committee should recommend 2023 commercial and recreational ACLs, and other specifications that derive from the ACLs, based on the revised allocation.

⁶ <http://www.mafmc.org/actions/sfsbsb-allocation-amendment>

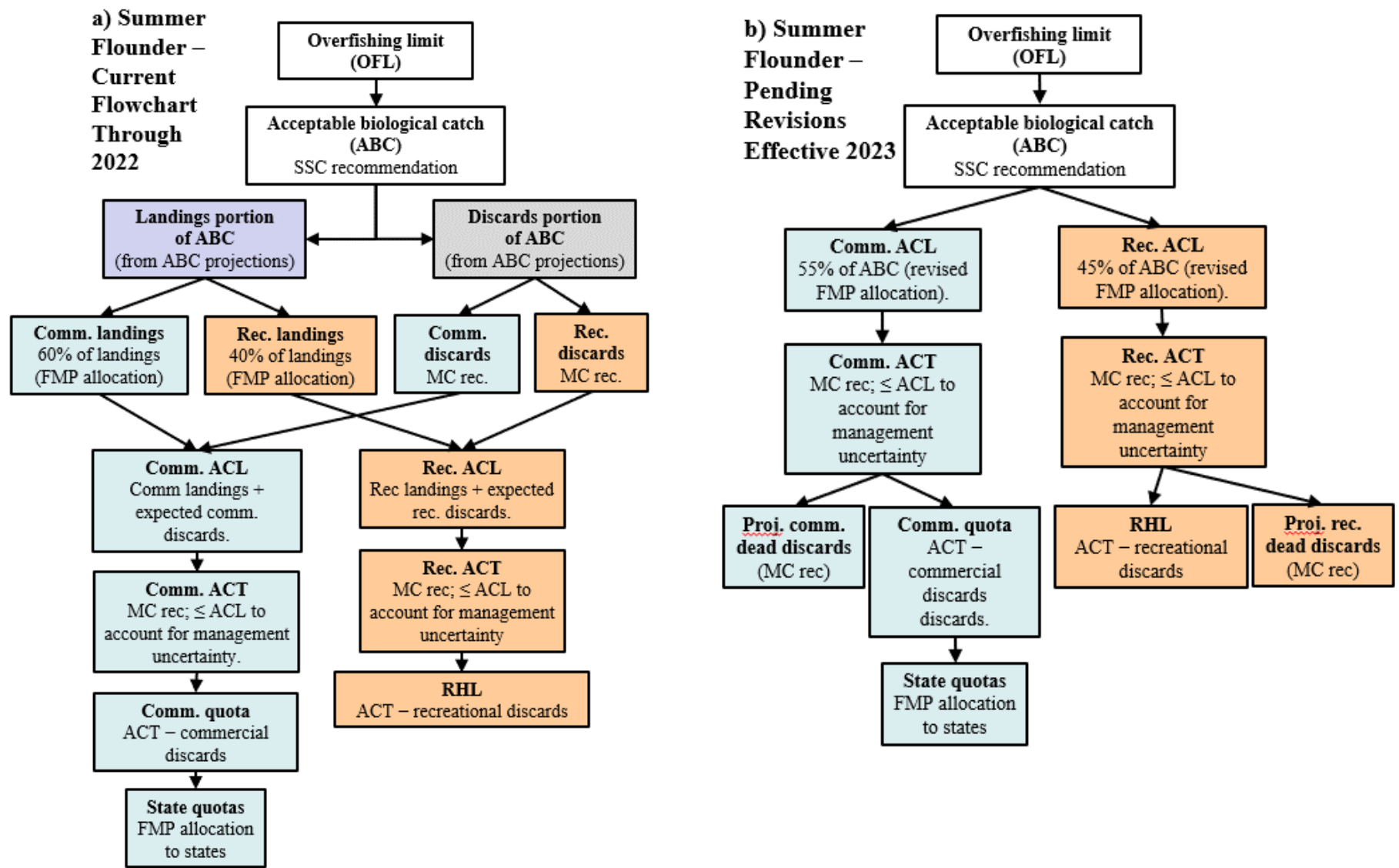


Figure 3: Flowcharts for summer flounder catch and landings limits based on a) the process through 2022, and b) pending revisions to the commercial/recreational allocations.

Recreational Harvest Control Rule Framework/Addenda

In June 2022, the Council and the Commission's Interstate Fishery Management Program Policy Board took final action on the Recreational Harvest Control Rule Framework/Addenda, with the goal of using a new approach, called the Percent Change Approach, to set recreational measures for summer flounder, scup, and black sea bass starting in 2023. Under the Percent Change Approach, recreational measures will not be tied as closely to an RHL (or, by extension, an ACL) as previously required. Instead, the target harvest level will vary based on a comparison of a confidence interval around expected harvest under status quo measures to the upcoming two-year average RHL, as well as biomass compared to the biomass target. This approach will allow for RHL overages in some cases (and therefore, by extension, likely ACL overages) and underages in other cases.⁷

It is not possible to predict the target level of harvest for 2023 recreational measures because the 2023 RHL has not been set and calculations of expected harvest under status quo measures will not be finalized until later in 2022.

The Monitoring Committee should consider the implications of this approach when making recommendations for 2023 recreational specifications, including considerations related to management uncertainty and projected dead discards.

Sector-Specific Catch and Landings Limits

Recreational and Commercial Annual Catch Limits

Under the revised catch-based allocations described above, the commercial and recreational ACLs are calculated with a straightforward application of the revised allocation percentages to the 2023 ABC. If no changes are made to the previously adopted 2023 ABC of 33.12 million pounds, this would result in a 2023 commercial ACL of 18.21 million pounds (8,262 mt) and a recreational ACL of 14.90 million pounds (6,759 mt; Table 1).

Annual Catch Targets

ACTs are set less than or equal to the sector-specific ACLs to account for management uncertainty. 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 discards) or because of a lack of management precision (i.e., the ability to constrain catch to desired levels). The Monitoring Committee should consider all relevant sources of management uncertainty in the summer flounder fishery when recommending ACTs.

Consistent with the previously adopted 2023 measures, staff recommend that the commercial and recreational ACTs remain equal to their respective ACLs for 2023, such that no reduction in catch is taken for management uncertainty.

As noted by the MC when originally recommending 2023 specifications, commercial fishery landings are well controlled with in-season closure authority and commercial quota monitoring systems which

⁷ For more details on the Percent Change Approach, see <https://www.mafmc.org/newsfeed/2022/mafmc-amp-asmfc-take-first-step-toward-recreational-management-reform-for-bluefish-sumer-flounder-scup-and-black-sea-bass>

typically allow timely reactions to landings levels that approach quotas. The commercial fishery has underharvested their quota since 2018, more notably since 2019 when quotas were increased mid-year by approximately 50% (Table 3). Commercial dead discards estimates are only available through 2019. The Monitoring Committee had previously recommended closely monitoring commercial discards trends due to discards-driven overages of the commercial ACL in 2017 and 2018; however, in these years, a large proportion of discards were likely the result of below-average quotas. Observer data for observed trawl hauls from 2015-2019 support this conclusion (Table 6). Commercial discards decreased to below projected levels in 2019, possibly due in part to increased quotas, as commercial discards for summer flounder tend to decrease within increasing catch limits.

Table 6: Percent of observed bottom otter trawl hauls with discarded summer flounder by discard reason, 2015-2019. Complete observer data are not available for 2020 or 2021.

Recorded Discard Reason	2015	2016	2017	2018	2019	Average
Too small	56.7%	50.9%	37.4%	45.6%	62.8%	50.7%
No Quota	31.9%	37.3%	49.9%	42.3%	27.1%	37.7%
High graded	4.4%	7.4%	7.2%	7.1%	6.4%	6.5%
Market reasons (unknown, will spoil, poor quality, too large)	7.0%	4.3%	5.3%	4.8%	3.7%	5.0%

Recreational fishery performance relative to recreational ACLs and RHLs has been more variable, but generally near or below these limits since 2017, with the exception of a 31% RHL overage in 2020. As previously noted, 2021 harvest was estimated to be below average and 18% below the 2021 RHL. As previously described, the impact of the Percent Change Approach on recreational summer flounder measures in 2023 is not yet known, and it is not possible to accurately evaluate the likelihood of this approach resulting in differences in recreational fishery performance compared to the RHL or ACL compared to recent trends.

Based on these considerations, staff do not believe there is new information to support a deviation from the MC’s previous recommendation of ACL=ACT for 2023.

Projected Dead Discards, Commercial Quotas and Recreational Harvest Limits

The MC should recommend projected discards for each sector, to be removed from the sector-specific ACTs to derive the commercial quota and RHL (Figure 3). This recommendation will likely need to rely on discard data through 2019, as estimates for 2020 and 2021 are not currently available as of the completion of this memo.

The previous landings-based allocation (through 2022) has required first separating the ABC into total expected discards and landings, and applying the FMP allocation percentages to the landings portion of the ABC (which for summer flounder has typically been provided by the NEFSC with ABC projections). Typically, discards have been apportioned based on a 3-year moving average of the proportion of discards from each sector, applied to the total projected discards for the upcoming fishing year(s).

Under the pending catch-based allocation, the MC could consider different approaches to recommending sector specific discards. Staff have considered several options, including:

- An approach similar to current methods, where total projected dead discards provided by NEFSC are split into expected commercial and recreational dead discards based on a moving 3-year

average of the proportion of dead discards by sector. These projected sector discards are then removed from the sector-specific ACTs.

- A linear regression approach examining sector dead discards as a function of sector catch, ACLs, or landings. These approaches were used to develop example landings limits during the development of the commercial/recreational allocation amendment. While this would provide a systematic, data driven approach to estimating discards, the correlations associated with the regressions examined for summer flounder to date are not very strong.
- A simple moving average (3-year or other time frame) of discards in pounds for each sector. This approach has the advantage of being straightforward and reflective of recent fishery trends, but it may be problematic in situations where fishery conditions (stock status, catch limits, availability, etc.) change notably over the relevant time frame. For 2023, staff does not recommend this approach (which would use 2017-2019 discard data) because catch limits in 2017 and 2018 were much lower than current levels, and the fishery was under notably different constraints and regulations than are expected for 2023. Additionally, an above average 2018 year class has been observed that was largely not reflected in discard estimates through 2019.

Staff recommend that for 2023, sector discards continue to be calculated by applying the 3-year moving average proportion of discards by sector to total projected dead discards. This approach relies on projections of total discards from the NEFSC which account for age structure of the population. Because dead discard estimates are not available for 2020 or 2021, the most recent 3-year time frame to calculate the proportion of discards by sector remains 2017-2019. Over this time period, 59% of dead discards came from the recreational fishery and 41% from the commercial fishery. Applying this to the total 2023 projected dead discards of 7.23 million pounds (3,279 mt), resulting projected commercial dead discards are 2.95 million pounds (1,336 mt) and projected recreational dead discards are 4.28 million pounds (1,942 million pounds). These are the same projections of dead discards that were applied to the previously adopted 2023 specifications (Table 1). When comparing these projections to recent estimates of discards through 2019, it's possible that this method may overpredict discards. However, this may not ultimately be the case as the full impacts of higher landings limits since 2019 and of the large 2018 year class on discards are yet to be seen given the lack of data since 2019.

These discard projections result in a staff-recommended commercial quota of 15.27 million pounds (6,925 mt) and an RHL of 10.62 million pounds (4,817 mt) (Table 1). These values represent a 1.7% decrease in the commercial quota and a 2.5% increase in the RHL compared to the previously adopted values for 2022-2023.

The commercial quota is divided among the states based on the allocation percentages specified in the FMP, and each state sets measures to achieve their state-specific commercial quotas (including but not limited to the measures described below that are required by the joint FMP). The commercial allocations to the states were modified via Amendment 21, which became effective on January 1, 2021. The revised allocation system modifies the state-by-state commercial quota allocations in years when the annual coastwide commercial quota exceeds the specified trigger of 9.55 million pounds. Annual coastwide commercial quota of up to 9.55 million pounds is distributed according to the previous state allocations. In years when the coastwide quota exceeds 9.55 million pounds, the *additional* quota amount beyond this trigger is distributed in equal shares to all states except Maine, Delaware, and New Hampshire, which split 1% of the additional quota (Table 7). The total percentage allocated annually to each state is dependent on how much additional quota beyond 9.55 million pounds, if any, is available in any given year. This allocation system is designed to provide for more equitable distribution of quota when biomass is relatively higher, while also considering the historic importance of the fishery to each state.

Table 7: Allocation of summer flounder commercial quota to the states (effective January 2021 via Amendment 21).

State	Total state allocation = baseline quota allocation + additional quota allocation	
	Allocation of baseline quota ≤9.55 mil lb	Allocation of <u>additional</u> quota <u>beyond</u> 9.55 mil lb
ME	0.04756%	0.333%
NH	0.00046%	0.333%
MA	6.82046%	12.375%
RI	15.68298%	12.375%
CT	2.25708%	12.375%
NY	7.64699%	12.375%
NJ	16.72499%	12.375%
DE	0.01779%	0.333%
MD	2.03910%	12.375%
VA	21.31676%	12.375%
NC	27.44584%	12.375%
Total	100%	100%

Commercial Management Measures

Commercial measures that can be modified during specifications are discussed in the sections below, including the commercial minimum fish size, gear regulations, minimum mesh sizes, and exemptions. These measures have remained generally constant since 1999.

Commercial Gear Regulations and Minimum Fish Size

The minimum fish size and mesh requirements may be changed through specifications based on the recommendations of the Monitoring Committee. The current commercial minimum fish size is 14 inches total length (TL) and has been in place since 1997. Current trawl gear regulations require a 5.5-inch diamond or 6.0-inch square minimum mesh in the entire net for vessels possessing more than the threshold amount of summer flounder, i.e., 200 lb in the winter (November 1-April 30) and 100 lb in the summer (May 1-October 31).

