Summer Flounder Fishery Information Document

August 2019

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 2018. Data sources include unpublished National Marine Fisheries Service (NMFS) survey, dealer, vessel trip report (VTR), permit, and Marine Recreational Information Program (MRIP) databases and should be considered preliminary. For more resources on summer flounder management, including previous Fishery Information Documents, please visit http://www.mafmc.org/sf-s-bsb.

Key Facts:

- The 2018 benchmark stock assessment found that in 2017, summer flounder was not overfished and overfishing was not occurring (in contrast to the last assessment which found overfishing was occurring).
- Incorporation of a revised time series of recreational data from MRIP contributed to an increase in estimated stock biomass compared to the previous assessment.
- Commercial and recreational landings in 2018 were among the lowest in the time series.
- Commercial price per pound has been increasing since 2011 and remained well above average in 2018 at $4.11 per pound.
- MRIP revisions resulted in a higher proportion of estimated recreational harvest from the private and shore modes and a decrease in estimated harvest from the for-hire fishery.

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 fish (likely a male) estimated to be age 20. Also sampled were two age 17 fish, at 52 cm (likely a male) and at 72 cm (likely a female). Two large (likely female) fish at 80 and 82 cm 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

The most recent benchmark summer flounder stock assessment was completed and reviewed during the 66th Stock Assessment Workshop and Stock Assessment Review Committee (SAW/SARC 66) in November 2018.[3] This assessment uses a statistical catch at age model (the age-structured assessment program, or "ASAP" model). Stock assessment and peer review reports are available online at the Northeast Fisheries Science Center (NEFSC) website: http://www.nefsc.noaa.gov/saw/reports.html.

The assessment incorporated the revised time series of recreational catch from MRIP, which is 30% higher on average compared to the previous summer flounder estimates for 1981-2017. The MRIP estimate revisions account for changes in both the angler intercept survey and recreational effort survey methodologies. While fishing mortality rates were not strongly affected by incorporating these revisions, increased recreational catch resulted in increased estimates of stock size compared to past assessments.

The biological reference points for summer flounder as revised through the recent benchmark assessment are described in Table 1.

Table 1: Summary of biological reference points and terminal year SSB and F estimates from the 2018 benchmark stock assessment.

	SAW/SARC 66 (2018) Biological Reference Points and stock status results (data through 2017)
SSB_{MSY} (biomass target)	126.01 mil lb (57,159 mt)
½ SSB_{MSY} (minimum stock size, or overfished, threshold)	63.01 mil lb (28,580 mt)
Terminal year SSB (2017)	98.22 mil lb (44,552 mt) 78% of SSB_{MSY} **(not overfished)**
$F_{MSY\ PROXY}$ = $F_{35\%}$ (overfishing threshold)	0.448
Terminal year F (2017)	0.334 25% below F_{MSY} (**not overfishing**)

Assessment results indicate that the summer flounder stock was not overfished and overfishing was not occurring in 2017 relative to the biological reference points. 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 has increased, and in 2017 was estimated at 0.334, below the SAW 66 F_{MSY} proxy = $F_{35\%}$ = 0.448 (Figure 1). The 90% confidence interval for F in 2017 was 0.276 to 0.380.

SSB decreased from 67.13 million lb (30,451) mt in 1982 to 16.33 million lb (7,408) mt in 1989, and then increased to 152.46 million lb (69,153) mt in 2003. SSB has decreased since 2003 and was estimated to be 98.22 million lb (44,552 mt) in 2017, about 78% of SSB_{MSY} = 126.01 million lb (57,159 mt), and 56% above the ½ SSB_{MSY} proxy = ½ $SSB_{35\%}$ = 63.01 million lb (28,580 mt; Figure 2). The 90% confidence interval for SSB in 2017 was 39,195 to 50,935 mt.

Recruitment of juvenile summer flounder to the fishery has been below average since about 2011 (Figure 2), although the driving factors behind this trend have not been identified. Bottom trawl survey data also indicate a recent trend of decreasing length and weight at age, which implies slower growth and delayed maturity. These factors affected the change in biological reference points used to determine stock status.