In September 2019, the Monitoring Committee discussed various mesh size issues for summer flounder, scup, and black sea bass, and revisited the 2018 mesh selectivity study for summer flounder, scup, and black sea bass by Hasbrouck et al. (2018)⁸. Hasbrouck et al. study suggests that, in general, the current minimum mesh sizes are effective at releasing catch of most undersized and immature fish, but modifications could be considered to allow for consistent mesh sizes for black sea bass and scup, and to potentially reduce discards of undersized summer flounder. As described in the meeting summary, the MC identified additional analyses and input needed from industry before recommending changes to the mesh size regulations.

For summer flounder, the MC had noted that the selectivity curve described in the study for 6.0" square mesh does not appear to be equivalent to that of the 5.5" diamond. Instead, the 6.0" square is much more similar to a 5.0" diamond mesh. The 6.0" square mesh releases less than 50% of minimum size fish. The

⁸ Hasbrouck et al. 2018 is available at: http://www.mafmc.org/s/Tab08_SFBSB-Mesh-Selectivity-Study-Apr2018.pdf. The Monitoring Committee discussion document from September 2019 is available at <https://www.mafmc.org/s/FSB-Mesh-Size-Issues-Overview-Sept-2019.pdf>, and the MC report from that discussion can be found at: https://www.mafmc.org/s/SFBSB_MC_Summary_Sept_2019_FINAL.pdf. T

MC had some concerns with the amount of undersized summer flounder caught with the 6.0" square mesh and recommended further exploring the impacts of this mesh size. Phasing out the use of 6.0" square mesh for summer flounder could reduce discards of undersized fish. The MC noted that further analysis should be done on how many vessels are currently using 6.0" square vs. 5.5" diamond mesh.

In recent discussions on this topic, the MC has been supportive of continuing to analyze this issue, but has also recognized that it should be a lower priority in the near term given other pressing management concerns for this FMP. The Council and Board have also agreed that while this issue should still be pursued, it has not been a near-term priority given other management activities. Staff will continue to work with the Monitoring Committee and Advisory Panel to further analyze and consider potential changes to mesh size regulations. However, given other workload constraints, it is not likely that additional work on this topic can be done in 2022. Staff recommend no changes to the current 14-inch minimum fish size, or seasonal possession thresholds triggering the minimum mesh size for 2023.

Minimum Mesh Size Exemption Programs

Small Mesh Exemption Area

Vessels landing more than 200 lb of summer flounder east of longitude 72° 30.0'W, from November 1 through April 30, and using mesh smaller than 5.5-inch diamond or 6.0-inch square are required to obtain a small mesh exemption program (SMEP) permit from NMFS. The exemption is designed to allow vessels to retain some bycatch of summer flounder while operating in other small-mesh fisheries.

The FMP requires that observer data be reviewed annually to determine whether vessels fishing seaward of the SMEP line with smaller than the required minimum mesh size and landing more than 200 lb of summer flounder are discarding more than 10% (by weight) of their summer flounder catch per trip. Typically, staff evaluate the Northeast Fisheries Observer Program (NEFOP) data for the period from November 1 in the previous year to April 30 in the current year. However, when this analysis is conducted each summer, complete observer data is not yet available through the end of April in the current year. As such, a year-long lag in the analysis is used.

Due to issues accessing observer data, staff have been unable to complete this analysis for the November 1, 2020-April 30, 2021 period. If data can be accessed prior to upcoming meetings, staff will provide the analysis as a supplemental document.

The most recent analysis includes examination of observer data from November 1, 2019 through approximately March 19, 2020.⁹ Last year, staff were unable to evaluate observer data from the full time period of November 1, 2019 through April 30, 2020 in given COVID related gaps in observer coverage in early 2020. For this time period, a total of 397 trips with at least one tow were observed east of 72° 30.0'W and 204 of these trips used small mesh (Table 8). Of those 204 trips, 97 trips (47%) reported landing more than 200 lb of summer flounder. Of those 97 trips, 24 trips (25%) discarded more than 10% of their summer flounder catch. The percentage of trips that met all these criteria relative to the total number of observed trips east of 72° 30.0'W is 6.0% (24/397 trips).

The number of vessels issued a letter of authorization (LOA) for the small mesh exemption program has remained relatively stable since 2013, fluctuating around an average of 67 vessels (Figure 4).

⁹ The observer requirement was first waived on March 20, 2020, although there are a few relevant observer records after this date, presumably from vessels which were already at sea.

The MC had previously identified concerns with an increased percentage in the number of observed trips in the small mesh exemption area landing over 200 pounds of summer flounder but discarding more than 10% of their summer flounder catch (Table 8). While the amount of observed discards from these trips is low relative to the commercial catch limit, because these observed trips are a subset of the fishery operating under this exemption, the actual extent of discards under the exemption program is not known. The MC has also noted that these increases in discards were possibly related to decreased commercial quotas, especially from 2017 through the first half of 2019, and that increases in quota since 2019 should reduce the rates of discarding in general, including under this exemption. General analysis of recorded discard reasons in the observer data (not specific to this exemption program) indicate that discards in recent years prior to 2019 have been more heavily driven by quota-related reasons, but in 2019 quota-related reasons accounted for a much smaller percentage of observed discards. The MC indicated that an analysis of the recorded discard reasons specifically for vessels operating under this exemption program would be useful in the future.

The MC should consider whether changes may be needed to this exemption program. Staff recommend no changes to this exemption program for 2023, but that it be more thoroughly evaluated for potential changes in a future year. Similar to the mesh size discussion above, additional work is unlikely on this issue in the near term due to other management priorities.

Table 8: Numbers of observed trips that meet specific criteria based on NEFOP data from November 1-April 30 for 2014 through 2020; observer data for 2020 is only available through mid-March due to the COVID-19 related suspension of the observer program.

Criteria		Nov. 1, 2014 – April 30, 2015	Nov. 1, 2015 – April 30, 2016	Nov. 1, 2016 – April 30, 2017	Nov. 1, 2017 – April 30, 2018	Nov. 1, 2018 – April 30, 2019	Nov. 1, 2019 ~March 19, 2020
A	Observed trips with at least one catch record east of 72° 30' W Longitude	401	391	555	724	646	397
B	That met the criteria in row A <u>and</u> used small mesh at some point during their trip	172	252	376	364	354	204
C	That met the criteria in rows A-B <u>and</u> landed more than 200 pounds summer flounder on whole trip	72	92	150	135	164	97
D	That met the criteria in rows A-C <u>and</u> discarded >10% of summer flounder catch east of 72° 30' W Longitude	21	18	36	47	53	24
E	% of observed trips with catch east of 72° 30' W Longitude that also used small mesh, landed >200 pounds of summer flounder, and discarded >10% of summer flounder catch (row D/row A)	5.20%	4.60%	6.50%	6.50%	8.20%	6.05%
F	Total summer flounder discards (pounds) from trips meeting criteria in A-D	14,579	16,470	14,640	33,868	18,186	11,672
G	Total summer flounder landings (pounds) from trips meeting criteria in A-D	15,224	23,295	25,472	76,780	59,960	29,540
H	Total catch (pounds) from trips meeting criteria in A-D	29,804	39,763	40,113	110,648	69,145	41,212

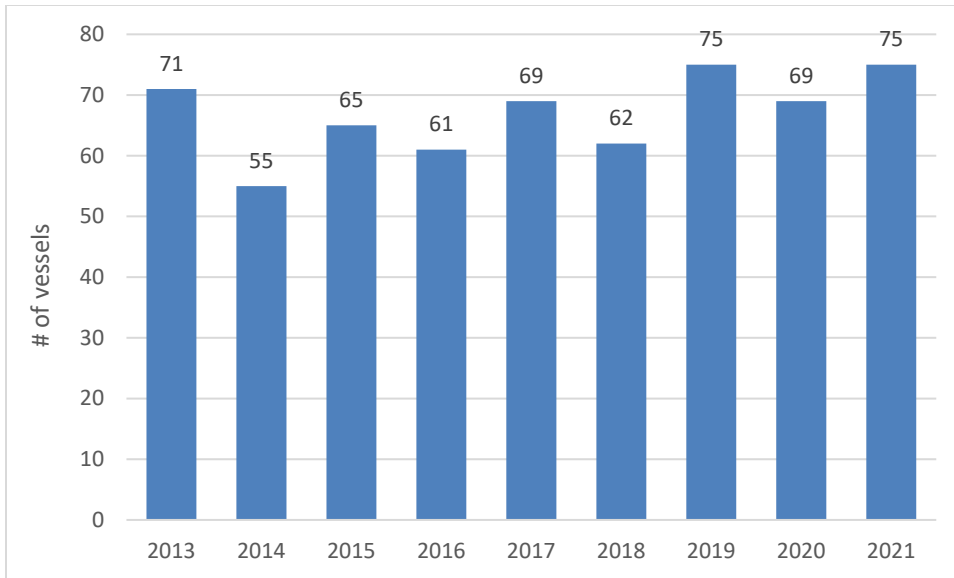


Figure 4: Number of vessels issued the small mesh LOA for the SMEP from fishing year 2013-2021. Source: Pers. Comm., GARFO Analysis & Program Support Division, July 11, 2022.

Flynet Exemption Program

Vessels fishing with a two-seam otter trawl flynet are also exempt from the minimum mesh size requirements. Exempt flynets have large mesh in the wings that measure 8 to 64 inches, the belly of the net has 35 or more meshes that are at least 8 inches, and the mesh decreases in size throughout the body of the net, sometimes to 2 inches or smaller. This exemption was created through Amendment 2 in 1993, as suggested by the South Atlantic Fishery Management Council and the State of North Carolina to accommodate flynet fisheries targeting other species and catching limited amounts of summer flounder. The NMFS Regional Administrator may withdraw the exemption if the annual average summer flounder catch in the flynet fishery exceeds 1% of the total flynet catch.

Typically, the MC reviews data from the North Carolina flynet fishery as the bulk of flynet landings in the Greater Atlantic region originate from North Carolina, though the flynet fishery in North Carolina is small. The supplemental memo from Lorena de la Garza dated June 24, 2022 (see Attachment) indicates that no summer flounder were landed in the North Carolina flynet fishery from 2015-2021. Flynet landings in North Carolina have declined in recent years due to shoaling issues at Oregon Inlet.

The flynet exemption was explored in more depth through the Monitoring Committee's 2015 comprehensive review of commercial management measures.¹⁰ The MC determined at the time that other states, including Virginia, New Jersey, and Maryland may have small amounts of flynet landings; however, data were limited or unavailable for most other states and flynet landings of summer flounder in these states were believed to be insignificant.

In response to public and Board member comments, the MC has previously noted a need to better understand the use and configuration of flynet and high rise trawl nets as they relate to this exemption. Past discussion of this issue led to the MC identifying a possible compliance and enforcement issue of vessels that don't strictly meet the regulatory definition (which specifies a two-seam net) possibly fishing under the flynet exemption with four-seam high rise nets. The MC recommended exploration of

¹⁰ See the report at: http://www.mafmc.org/s/Tab11_SF-S-BSB-Commercial-Measures.pdf.

the extent to which existing datasets allow for evaluation of specific trawl gear configurations, and noted the need for input from gear experts, industry, and enforcement on this issue.

As described above, there has not been sufficient staff time to dedicate to a more in depth evaluation of this exemption in 2022. Staff recommend no changes to this exemption for 2023, and that additional analysis be conducted in a future year if prioritized by the Council and Board.

Recreational Management Measures

Recreational management measures for 2023 will be determined later in 2022. Typically, the Council and Board review preliminary current year data through Wave 4 (July-August) to set recreational bag, size, and season limits for the upcoming year. Improved statistical methods for predicting the impacts of bag, size, and season limits on recreational harvest (i.e., the Recreational Economic Demand Model and the Recreational Fleet Dynamics Model) are expected to be available for summer flounder by fall 2022. The Monitoring Committee will meet in November 2022 to review available data and model outputs and to make recommendations for recreational bag, size, and season limits for 2023. 2023 will be the first year that recreational measures for summer flounder, scup, and black sea bass will be set using the recently approved [Percent Change Approach](#).



Attachment

ROY COOPER
Governor

ELIZABETH S. BISER
Secretary

KATHY B. RAWLS
Director

Memorandum

To: Kiley Dancy, MAFMC

From: Lorena de la Garza, NCDMF

Date: June 24, 2022

Subject: Species composition and landings from the 2021 North Carolina flynet fishery

The 2021 North Carolina flynet fishery landed 5,889 pounds of finfish consisting of black sea bass, scup, and smooth dogfish. The 2021 North Carolina flynet fishery landings are not reported within a table because the data are confidential and cannot be distributed to sources outside the North Carolina Division of Marine Fisheries (North Carolina General Statute 113-170.3 (c)). Confidential data can only be released in a summarized format that does not allow the user to track landings or purchases to an individual. Summer flounder were not landed in the 2013, 2015, 2016, 2017, 2018, 2019, 2020 and 2021 flynet fisheries. Total flynet landings in 2021 are the second lowest since the trip ticket program began in 1994 (2013 being the lowest at 5,797 pounds). Reduced fishing effort on targeted fish species and shoaling at Oregon Inlet continue to result in a low number of flynet boats landing at North Carolina ports.



Summer Flounder, Scup, and Black Sea Bass Fishery Performance Report June 2022

The Mid-Atlantic Fishery Management Council's (Council's) Summer Flounder, Scup, and Black Sea Bass Advisory Panel (AP) met jointly with the Atlantic States Marine Fisheries Commission's (Commission's) Summer Flounder, Scup, and Black Sea Bass AP on June 16, 2022 to review the Fishery Information Documents and develop the following Fishery Performance Report for all three species. The primary purpose of this report is to contextualize catch histories for the Scientific and Statistical Committee (SSC) by providing information about fishing effort, market trends, environmental changes, and other factors.

Please note: Advisor comments described below are not necessarily consensus or majority statements.

Additional comments provided by advisors via email are attached to this document.

Council Advisory Panel members present: Katie Almeida (MA), Frank Blount (RI)*, Bonnie Brady (NY), Greg DiDomenico (NJ)*, Jeff Deem (VA), Joseph Devito (NY), James Fletcher (NC), Jeremy Hancher (PA), Victor Hartley (NJ), Greg Hueth (NJ), Mike Plaia (CT)*, Bob Pride (VA), Mike Waine (NC), Harvey Yenkinson (PA)

Commission Advisory Panel members present: Frank Blount (RI)*, Greg DiDomenico (NJ)*, Jim Lovgren (NJ), Mike Plaia (CT)*

*These individuals serve on both the Council and Commission APs.

Others present: Chris Batsavage (Council/Board member, NC DMF), Tracey Bauer (ASMFC Staff), Julia Beaty (MAFMC Staff), John Boreman (SSC), Dustin Colson Leaning (ASMFC Staff), Karson Coutré (MAFMC Staff), Kiley Dancy (MAFMC Staff), Justin Davis (Board member, CT DEEP), Neil Delanoy, Steve Doctor (MD DNR), Hannah Hart (MAFMC Staff), Mark Holliday (SSC), Carolyn Iwicki, Emily Keiley (NMFS GARFO), Adam Nowalsky (Council/Board member, NJ)

Discussion questions

1. What factors 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?

General Comments (All 3 Species)

Market/Economic Conditions

Several advisors voiced concerns about the impacts of increasing costs of gas, bait, packing boxes, ice, equipment, etc. on commercial and recreational fisheries. Multiple advisors said this was the biggest issue facing commercial and recreational fisheries for all three fisheries this year.

One advisor said commercial fisheries will not be able to operate profitably and will struggle to pay crew. This advisor recommended an emergency action from the White House to provide economic relief to commercial fishermen given that they supply critical food to the nation.

A few advisors said increased prices are resulting in reduced recreational fishing effort, and they are observing fewer boats on the water and in marinas. For-hire businesses are incurring higher costs and are having to charge more for trips. One advisor noted a decline in for-hire clients, including fewer trips from clients who used to be regulars. Due to the added cost of gas, tolls, and the price of a trip, clients are being more selective on how many and what trips they take. Another advisor said he has made this same personal decision himself as it is not economically feasible to take the same number of party boat trips as he would have typically done in past years. Another advisor noted that these increased costs are also coming at a time of more restrictive regulations for species such as scup and black sea bass, which will further reduce fishing effort. Multiple advisors also commented on increased prices for recreational bait and how this may impact what species anglers are targeting.

One advisor noted that the world is in a unique post COVID-19 time where people are starting to get back into their “normal” day to day, but the current state of the economy is going to impact seafood purchases, fishing effort, and the number of anglers on the water. One advisor expressed concern about the impacts of imported fish on the U.S. market. He said imports flood the market and affect the price of U.S. caught fish and suggested the need to further investigate this issue.

Recreational Management Issues

One advisor said more people are comfortable gathering together this year compared to 2020 and 2021. This may be working in combination with the increased prices described above to further reduce recreational fisheries participation this year. In 2020 and 2021 recreational fishing was viewed as safe outdoor activity during the pandemic and effort was higher. This advisor thought these impacts on effort will be important to consider in upcoming assessments.

Another advisor asked what number of recreational fishermen NMFS is using to generate recreational harvest estimates. Staff responded that NMFS does not produce a number of recreational fishermen, and instead measures effort in the number of angler trips. This advisor also said an accurate count of all saltwater recreational anglers is needed to comply with the Magnuson Stevens Act and to better manage recreational fisheries for all species. This advisor recommended requiring electronic reporting for the recreational sector and said that until this requirement is in place, we will continue to make decisions off flawed data.

One advisor expressed concern about the Council and Commission’s recent final action decision on the Harvest Control Rule. She questioned how the Harvest Control Rule would prevent overfishing and would prevent negative impacts to the commercial sector.

Commercial Management Issues

One advisor suggested modifying the minimum trawl mesh size to 5 inches for all three species from November through April so fishermen could use one net to target all three species during this period. He noted that during this time of year, the commercial fisheries for these species mostly take place offshore where there are fewer juveniles compared to inshore. He suggested using a high rise style net that doesn't hit the bottom as hard as a typical summer flounder net.

Another advisor expressed support for a common mesh size but preferred 4 inches over 5 inches. He also said the minimum fish sizes should be modified to correspond with the changed minimum mesh sizes. He suggested a 10 or 11 inch summer flounder minimum fish size and a minimum size for black sea bass and scup of between 6 and 8 inches.

Environmental Conditions

One advisor voiced concern on the Outer Banks in North Carolina eventually being washed away due to sea level rise and storms.

Another advisor said the impacts of the addition of chemicals in the water, including chemicals and disinfectants used to kill the COVID virus, should be investigated. This advisor also noted the need to investigate other pollutants being dumped into water bodies in the south and the northward movement of these pollutants and potential impacts on mid-Atlantic fisheries.

One advisor suggested that environmental cycles impact fisheries and their influence on fish abundance and behavior should be studied.

Summer Flounder

Market/Economic Conditions

One advisor said that from January through April this year, commercial fishermen reported unusually low prices for summer flounder. Prices have since recovered to typical levels for this time of year. Low prices earlier this year may have been driven by the lack of the hospitality business in New York, as summer flounder is not a big retail fish and is bought mostly by hotels and restaurants, where demand is still down due to COVID.

An advisor from New York said summer flounder prices have increased there for the first time in years, to the \$5-6 per pound range. Because New York has a low quota allocation, this may not be indicative of the rest of the market.

As described under General Comments, several advisors voiced concerns about high fuel prices. One New York advisor stated that fishermen will not necessarily fish as far as they typically do for summer flounder and may not use permits they hold in other states as much. For example, New York fishermen permitted in other states won't make a trip to land in Virginia or North Carolina due to the two to three day steam time required. Another advisor agreed that high costs will likely cause lower landings in Virginia and North Carolina, contributing to continued commercial quota underages. He stated that managers should come up with new "outside the box" ideas for that quota, because those states do not have the boats anymore to harvest it and vessels from other states won't incur a \$30,000 fuel bill to fish there.

This advisor also said recently he was aware of two boats fishing a few miles from Point Pleasant, NJ for three or four days, getting only a few hundred pounds for 15 hours, since there are not a lot

of fluke available yet this year. While they sold them for a good price, over \$6 per pound, after the cost of fuel there was nothing left. He said this is not sustainable, and while managers cannot do anything about this, they should be aware that it will reduce participation.

Environmental Conditions and Availability

One advisor noted that the current assessment update includes data through 2019 and shows increasing biomass during 2017-2019. However, recreational harvest over these has not shown the same increasing trend. He is curious what the next assessment (in 2023) will show and is interested in tracking how landings correspond with the biomass trends from the assessment.

Three advisors said this year, summer flounder do not seem to be inshore or in the bays yet in large numbers and recreational summer flounder fishing has not taken off yet this summer. One advisor suggested that this was due to water temperatures and that some are starting to show up now.

General Management Issues

One advisor suggested that the decline in recruitment between 2010 and 2019 is because the spawning stock biomass came to consist of smaller fish due to Council and Commission's policies which drove increased harvest of larger female fish. He stated that spawning stock biomass was lower in the 90s but recruitment was higher, because the fisheries were harvesting smaller fish and allowing the larger fish to spawn. He emphasized that management needs to change its current policies and recognize the importance of "big old fat fecund female fish."

Recreational Fishery Issues

A few advisors commented on the 2022 recreational regulations in New Jersey which include a split slot limit measure (two fish allowed at 17-17.99 inches and one fish above 18 inches). One advisor was supportive of this measure, but hoped that next year the slot limit range could be widened. He hoped that a slot limit would protect more larger females and have positive impacts on the summer flounder stock.

Another advisor expressed some hesitation about the slot limit, stating that he believes more fish have been harvested in southern New Jersey so far this year than all of last year combined. He was concerned that harvest estimates may notably increase which could have negative impacts on the recreational fishery in the long run. While he noted that a slot limit may slightly reduce discards, he thinks people will continue to fish until they catch a big fish, such that harvest of larger breeders may not be substantially reduced. This advisor also thought the lower bag limit this year of three total fish in New Jersey would have negative economic impacts by preventing out of town anglers from investing in fishing trips to target summer flounder.

Research Recommendations

One advisor said he believes recent low summer flounder recruitment is caused not by the number of eggs produced, but by predation on larvae in the first year of life. He suggested that researchers determine what is eating them and how that is impacting the summer flounder stock.

One advisor noted that there will be extensive wind farms throughout the continental shelf and we need to know how that will impact fishery migrations. He noted that summer flounder will be affected by underground cables and magnetic fields, and we need to know if they will avoid these cables and how this will change their migratory routes as they are bottom dwellers. This could also drive them into less optimal areas, for example, areas with higher concentrations of predators. He requested that these impacts be documented. Another advisor agreed with this recommendation.

One advisor expressed concern that we don't know as much as we should about the migration patterns of summer flounder beyond a general East-West pattern. There has been a shift in the stock distribution toward the Northeast that is blamed on oceanic factors, but he suggested that we need to better understand this distribution change as there may be more to it. This same advisor also suggested that we get a better handle on the question of summer flounder recruitment by adjusting sampling locations to better account for changes in stock distribution. Finally, this advisor recommended that we find better ways to conduct population surveys than trawl surveys, which disturb fish and their habitat and kill a lot of fish. Newer and better technology may exist to conduct surveys without killing the fish and destroying vulnerable habitats.

Scup

Market/Economic Conditions

One advisor said prices for scup this winter were good, and prices got up to \$2.50 per pound for jumbos, \$1.75 per pound for larges, and \$1 per pound for mediums. She added that it was extremely windy off New York during this year's Winter I season, so optimal fishing days were few and far between and only those bold enough to face the poor weather conditions were able to fish.

In addition to the comments described above about impacts of higher prices on for-hire fisheries for all three species, one advisor said scup are not common in state waters off New Jersey and the price of fuel will likely impact recreational effort and individuals' willingness to make the trip into federal waters.

One advisor expressed concern on the impact of imported fish on the U.S. scup market. This advisor also commented on the historical importance of small fish for low-income families and suggested decreasing the commercial minimum size limit to six or seven inches to help bring that market back.

Commercial Fishery Issues

One advisor recommended modifying the southern portion of the Southern Scup Gear Restricted Area (GRA). He said scup are no longer common as far south as Virginia and the southern 20 miles of the southern GRA is only taking away fishing area from small mesh trawl fisheries with no biological benefit to scup.

A few advisors recommended allowing commercial transfers at sea. These advisors indicated allowing transfers at sea would reduce regulatory discards and help commercial fishermen harvest more of the commercial quota each year. However, there was some confusion on which species at sea transfers was already permitted and one advisor brought up that at sea transfers for scup is already allowed in rule. One advisor suggested implementing some provisions on how far from shore and time of year at sea transfers are allowed.

Recreational Fishery Issues

Advisors voiced concern about the high landing estimates produced by MRIP. Two advisors questioned if poor data scenarios are inflating harvest estimates and requested reaching out to MRIP staff to get more details. One advisor said the 2021 wave two estimates for Massachusetts were particularly concerning and expressed frustration on how they were driven by a single trip intercept.

Some advisors also questioned why the recreational sector is continuing to exceed the recreational harvest limit (RHL) and one advisor expressed concern about the new Recreational Harvest Control Rule, as described above in the General Comments section for all three species.

Research Recommendations

Several advisors voiced the need to better understand how offshore wind energy development will impact scup. One advisor said some of the planned project areas are within the scup migratory path and expressed the need to better understand how noise pollution and vibrations caused by offshore wind energy structures will impact scup behavior and biology.

Black Sea Bass

Market/Economic Issues

One advisor from New York noted that the price for black sea bass remains low and has not yet fully recovered from impacts of the pandemic, likely because the market for black sea bass is largely driven by restaurants.

Commercial Fishery Issues

One advisor suggested a 7,500 pound commercial trip limit for black sea bass in federal waters. There is currently no commercial trip limit in federal waters. Several states have implemented trip limits for state waters; however, states that manage their commercial black sea bass fisheries with individual transferable quotas (ITQs) do not have trip limits. This advisor noted that a single 50,000 pound trip from an ITQ vessel once caused the price to crash for two weeks. Lower prices result in fishermen needing to catch more fish to make the same amount of money. He noted that some pot fishermen have sold their ITQs to trawl fishermen, which has contributed to the issue of high landings from single trips negatively impacting the price for all fishermen in an area. This advisor said he did not support ITQs for black sea bass for this reason and because they can lead to a few fishermen landing most of the fish.

Recreational Fishery Issues

Two advisors noted that black sea bass availability to recreational anglers remains very high.

One advisor said he hasn't seen as many recreational boats on the water as in previous years, but the boats that are out are doing very well catching black sea bass. He said no matter what management does, the recreational fishery will keep going over their limits because availability is so high. Even with fewer boats in the fishery, less clients on for-hire trips, and bait prices rising, he predicted that the recreational fishery would still exceed the RHL due to high availability. He thought the recreational fishery should be less restricted given that biomass is so high.

One advisor noted that if the RHL is decreased in future years due to past overages, then the reduced RHL could cause the stock to grow even more. This would lead to even higher availability and continued overages. He argued that reducing landings limits in response to overages is counterproductive for abundant stocks. He also noted that minimum size limits for black sea bass result in anglers mostly harvesting male fish, which should not be overly detrimental to the stock.