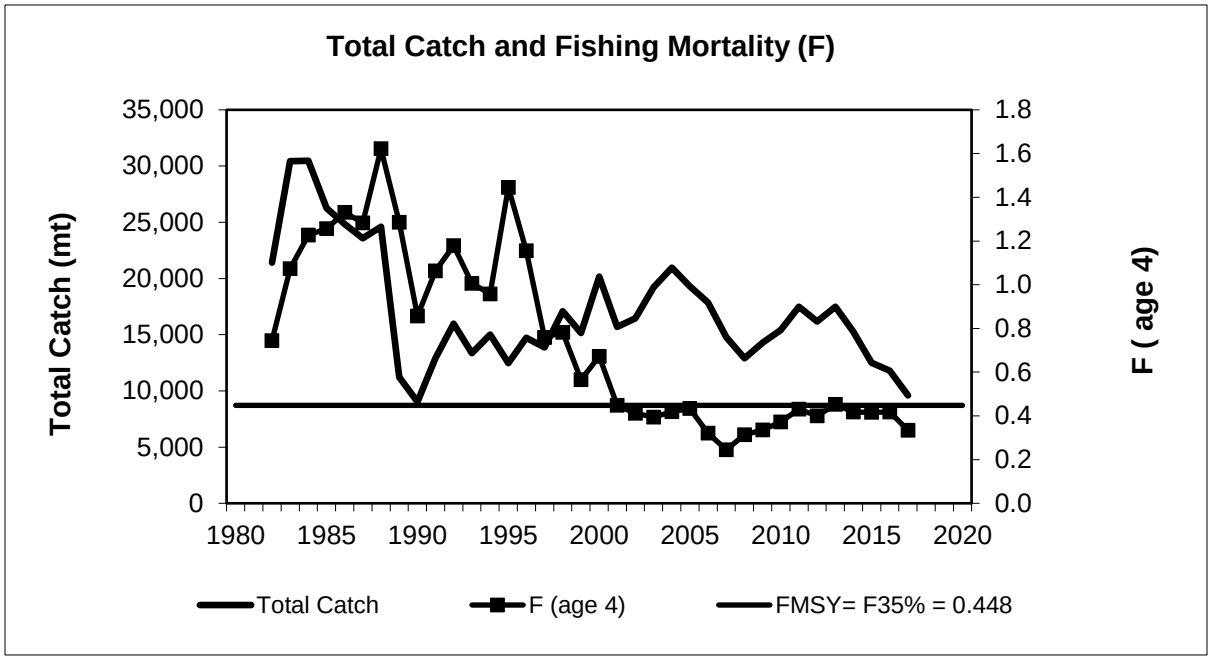

Figure 1: Total fishery catch (mt; solid line) and fully-recruited fishing mortality (F, peak at age 4; squares) of summer flounder. The horizontal solid line is the 2018 SAW66 recommended fishing mortality reference point proxy FMSY = F35% = 0.448.[3]