One advisor from New Jersey said that with increased costs, for-hire vessels are charging \$105 per trip with a 10 fish bag limit for black sea bass. He did not think these trips would be economically

feasible with an 8 fish bag limit. He noted that for-hire vessels don't have many other species to target besides black sea bass, especially with lower summer flounder availability.

Research Recommendations

One advisor asked if black sea bass can transition from female to male and then back to female. He asked this question because he observed an 8-10 pound black sea bass which was full of roe and normally female black sea bass do not reach this size, to his knowledge. He questioned if this could be happening due to contaminants in the water and recommended research into this topic. Another advisor noted that dogfish can store sperm and wondered if black sea bass could store roe after starting to transition to males.

Additional Email Comments

From: Katie Almeida <kalmeida@towndock.com>
Sent: Wednesday, July 6, 2022 11:26 AM
To: Hart, Hannah <hhart@mafmc.org>
Subject: RE: SFSBSB draft Fishery Performance Report

Hi Hannah,

I had to leave the call early, but I just wanted to say that I am against decreasing the commercial minimum size scup. Can that be noted?

Thank you,

Katie

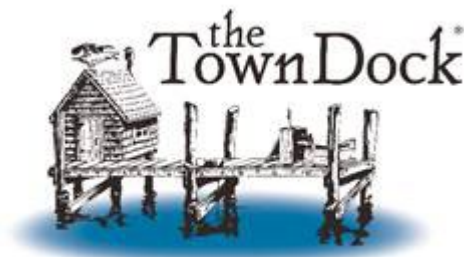
Katie Almeida

**Senior Representative, Government Relations
and Sustainability**

45 State Street | Narragansett, RI 02882 USA

O: 401-789-2200 x143 | C: 508-930-2633

www.towndock.com



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COMMENTS BY ERIC BURNLEY 6/17/22

Summer flounder:

Summer flounder are the most important recreational fish in Delaware. They are available from the shallow water on the Inland Bays out to the offshore wrecks.

At this time, I would say flounder fishing is decent. No one is setting the world on fire, but if you know how to fish, you can pick up a few here and there and if you work at it, you can box a four-fish limit.

Everything got off to a late start this year due to cold water sticking around into late spring. I suspect we will see the best of the flounder fishing in the ocean beginning in late June into early July.

The drop in minimum size from 16.5 to 16 inches has not made a great difference. The photos I see and the reports I get don't mention many 16-inch fish. I am also not hearing complaints about having to sort through lots of shorts to find a few keepers. I don't see this as a good sign. A lack of short fish could mean a lack of flounder in the pipeline for the future.

I am always concerned about global warming. I have seen what it has done with triggerfish, sheepshead, striped bass and spadefish. I wonder what it will do with flounder?

In the past, the marshes behind the Barrier Islands of Virginia and up into Delaware were the nursery grounds for summer flounder. As these waters warm will the flounder try to move north and find it hard to relocate into New York City?

Then there is the normal progression of summer flounder from south to north. Smaller flounder head north every spring after spending the winter on the shelf. They summer further north every year ending up on the New England Shoals right now. Will they be going into Canada in the future as the ocean warms?

Summer flounder could use more research on their breeding habits. We know they spawn in the fall in the ocean, but where in the ocean? Should we stop flounder fishing during the spawning season? Should we have a maximum size limit on flounder as we do on striped bass? Do we know the spawning stock biomass for summer flounder?

Of course, some people always want more and some always want less, but I think for summer flounder a four-fish limit at 16 inches is just right for now. These fish are not easy to catch and most anglers don't catch a limit on any given day so I think the current limit is safe.

Black sea bass:

What happened with black sea bass in 2022 was a travesty. There was no logical reason to raise the size limit to 13 inches and cut the season by 20 days when the biomass was three times the target level.

Black sea bass fishing is a drop and crank operation. Most of the time. There are times when you will mark thousands of fish and not one will bite. I am sure they have a good reason, but so far no one I know has been able to figure it out.

With the increase in the size limit, I must assume there will be an increase in release mortality. When fishing from a head boat, as I often do, the number of small sea bass floating away is quite high. Granted, many will right themselves and swim back down to the bottom, but not all.

Perhaps managers might consider this factor before arbitrarily raising the minimum size limit. To say black sea bass are numerous on the artificial reef sites such as the Del-Jersey-Land is quite an understatement. Trying to fish for flounder or tog on these structures is difficult due to the overwhelming presence of the sea bass. They do thin out in the winter giving tog fishermen some relief.

I certainly would like to see more information on the breeding habits of black sea bass. When do they spawn? Where do they spawn? When they get lockjaw is that because they are spawning? At what age do they spawn?

I have seen the data on the migration of black sea bass from south to north. At what point will we lose them in Delaware? Is there any similar species that might take their place?

As for future regulations, let's go back to 12.5 inches. Let's keep the season running from May 15 to December 31. There are plenty of black sea bass out there so let's share the bounty.

Scup:

I will save scup comments for those to my north. While there was a time when porgies were an important fishery in Delaware that time is past. A few more show up every year, but not enough to consider this a fishery.

From: James Fletcher <bamboosavefish@gmail.com>
Sent: Wednesday, June 1, 2022 1:25 PM
To: Kiley Dancy; Andrew Petersen
Subject: Re: Agenda for 6/16 Summer Flounder, Scup, Black Sea Bass Advisory Panel meeting

Before we go down same line of thought::

CAN ADVISORS DISCUSS BOFFFF * BIG OLD FAT FECUND FEMALE FISH*** AND CELL PHONE REPORTING BY RECREATIONAL IN EEZ? BLUE FIN DATA HAS AN APP FOR RECREATIONAL REPORTING AND WILL HANDLE DATA FOR A FEE.**

SCUP SUMMER FLOUNDER BLACK SEA BASS PLANS ARE BASED ON FAULTY INCORRECT SCIENCE!

All net sizes are incorrect for all three species; fishermen asked for 5 inch cod end all three species.

BOFFFF would favor recreational total length & no discards. if videoed throwing anything back NOVA in EEZ. LOW INCOME FROM SHORE WOULD HAVE FISH FOR FOOD **NO DEAD DISCARDS!**

BOFFFF commercial vessel has dollar value for year *** must land and sell all catch ** no exceptions NO DEAD DISCARDS.

ARE CLOSED SEASONS AND SIZE LIMITS A NOAA / NMFS DEPARTMENT OF COMMERCE; METHOD TO ALLOW IMPORTS A MARKET SHARE?

WILL STAFF PROVIDE IMPORT INFORMATION FOR FISH THAT COMPETE WITH SCUP BLACK SEA BASS & SUMMER FLOUNDER?

COMMERCE NOAA NMFS FIRST PROPOSED SIZE LIMITS AND CLOSED SEASONS AS PART OF MAGNUSON. WHY DOES MAGNUSON ALLOW DEAD DISCARDS?

ALLOW AN ADVISOR DISCUSSION OF BOFFFF JAMES FLETCHER

From: James Fletcher <unfa34@gmail.com>
Sent: Monday, June 13, 2022 10:19 AM
To: Kiley Dancy
Subject: Up coming review Summer Flounder Scup Black Sea Bass.

I have asked in the past for the pounds of imports for Talipa and imports that are sold in place of summer Flounder and Black Sea bass, The Council has an economist who should be able to obtain the numbers .

in the past I requested these numbers with no results so I am asking again.

Advisors need to know the amount of fish that are imported into the market U.S. fishermen could fill.

Our discards are only discards because of Council size limits.

BOFFF begs the advisors to ask that all fish caught be utilized. I do not understand why for recreational.

1. Council can / will NOT SUPPLY A NUMBER OF SALT WATER ANGLERS 7 comply with 2006 Magnuson. 2 why Council NMFS WILL NOT REQUIRE MANDATORY CELL PHONE BY RECREATIONAL!

back to original request. NUMBER OF POUNDS FOR IMPORTS THAT COMPETE WITH SUMMER FLOUNDER, SCUP ** TALIPA SUMMER FLOUNDER IF POSSIBLE PRICES.

THANK YOU JAMES FLETCHER.

From: James Fletcher <unfa34@gmail.com>
Sent: Thursday, June 16, 2022 11:05 AM
To: Beaty, Julia <jbeaty@mafmc.org>
Subject: Today's meeting possible question

With low income fishers fishing from shore not being able to keep fish smaller than size set for EEZ by affluent council members;

sizes set for bragging rather than food.

DOES ANY METHOD EXIST TO IMPLEMENT*** TOTAL LENGTH RETENTION AND NO **DISCARDING**?

Could Council and mainly STATES enact a A temporary rule ;;; RECREATIONAL FISHERS REPORTING ON CELL PHONE TO A BLUE FIN DATA RECREATIONAL APP. CAN RETAIN 70 INCHES OF FLOUNDER (SUMMER & SOUTHERN) 150 INCHES black sea bass 300 inches scup.

NO DISCARDS !! [MUST REPORT CATCHES {LENGTHS} DAILY

Persons wishing not t report by cell phone would fish with current regulations:::

HARD TIMES CALL FOR DRASTIC MEASURES!!!

THOSE WORKING FOR GOVERNMENT AND APPOINTED TO COUNCIL DO NOT KNOW WHAT HARD ECONOMIC CONDITIONS ARE!

BLUE FIN DATA HAS AN APP READY FOR REPORTING.

GORDON WILL THROW A FIT *** NMFS WILL SAY DOES NOT COMPLY WITH MAGNUSON ***

NMFS AND GORDON HAS NOT COMPLIED WITH MAGNUSON 2006 RECREATIONAL SALT WATER ANGLER REGISTRATION LIST. **THESE GROUPS ARE THE FIRST TO STOP LOW INCOME FISHERS FROM BEING ABLE TO KEEP FISH FOR FOOD!** THEY HAVE BEEN SILENT ON BOFFFF !

THIS IS VOLUNTARY REPORTING TO GIVE FOOD TO LOWER INCOME SHORE SIDE FISHERS FOOD #####!

CAN THE ADVISORS HOLD A ROLL CALL VOTE ON TOTAL LENGTH AND NO DISCARDS WITH CELL PHONE REPORTING?

PROVIDED COUNCIL DOES NOT HAVE FUNDS FOR THE **BLUE FIN DATA APP PERHAPS A GO FUND ME PAGE COULD BE USED TO PAY FOR APP.**

PLEASE FORWARD TO ALL ADVISORS!

i WAS ASKED TO LEAVE A DOCK AREA SO A FAMILY COULD KEEP THE FISH THEY WERE CATCHING FOR FOOD!

COUNCIL MEMBERS WANTING BRAGGING FISH SHOULD FISH WITH ONLY 7 O HOOKS ON BOATS NOTHING SMALLER {FEW SCUP WILL BE CAUGHT} !

THANK YOU

JAMES FLETCHER

UNITED NATIONAL FISHERMAN'S ASSOCIATION YES I AM UPSET!

From: James Fletcher <unfa34@gmail.com>
Sent: Tuesday, June 21, 2022 8:28 AM
To: Lewis, June; Beaty, Julia; Kiley Dancy
Subject: No Answer to Question on SF Scup BSB

I receive no answer from a number of request.

1. What is number of recreational fishers in EEZ
2. Why no Comments for a total length for all manages species {no discards}
3. Why do regulations target the largest females?
4. WHAT ARE THE IMPORT NUMBERS FOR FISH { POUNDS OF IMPORTS ALLOWED INTO U.S. BY NMFS & NOAA THAT REPLACE THESE FISH IN MARKET ?.

THE BAD PART IS 80% OF RECREATIONAL FISHERS FISH FROM SHORE & THE CURRENT REGULATIONS DO NOT ALLOW THEM TO KEEP FISH FOR FOOD.

DISCARDS FROM SHORE SIDE FISHING IS NOT CALCULATED CORRECTLY. WHY NOT DISCUSS TOTAL LENGTH RETENTION & NO DISCARDS ESPECIALLY FOR STATE WATERS? THUS ALLOWING LOW INCOME FISHERS FOOD?

Have you ever considered stock enhancement / ocean ranching where faster growing fish or eggs are released.

NO I SELDOM EVER GET ANSWERS! SOME OF MY PROJECTS TAKE 10 YEARS TO BECOME REALITY & THEN ONLY BECAUSE SOME ONE ELSE HELPS TO PUSH THE PROJECT.
NOAA NMFS WANTS REDUCTION OF FISH FOR FOOD NOT PRODUCTION FOR FOOD.

THANKS FOR ANY AND ALL HELP James Fletcher.

From: James Fletcher <unfa34@gmail.com>
Sent: Wednesday, June 29, 2022 10:46 AM
To: Hart, Hannah
Subject: Re: SFSBSB draft Fishery Performance Report

Information

<https://www.pewresearch.org/internet/fact-sheet/mobile/> this number of people with cell phones.
council should require reporting using *BLUEFIN DATA APP FOR RECREATIONAL REPORTING!*

would you send the Advisor report to Matthew.cutler@noaa.gov Some how his group is looking at under served population of people AKA low income minority groups.

Side line question: do you know why council will not provide a number for salt water recreational fishers as required by 2006 magnuson?

Do you know who opposes total length retention & NODISCARDS?

WELCOME TO MAFMC STAFF people like me asking questions are reason your work is hard.

THANK YOU

From: James Fletcher <unfa34@gmail.com>
Sent: Thursday, July 7, 2022 12:26 PM
To: Hart, Hannah <hhart@mafmc.org>; Moore, Christopher <cmoore@mafmc.org>; Beal, Robert <rbeal@asmfc.org>
Subject: Re: SFSBSB draft Fishery Performance Report

CONSIDER THE COUNCIL IS AND HAS BEEN PROTECTING ***** NEW TERM ***
PE*** PRESTIGIOUS ELITE***

WE KNOW THEY ARE ON COUNCIL & ASMFC

THE DEPRIVED SHORE SIDE ANGLER [DSSA[*** NEW *** IS NOT REPRESENTED!
COUNCIL OR ASMFC

I HOPE ATTACHED DEFINITION TRAVELS WITH THIS EMAIL.

*THE PROTECTED PRESTIGIOUS ELITE MUST BE IDENTIFIED AS THIS GROUP MAKES
UP ALL SINGLE VESSEL ANGLERS IN EEZ.*

*need / want to know number of warm bodies that fish in EEZ and or salt water MAGNUSON 2006
thank you Fletcher UNFA*

Attachment:

Who are the 20% PRESTIGIOUS ELITE RECREATIONAL FISHERMEN ?

Who are the 80% deprived shore side subsistence recreational anglers?

When will State fishery Management agencies manage the natural resource of fish for food not
fun for the prestigious Elite?

-Prestigious Elite
prestigious
pre-ste'jas, -stij'as

adjective Having

prestige; esteemed.

1. Practicing tricks; juggling.

2. Definition of *prestigious*

1 ; having prestige : honored

2 archaic : of, relating to, or marked by illusion, conjuring, or trickery

Elite

singular or plural in construction : the socially superior part of society

A group or class of persons considered to be superior to others because of their intelligence, social standing, or wealth

A group of persons exercising the major share of authority or influence within a larger group:

The group or part of a group selected or regarded as the finest, best, most distinguished, most powerful, etc.

Definition of *deprived*

; marked by deprivation especially of the necessities of life or of healthful environmental influences

not having the things that are necessary for a pleasant life, such as enough money, food, or good living conditions:

Synonyms for *deprived*

- depressed,
- disadvantaged,
- underprivileged Lacking in advantage, opportunity, or experience.

Who are the 20% PRESTIGIOUS ELITE RECREATIONAL FISHERMEN ?

Who are the 80% deprived shore side subsistence anglers?

When will State fishery Management agencies manage the natural resource of fish for food not fun for the prestigious Elite?

Summer flounder Data Update for 2022

National Marine Fisheries Service
Northeast Fisheries Science Center
166 Water St.
Woods Hole, MA 02543

Fishery and Survey Data

Reported 2021 landings in the commercial fishery were 4,731 mt = 10.430 million lb, an increase of 14% from 2020, and 83% of the 2021 commercial quota (Figure 1). Estimated 2021 landings in the recreational fishery were 3,092 mt = 6.817 million lb, a decrease of 32% from 2020, and 82% of the 2021 recreational harvest limit (Figure 1). Total commercial and recreational landings in 2021 were 7,823 mt = 17.247 million lb, a decrease of 10% from 2020. Final estimates of fishery discards for 2020-2021 are not yet available.

There were no NEFSC bottom trawl surveys conducted in 2020. The NEFSC spring survey index of summer flounder stock biomass decreased by 41% from 2019 to 2022; the fall index increased by 6% from 2019 to 2021 (Figure 2). The NEFSC fall survey length frequency distributions suggest that an above average year class (mode at about 20 cm total length) recruited to the stock in 2018 with average to below average recruitment since (Figure 3).

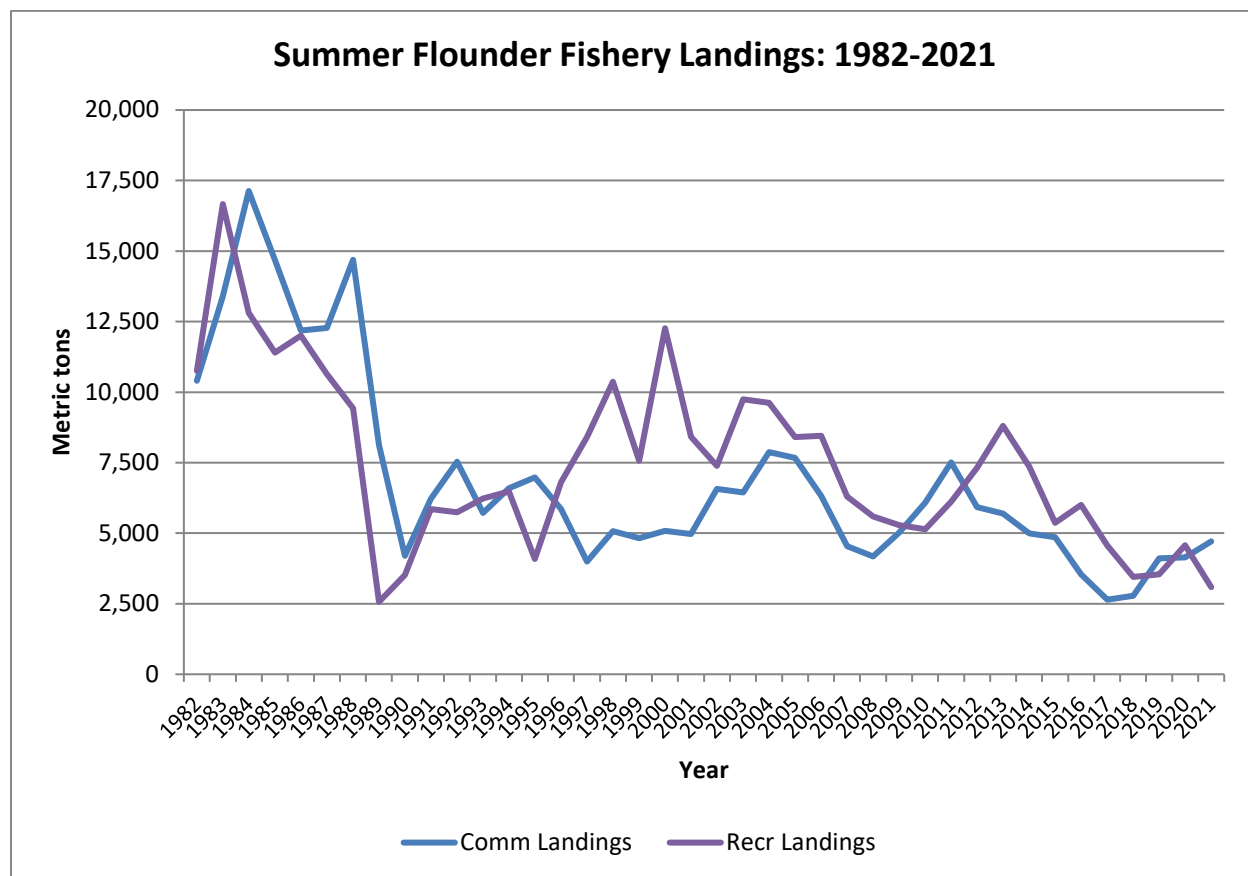


Figure 1. Summer flounder fishery landings.

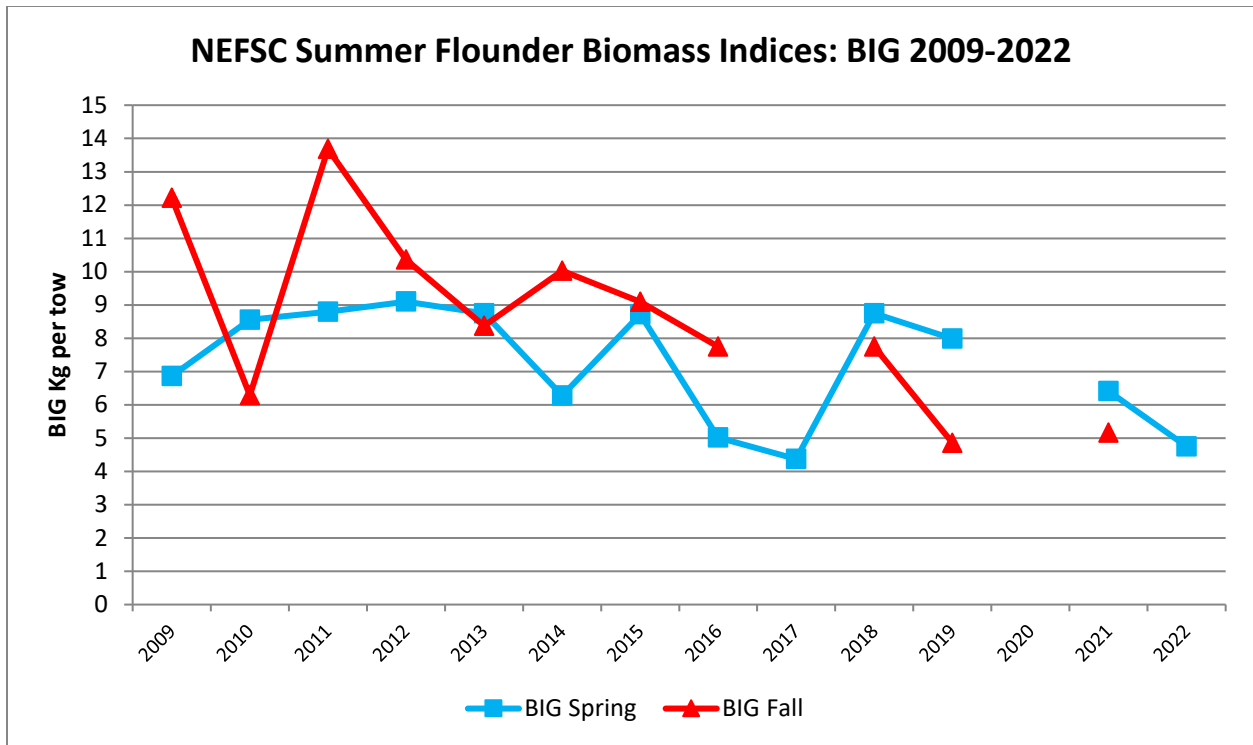


Figure 2. Northeast Fisheries Science Center (NEFSC) bottom trawl survey aggregate biomass indices for summer flounder. There are no valid fall 2017 or spring and fall 2020 indices for summer flounder. Surveys have been conducted with the FSV HB Bigelow (BIG) during 2009-2022.

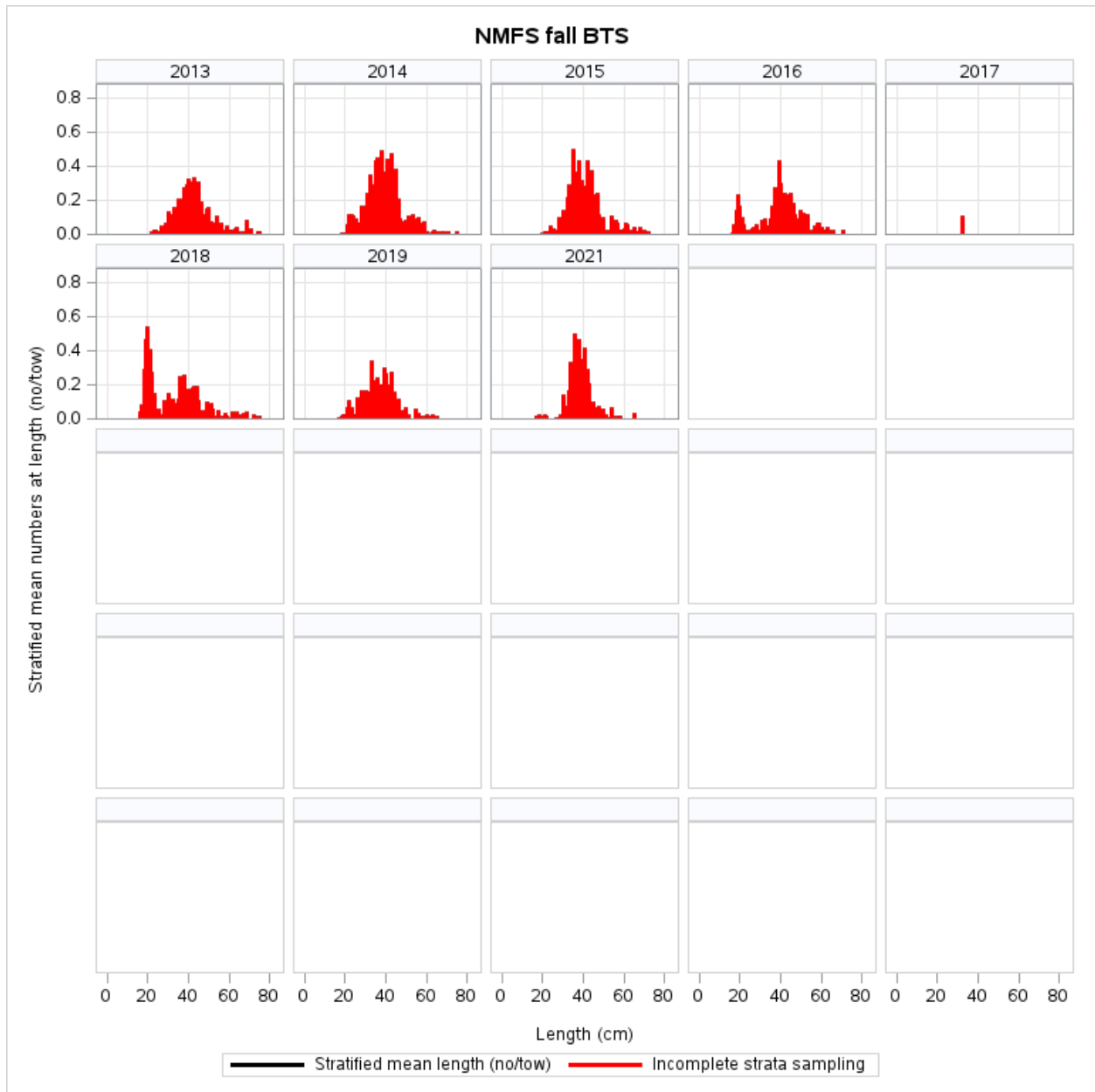


Figure 3. Northeast Fisheries Science Center (NEFSC) fall bottom trawl survey FSV HB Bigelow indices at length since 2013. There was an incomplete survey conducted in 2017 and no survey conducted in 2020.



Summer Flounder Fishery Information Document

June 2022

This document provides a brief overview of the biology, stock condition, management system, and fishery performance for summer flounder (*Paralichthys dentatus*), with an emphasis on 2021. Data sources include unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, as well as Marine Recreational Information Program (MRIP) data and stock assessment information. All 2021 data should be considered preliminary. For more resources on summer flounder management, including previous Fishery Information Documents, please visit <http://www.mafmc.org/sf-s-bsb>.

Key Facts:

- The 2021 management track stock assessment found that in 2019, summer flounder was not overfished and overfishing was not occurring.
- While recruitment for summer flounder has generally been below-average since 2011, the 2018 estimate of recruitment was above average and the largest year class estimated since 2009. 2019 recruitment is estimated to be below average.
- 2021 recreational summer flounder harvest was estimated at 6.82 million pounds, about 82% of the harvest limit of 8.32 million pounds. This is the lowest estimate of recreational harvest since 1989.
- Commercial landings in 2021 (10.36 million pounds; 83% of commercial quota) increased by about 14% from 2020 landings (9.12 million pounds; 79% of commercial quota).
- Average commercial ex-vessel price increased from \$2.69 in 2020 to \$2.91 in 2021. Average price per pound has decreased in recent years from its peak in 2017 (\$4.64 per pound in 2021 dollars).

Basic Biology

Summer flounder spawn during the fall and winter over the open ocean areas of the continental shelf. From October to May, larvae and postlarvae migrate inshore, entering coastal and estuarine nursery areas. Juveniles are distributed inshore and in many estuaries throughout the range of the species during spring, summer, and fall. Adult summer flounder exhibit strong seasonal inshore-offshore movements, normally inhabiting shallow coastal and estuarine waters during the warmer months of the year and remaining offshore during the colder months.

Summer flounder habitat includes pelagic waters, demersal waters, saltmarsh creeks, seagrass beds, mudflats, and open bay areas from the Gulf of Maine through North Carolina. Summer flounder are opportunistic feeders; their prey includes a variety of fish and crustaceans. While the natural predators of adult summer flounder are not fully documented, larger predators (e.g., large sharks, rays, and monkfish) probably include summer flounder in their diets.¹

Spawning occurs during autumn and early winter, and the larvae are transported toward coastal areas by prevailing water currents. Development of post larvae and juveniles occurs primarily within bays and estuarine areas. Most fish are sexually mature by age 2. The largest fish are females, which can attain lengths over 90 cm (36 in) and weights up to 11.8 kg (26 lb). The Northeast Fisheries Science Center (NEFSC) commercial fishery sampling in 2018 observed the oldest summer flounder collected to date, a 57 cm (22.4 in) fish (likely a male) estimated to be age 20. Also sampled were two age 17 fish, at 52 cm (20.5 in; likely a male) and at 72 cm (28.3 in; likely a female). Two large (likely female) fish at 80 and 82 cm (31.5 and 32.3 in) were both estimated to be age 9, from the 2009 year class (the 6th largest of the 36 year modeled time series). These samples indicate that increased survival of summer flounder over the last two decades has allowed fish of both sexes to grow to the oldest ages estimated to date.²

Status of the Stock

In June 2021, the NEFSC provided a management track assessment update for summer flounder with data through 2019. Given data gaps for 2020 related to COVID-19 and the time required to address those gaps where possible, 2020 data could not be incorporated into this update.

The 2021 management track assessment update made minor revisions to the biological reference points for spawning stock biomass (SSB) and fishing mortality (F). The 2021 assessment update results indicate that the summer flounder stock was not overfished in 2019. SSB has generally decreased since 2003. SSB in 2019 was estimated to be about 86% of the biomass target reference point and about 72% above the overfished threshold which is equivalent to ½ of the biomass target (Table 1; Figure 1).

The 2021 assessment also indicated that overfishing was not occurring in 2019, as 2019 F was estimated to be 19% below the fishing mortality threshold reference point (Table 1; Figure 2).

The average recruitment from 1982 to 2019 is 53 million fish at age 0. Recruitment of juvenile summer flounder was below-average from 2011-2017, ranging from 31 to 45 million fish and averaging 36 million fish. The driving factors behind this period of below average recruitment have not been identified. The 2018 year class is above average at an estimated 61 million fish, which is largest recruitment estimate since 2009, while the 2019 year class is below average at 49 million fish.³

Table 1: Biomass and fishing mortality rate reference points and terminal year estimates for summer flounder from the 2021 management track assessment.³

	Spawning stock biomass	Fishing mortality rate (F)
Terminal year estimate (2019)	104.49 million lb (47,397 mt)	0.340
Target	121.73 mil lb (55,217 mt)	N/A
Threshold	60.87 million lb (27,609 mt)	0.422
Status	Not overfished	Not overfishing

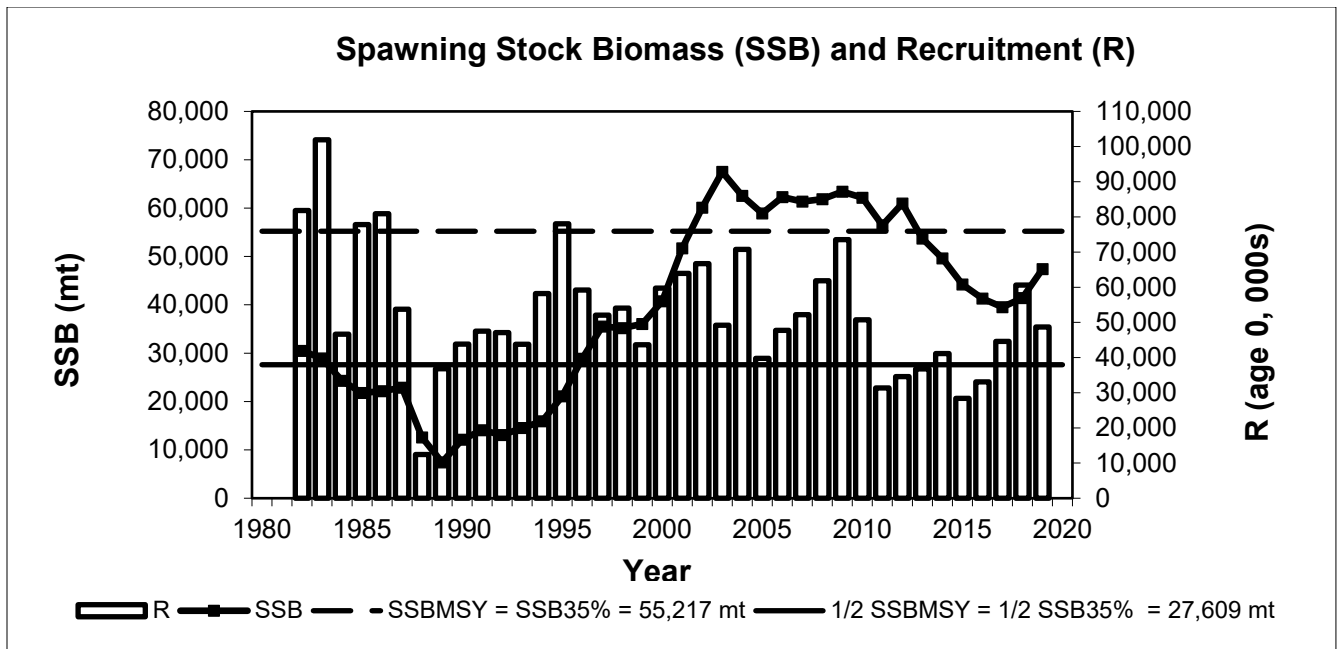


Figure 1: Summer flounder spawning stock biomass (SSB; solid line with square markers) and recruitment at age 0 (R; vertical bars), 1982-2019. The horizontal dashed line is the target biomass level. The horizontal solid line is the threshold biomass level defining an overfished condition.

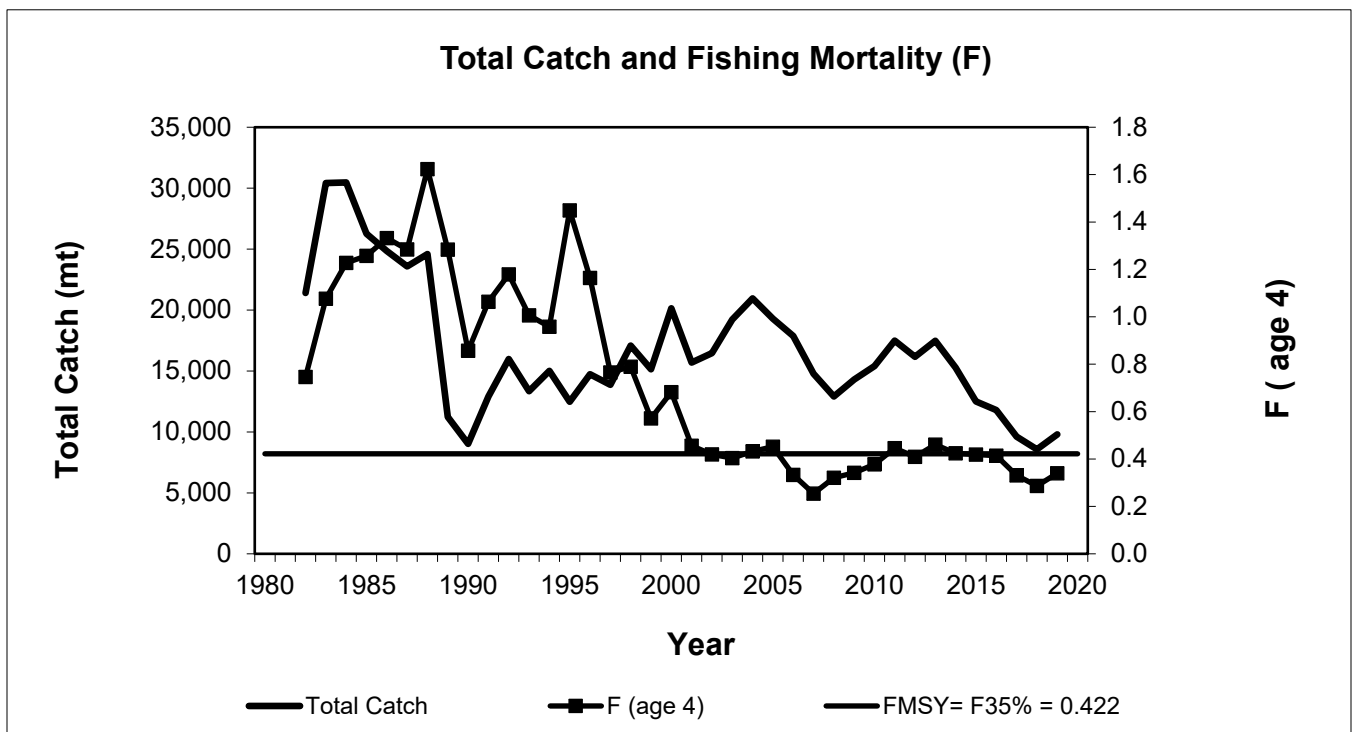


Figure 2: Total fishery catch (metric tons; mt; solid line) and fully-recruited fishing mortality (F, peak at age 4; squares) of summer flounder, 1982-2019. The horizontal solid line is the fishing mortality reference point. When F exceeds this threshold, overfishing is occurring.

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission) work cooperatively to develop fishery regulations for summer flounder off the east coast of the United States. The Council and Commission work in conjunction with 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 (0-3 miles offshore) and federal waters (3-200 miles offshore, also known as the Exclusive Economic Zone, or EEZ).

The joint Fishery Management Plan (FMP) for summer flounder became effective in 1988 and established the management unit for summer flounder as U.S. waters from the southern border of North Carolina northward to the U.S.-Canadian border. The FMP also established measures to ensure effective management of summer flounder fisheries, which currently include catch and landings limits, commercial quotas, recreational harvest limits (RHLs), minimum size limits, gear regulations, permit requirements, and other provisions as prescribed by the FMP. The Summer Flounder FMP, including subsequent Amendments and Frameworks, are available on the Council website at: <http://www.mafmc.org/fisheries/fmp/sf-s-bsb>.

There are large commercial and recreational fisheries for summer flounder. These fisheries are managed primarily using output controls (catch and landings limits). The Council's Scientific and Statistical Committee (SSC) recommends annual Acceptable Biological Catch (ABC) levels for summer flounder. The ABC is divided into commercial and recreational Annual Catch Limits (ACLs), which include both allowable landings and expected dead discards. Currently, 60% of the total allowable landings (calculated by subtracting total expected dead discards from the ABC) are allocated to the commercial fishery as a commercial quota and 40% allocated to the recreational fishery as an RHL. In December 2021, the Council and Commission revised the commercial/recreational allocation such that 55% of the ABC will be allocated to the commercial fishery and 45% to the recreational fishery. This represents a change from a landings-based allocation to a catch-based allocation, such that the allocation will be applied directly to the ABC instead of to the total allowable landings. These changes are pending review by NMFS and if approved, are expected to be effective January 1, 2023.¹

Fishery Landings Summary

Table 2 shows summer flounder catch and landings limits from 2012 through 2023, as well as commercial and recreational landings through 2021. Total (commercial and recreational combined) summer flounder landings generally declined throughout the early 1980s, and increased again in the mid-2000s before dropping to a time series low of 13.74 million lb in 2018 (Figure 3).^{4,5}

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 estimates of catch and landings are several times higher than the

¹ For more information on these allocation revisions, see the fact sheet at: <https://www.mafmc.org/s/SFSBSB-Allocation-FAQs.pdf>.

previous estimates for shore and private boat modes. All recreational estimates in this document reflect revised MRIP estimates except where otherwise noted.

Recreational harvest estimates for 2020 were impacted by temporary suspension of shoreside intercept surveys due to the COVID-19 pandemic. NMFS used imputation methods to fill gaps in 2020 catch data with data collected in 2018 and 2019. These proxy data match the time, place, and fishing mode combinations that would have been sampled had the intercept surveys continued uninterrupted. Proxy data were combined with observed data to produce 2020 catch estimates using the standard estimation methodology. NMFS previously indicated that 2020 data may be revised based on potential incorporation of 2021 data into these imputation methods; as of completion of this document no updates have been made. Commercial landings reporting in 2020 continued uninterrupted.

Table 2: Summary of catch limits, landings limits, and landings for commercial and recreational summer flounder fisheries from 2012 through 2023. Values are in millions of pounds.

Measures	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 ^d
ABC	25.58	22.34	21.94	22.57	16.26	11.30	13.23	25.03	25.03	27.11	33.12	33.12
Commercial ACL	14.00	12.11	12.87	13.34	9.43	6.57	7.70	13.53	13.53	14.63	18.48	18.48
Commercial quota ^{a,b}	12.73	11.44	10.51	11.07	8.12	5.66	6.63	10.98	11.53	12.49	15.53	15.53
Commercial landings	13.05	12.56	11.00	10.71	7.80	5.87	6.17	9.06	9.12	10.36	--	--
% of commercial quota landed	102%	110%	105%	97%	96%	104%	93%	83%	79%	83%	--	--
Recreational ACL	11.58	10.23	9.07	9.44	6.84	4.72	5.53	11.51	11.51	12.48	14.64	14.64
Recreational harvest limit ^a	8.49	7.63	7.01	7.38	5.42	3.77	4.42	7.69	7.69	8.32	10.36	10.36
Harvest - OLD MRIP	6.49	7.36	7.39	4.72	6.18	3.19	3.35	--	--	--	--	--
Harvest - NEW MRIP	16.13	19.41	16.23	11.83	13.24	10.09	7.60	7.80	10.06	6.82	--	--
% of RHL landed ^c	76%	96%	105%	64%	114%	85%	76%	101%	131% ^d	82%	--	--

^a For 2012-2014, commercial quotas and RHLs are adjusted for Research Set Aside (RSA). Quotas and RHLs for 2015-2023 do not reflect an adjustment for RSA due to the suspension of the program in 2014.

^b Commercial quotas also reflect deductions from prior year landings overages and discard-based Accountability Measures.

^c The revised MRIP data cannot be compared to RHLs prior to 2019, given that these limits were set based on an assessment that used previous MRIP data. For the comparison of harvest to the RHL, old MRIP values are used for 2012-2018 and revised MRIP values are used for 2019-2021.

^d Previously adopted limits for 2023 will be reviewed in 2022 by the SSC, Monitoring Committee, and Council/Commission. Sector-specific limits including the commercial and recreational ACLs, RHL, and commercial quota are expected to be revised given recently adopted changes to the commercial/recreational allocation, expected to be effective January 1, 2023.

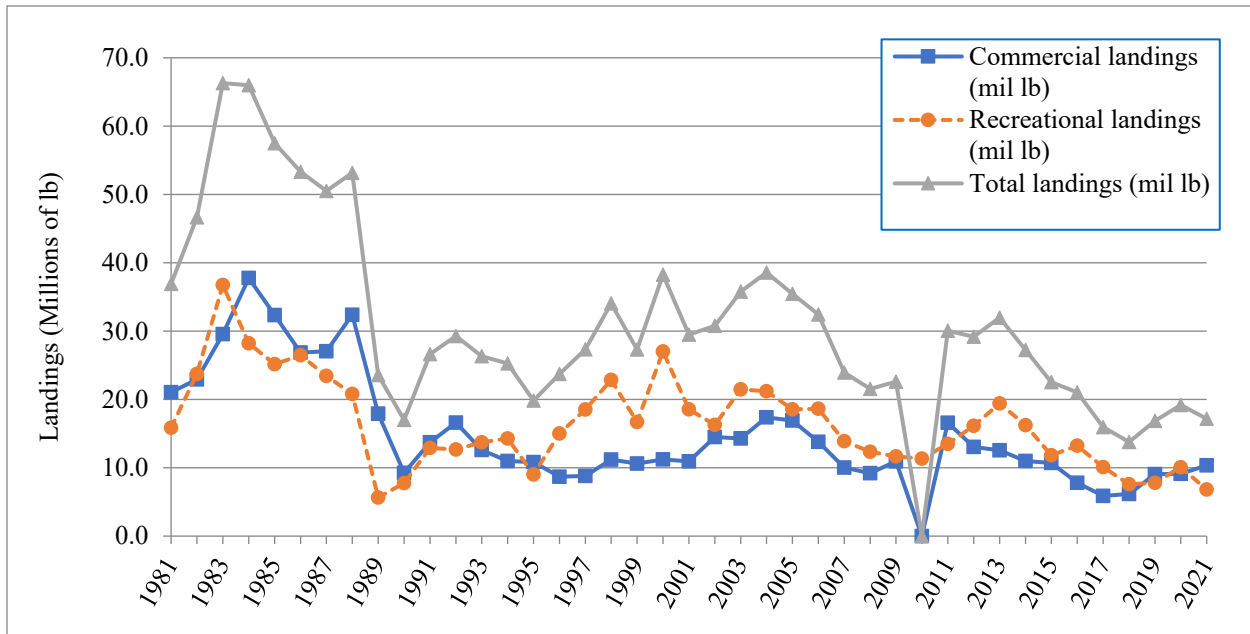


Figure 3: Commercial and recreational summer flounder landings in millions of pounds, Maine-North Carolina, 1981-2021.⁵

Commercial Fishery

Commercial landings of summer flounder peaked in 1984 at 37.77 million pounds and reached a low of 5.87 million pounds in 2017 (Figure 3). In 2021, commercial fishermen from Maine through North Carolina landed 10.36 million pounds of summer flounder, about 83% of the commercial quota (12.49 million pounds; Table 2).⁴

Since 1993, a moratorium permit has been required to fish commercially for summer flounder in federal waters. In 2021, 711 vessels held such permits.⁶

The commercial quota is divided among the states based on the allocation percentages specified in the FMP. Each state sets measures to achieve their state-specific commercial quotas. Two or more states may transfer or combine their summer flounder commercial quota under mutual agreement and with the approval of the NMFS Regional Administrator. The commercial allocations to the states were modified via Amendment 21, which became effective on January 1, 2021. The revised allocation system modifies the state-by-state commercial quota allocations in years when the annual coastwide commercial quota exceeds the specified trigger of 9.55 million pounds. Annual coastwide commercial quota of up to 9.55 million pounds is distributed according to the previous state allocations (Table 3). In years when the coastwide quota exceeds 9.55 million pounds, the *additional* quota amount beyond this trigger will be distributed by equal shares to all states except Maine, Delaware, and New Hampshire, which would split 1% of the additional quota (Table 3). The total percentage allocated annually to each state is dependent on how much additional quota beyond 9.55 million pounds, if any, is available in any given year. This allocation system is designed to provide for more equitable distribution of quota when stock biomass is higher, while also considering the historic importance of the fishery to each state.

Table 3: Current (effective January 2021) allocation of summer flounder commercial quota to the states.

State	Total state commercial quota allocation = baseline quota allocation + additional quota allocation	
	Allocation of baseline quota ≤9.55 mil lb	Allocation of additional quota beyond 9.55 mil lb
ME	0.04756%	0.333%
NH	0.00046%	0.333%
MA	6.82046%	12.375%
RI	15.68298%	12.375%
CT	2.25708%	12.375%
NY	7.64699%	12.375%
NJ	16.72499%	12.375%
DE	0.01779%	0.333%
MD	2.03910%	12.375%
VA	21.31676%	12.375%
NC	27.44584%	12.375%
Total	100%	100%

For 1994 through 2021, NMFS dealer data indicate that summer flounder total ex-vessel revenue from Maine to North Carolina ranged from a low of \$14.28 million in 1996 to a high of \$31.76 million in 2015 (values adjusted to 2021 dollars to account for inflation). The mean price per pound ranged from a low of \$1.34 in 2002 to a high of \$4.22 in 2017 (both values in 2021 dollars). In 2021, 10.36 million pounds of summer flounder were landed generating \$30.18 million in total ex-vessel revenue (an average of \$2.91 per pound; Figure 4).⁴

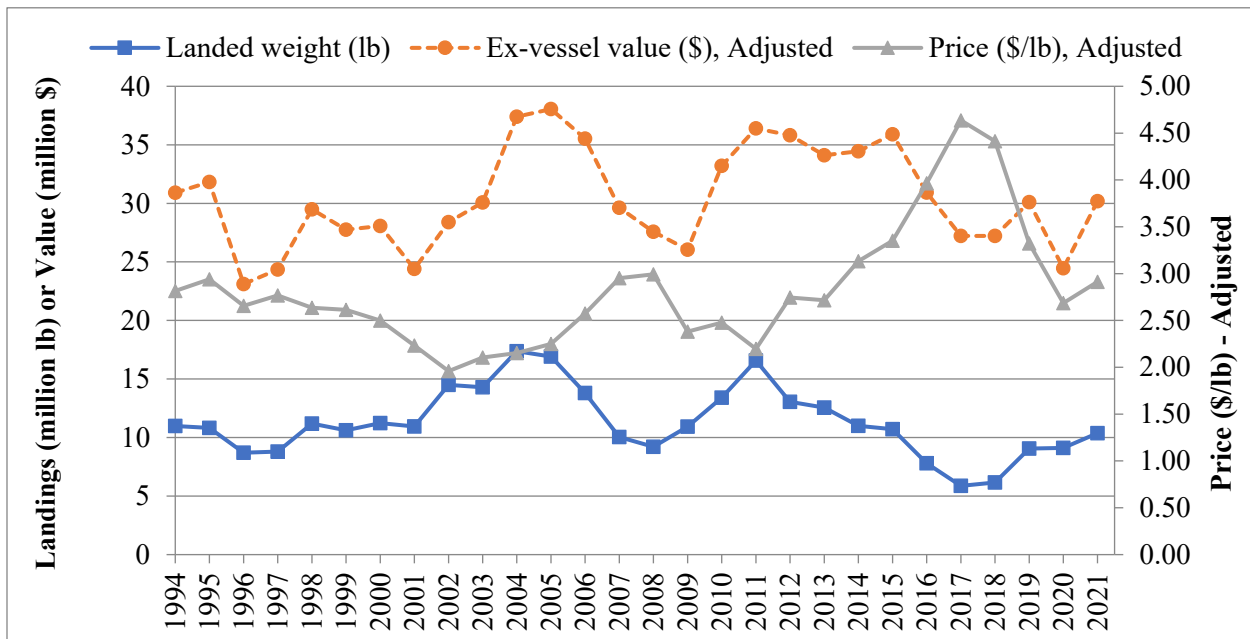


Figure 4: Landings, ex-vessel value, and price per pound for summer flounder, Maine through North Carolina, 1994-2021. Ex-vessel value and price are adjusted to real 2021 dollars using the Gross Domestic Product Price Deflator (GDPDEF).⁴

VTR data indicate that 99% of summer flounder landings in 2021 were taken by bottom otter trawls.⁷ Current regulations require a 14-inch total length minimum fish size in the commercial fishery. Trawl nets are required to have 5.5-inch diamond or 6-inch square minimum mesh in the entire net for vessels possessing more than the threshold amount of summer flounder (i.e., 200 lb from November 1-April 30 and 100 lb from May 1-October 31).

According to federal VTR data, statistical areas 537 and 616 were responsible for the highest percentage of commercial summer flounder catch in 2021 (30% and 24% respectively; Table 4). While statistical area 539 accounted for only 5% of 2021 summer flounder catch, this area had the highest number of trips that caught summer flounder (2,177 trips; Table 4; Figure 5).⁷

Over 164 federally permitted dealers from Maine through North Carolina bought summer flounder in 2021. More dealers from New York bought summer flounder than any other state (Table 5). All dealers combined bought approximately \$30.18 million worth of summer flounder in 2021.⁴

At least 100,000 pounds of summer flounder were landed by commercial fishermen in 16 ports in 8 states in 2021. These ports accounted for 90% of all 2021 commercial summer flounder landings. Point Judith, RI and Beaufort, NC were the leading ports in 2021 in pounds of summer flounder landed, while Point Judith, RI was the leading port in number of vessels landing summer flounder (Table 6).⁴ Detailed community profiles developed by the Northeast Fisheries Science Center’s Social Science Branch can be found at www.mafmc.org/communities/.

Table 4: Statistical areas that accounted for at least 5% of the total summer flounder catch in 2021, with associated number of trips.⁷ Federal VTR data do not capture landings by vessels only permitted to fish in state waters.

Statistical Area	Percent of 2021 Commercial Summer Flounder Catch	Number of Trips
537	30%	1,362
616	24%	756
613	17%	1,521
539	5%	2,177
612	5%	899

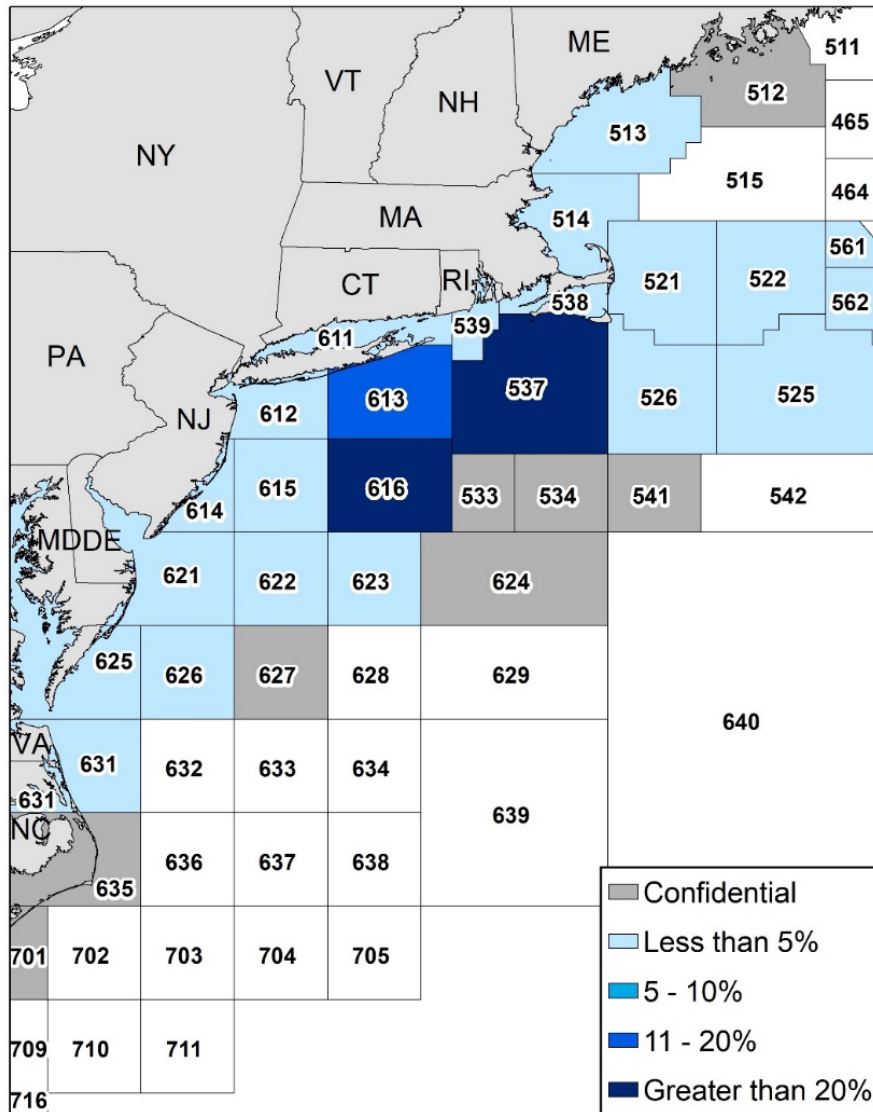


Figure 5: Proportion of commercial summer flounder catch (all vessel reported landings and discards) by NMFS statistical area in 2021 based on federal VTR data. Statistical areas marked “confidential” are associated with fewer than three vessels and/or dealers. The amount of catch not reported on federal VTRs (e.g., catch from vessels permitted to fish only in state waters) is unknown.⁷

Table 5: Number of dealers per state which reported purchases of summer flounder in 2021. C = Confidential.⁴

State	NH	MA	RI	CT	NY	NJ	DE	MD	VA	NC
# of Dealers	C	25	20	14	46	27	0	4	12	16

Table 6: Ports reporting at least 100,000 pounds of commercial summer flounder landings in 2021, based on dealer data.⁴

Port	Commercial summer flounder landings (lb)	% of total	Number of vessels
POINT JUDITH, RI	1,748,523	17%	128
BEAUFORT, NC	1,434,811	14%	47
PT. PLEASANT, NJ	1,174,359	11%	48
HAMPTON, VA	965,319	9%	47
NEWPORT NEWS, VA	620,942	6%	32
MONTAUK, NY	609,729	6%	67
STONINGTON, CT	393,382	4%	19
NEW BEDFORD, MA	372,109	4%	59
CAPE MAY, NJ	352,130	3%	35
OCEAN CITY, MD	345,249	3%	18
ENGELHARD, NC	240,539	2%	5
WANCHESE, NC	207,119	2%	7
BELFORD, NJ	194,955	2%	15
HAMPTON BAYS, NY	191,819	2%	28
EAST HAVEN, CT	174,107	2%	9
LONG BEACH/ BARNEGAT LIGHT, NJ	165,919	2%	12
CHINCOTEAGUE, VA	147,434	1%	14

Recreational Fishery

There is a significant recreational fishery for summer flounder, primarily in state waters when the fish migrate inshore during the warm summer months. The Council and Commission determine annually whether to manage the recreational fishery under coastwide measures or conservation equivalency. Under conservation equivalency, state- or region- specific measures are developed through the Commission’s management process and submitted to NMFS. The combined state or regional measures must achieve the same level of harvest as a set of coastwide measures developed to adhere to the overall RHL. If NMFS considers the combination of the state- or region- specific measures to be "equivalent" to the coastwide measures, they may then waive regulations in federal waters. Anglers fishing in federal waters are then subject to the measures of the state in which they land summer flounder.

The recreational fishery has been managed using federal conservation equivalency each year since 2001. Since 2014, a regional approach has been used, under which the states within each region must have identical size limits, possession limits, and season length. Table 7 shows the 2021 and 2022 regional conservation equivalency measures. Measures were adjusted in 2022 to allow for up to a 16.5% liberalization in harvest, given the increase in the RHL between 2021 and 2022 and because recent harvest estimates have been well below the 2022 RHL.

Table 7: Summer flounder recreational fishing measures 2021-2022, by state, under regional conservation equivalency. Conservation equivalency regions (highlighted in alternating colors) include: 1) Massachusetts, 2) Rhode Island, 3) Connecticut and New York, 4) New Jersey, 5) Delaware, Maryland, The Potomac River Fisheries Commission, and Virginia, and 6) North Carolina.

State	2021			2022		
	Minimum Size (inches)	Possession Limit	Open Season	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	17	5 fish	May 23-October 9	16.5	5 fish	May 21-September 19
Rhode Island (Private, For-Hire, and all other shore-based fishing sites)	19	6 fish	May 3-December 31	18	4 fish	May 3-December 31
RI 7 designated shore sites	19	4 fish ^a		18	2 fish ^a	
	17	2 fish ^a		17	2 fish ^a	
Connecticut	19	4 fish	May 4-September 30	18.5	4 fish	May 1-October 9
CT Shore Program (45 designated shore sites)	17			17		
New York	19			18.5		
New Jersey	18	3 fish	May 22-September 19	17-17.99 slot limit	2 fish	May 2-September 27
NJ Shore program site (ISBSP)	16	2 fish		18	1 fish	
New Jersey/Delaware Bay COLREGS	17	3 fish		16	2 fish	
				17	3 fish	
Delaware	16.5	4 fish	January 1-December 31	16	4 fish	January 1-December 31
Maryland						
PRFC						
Virginia						
North Carolina	15	4 fish	August 16-September 30 ^b	15	1 fish	September 1-September 30 ^b

^a Rhode Island's shore program includes a combined possession limit of 6 fish, no more than 2 fish at 17-inch minimum size limit.

^b North Carolina has restricted their recreational season in recent years for all flounders in North Carolina (southern, gulf, and summer flounder) due to the need to end overfishing on southern flounder. North Carolina manages all flounder in the recreational fishery under the same regulations.

MRIP estimates indicate that recreational catch (harvest plus live and dead discards) for summer flounder peaked in 2010 with 58.89 million fish caught. Recreational harvest peaked in 1983, with 25.78 million fish landed, totaling 36.74 million pounds. Recreational catch was lowest in 1989 with 5.06 million fish caught. Recreational harvest in numbers of fish reached a low in 2021 with 2.32 million fish landed (6.82 million pounds), while recreational harvest in pounds was lowest in 1989 at 5.66 million pounds (3.10 million fish); Figure 6).⁵

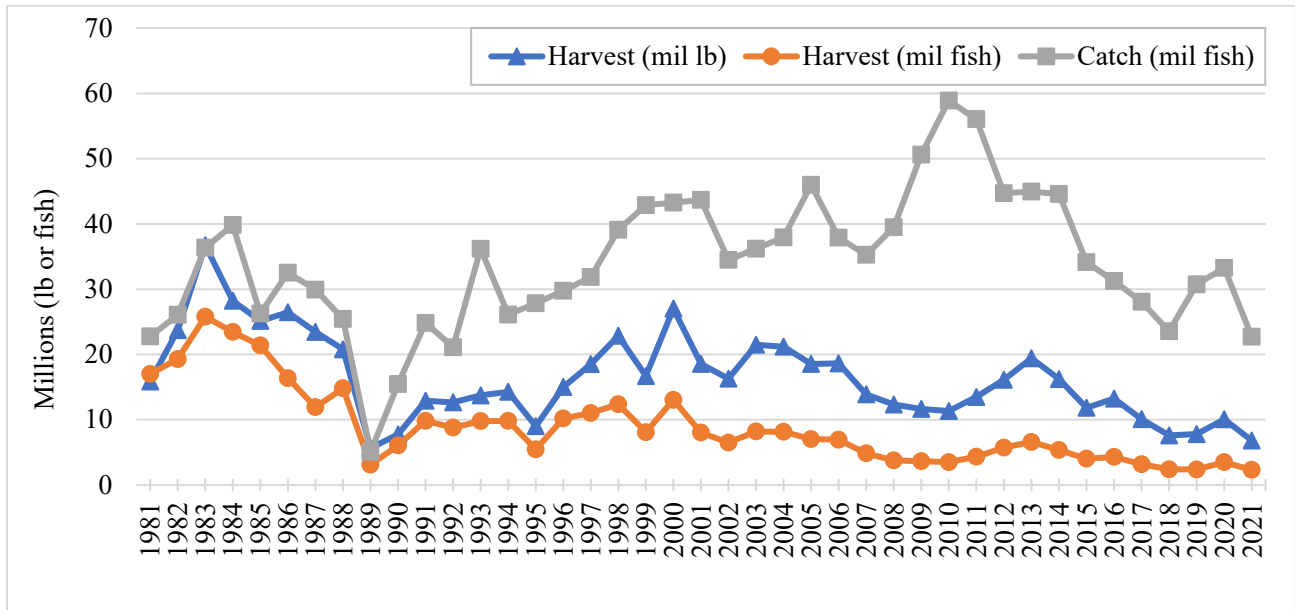


Figure 6: MRIP estimates of recreational summer flounder harvest in numbers of fish and pounds and catch in numbers of fish, ME - NC, 1981-2021.⁵

For-hire vessels carrying passengers in federal waters must obtain a federal party/charter permit. In 2021, 904 vessels held summer flounder federal party/charter permits.⁶ Many of these vessels also hold recreational permits for scup and black sea bass.

On average, an estimated 77% of the recreational landings (in numbers of fish) occurred in state waters over the past ten years (Table 8). Most summer flounder are typically landed in New York and New Jersey (Table 9).⁵

About 86% of recreational summer flounder harvest from 2019-2021 was from anglers who fished on private or rental boats. About 4% was from party or charter boats, and about 10% was from anglers fishing from shore. The revised MRIP methodology resulted in an increase in the amount of harvest estimated to occur from private and shore modes while making only minor changes to the estimates for party/charter modes, modifying the percentages attributable to each mode (Table 10).⁵

Table 8: Estimated percentage of summer flounder recreational landings (in numbers of fish) from state vs. federal waters, Maine through North Carolina, 2012-2021.⁵

Year	State ≤ 3 mi	EEZ > 3 mi
2012	86%	14%
2013	77%	23%
2014	78%	22%
2015	82%	18%
2016	79%	21%
2017	79%	21%
2018	83%	17%
2019	77%	23%
2020	61%	39%
2021	66%	34%
Avg. 2012- 2021	77%	23%
Avg. 2019 - 2021	69%	31%

Table 9: State contribution (as a percentage) to total recreational landings of summer flounder (in numbers of fish), from Maine through North Carolina, 2019-2021.⁵

State	2019	2020	2021	2019-2021 average
Maine	0%	0%	0%	0%
New Hampshire	0%	0%	0%	0%
Massachusetts	2%	2%	2%	2%
Rhode Island	9%	3%	2%	6%
Connecticut	4%	4%	5%	4%
New York	24%	21%	15%	23%
New Jersey	46%	57%	58%	50%
Delaware	4%	6%	4%	5%
Maryland	3%	2%	3%	3%
Virginia	6%	4%	10%	5%
North Carolina	1%	1%	1%	1%
Total	100%	100%	100%	100%

Table 10: The percent of summer flounder landings (in number of fish) by recreational fishing mode, Maine through North Carolina, 2012-2021.⁵

Year	Shore	Party/Charter	Private/Rental	Total number of fish landed (millions)
2012	9%	3%	88%	5.74
2013	11%	4%	85%	6.60
2014	7%	8%	84%	5.36
2015	7%	7%	86%	4.03
2016	8%	4%	89%	4.30
2017	13%	4%	83%	3.17
2018	11%	6%	84%	2.41
2019	10%	3%	87%	2.38
2020	18%	2%	80%	3.49
2021	11%	7%	82%	2.32
% of Total, 2012-2021	10%	4%	86%	--
% of Total, 2019-2021	13%	4%	83%	--

References

¹ Packer, D. B, S. J. Griesbach, P. L. Berrien, C. A. Zetlin, D. L. Johnson, and W.W. Morse. 1999. Essential Fish Habitat Source Document: Summer Flounder, *Paralichthys dentatus*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-151.

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⁴ Unpublished NMFS dealer data as of February 1, 2022.

⁵ Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division. Accessed May 3, 2022. Available at: <http://www.st.nmfs.noaa.gov/recreational-fisheries/index>.

⁶ Unpublished NMFS permit data as of February 1, 2022.

⁷ Unpublished NMFS Vessel Trip Report (VTR) data as of February 1, 2022.