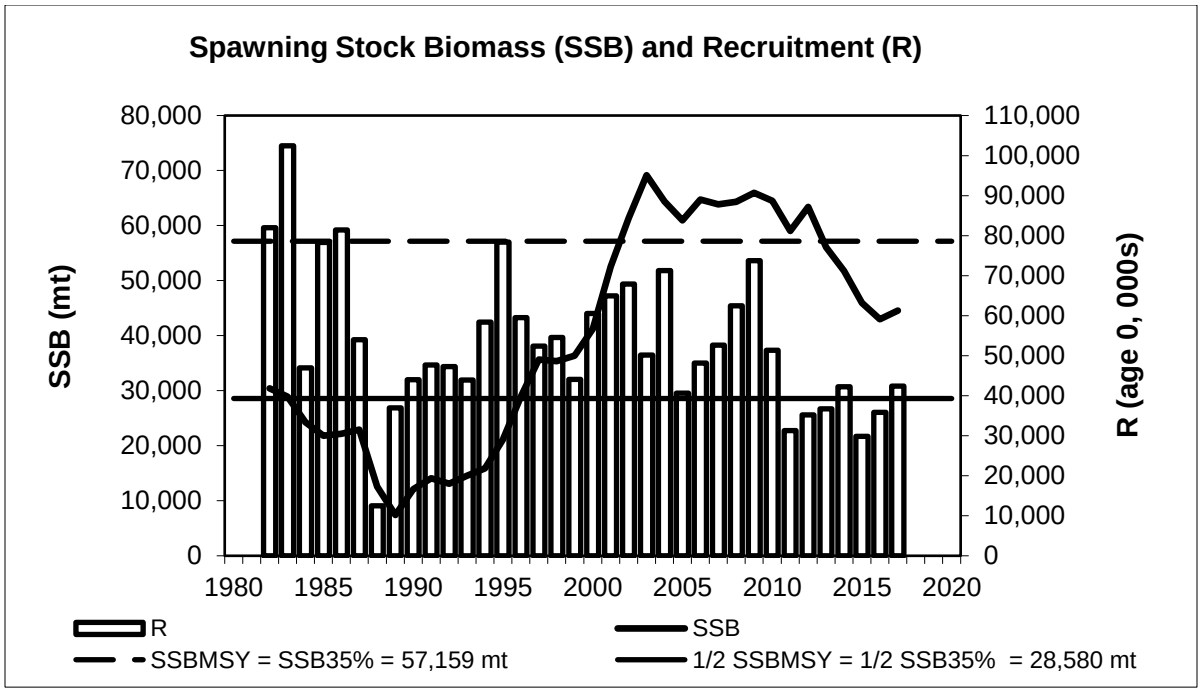

Figure 2: Summer flounder spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars) 1980-2017. The horizontal dashed line is the 2018 SAW66 recommended target biomass reference point proxy, $SSB_{MSY} = SSB_{35\%} = 57{,}159$ mt. The horizontal solid line is the 2018 SAW66 recommended threshold biomass reference point proxy $½\ SSB_{MSY} = ½\ SSB_{35\%} = 28{,}580$ mt.[3]

Management System and Fishery Performance

Management

The Mid-Atlantic Fishery Management Council (Council) and the Atlantic States Marine Fisheries Commission (Commission or ASMFC) 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 in the western Atlantic Ocean 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, minimum fish sizes, gear regulations, permit requirements, and other provisions as prescribed by the FMP.

There are large commercial and recreational fisheries for summer flounder. These fisheries are managed primarily using output controls (catch and landings limits), with 60 percent of the landings being allocated to the commercial fishery as a commercial quota and 40 percent allocated to the recreational fishery as a recreational harvest limit. Management also uses minimum fish sizes, 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.

The Council's Scientific and Statistical Committee (SSC) recommends annual Acceptable Biological Catch (ABC) levels for summer flounder, which are then approved by the Council and Commission and submitted to NMFS for final approval and implementation. The ABC is divided into commercial and recreational Annual Catch Limits (ACLs), based on the landings allocation prescribed in the FMP and the recent distribution of discards between the commercial and recreational fisheries. The Council first implemented recreational and commercial ACLs, with a system of overage accountability, in 2012. Both the ABC and the ACLs are catch limits (i.e., include both projected landings and discards), while the commercial quota and the recreational harvest limit are landing limits.

Table 2 shows summer flounder catch and landings limits from 2008 through 2019, as well as commercial and recreational landings through 2018.

Total (commercial and recreational combined) summer flounder landings, taking into account the revised recreational data from MRIP, generally declined throughout the early 1980s, dropping to a time series low of 13.74 million lb in 2018 (Figure 3).[4,5]

Table 2: Summary of catch limits, landings limits, and landings for commercial and recreational summer flounder fisheries from 2008 through 2019 (revised). Values are in millions of pounds unless otherwise noted.

Management measures	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019[a]
ABC	--	21.50	25.5	33.95	25.58	22.34	21.94	22.57	16.26	11.30	13.23	25.03
Commercial ACL	--	--	--	--	14.00	12.11	12.87	13.34	9.43	6.57	7.70	13.53
Commercial quota[b,c]	9.32	10.74	12.79	17.38	12.73	11.44	10.51	11.07	8.12	5.66	6.63	10.98
Commercial landings	9.21	10.94	13.04	16.56	13.03	12.49	11.07	10.68	7.81	5.83	6.14	--
% of commercial quota landed	99%	102%	102%	95%	102%	109%	105%	96%	96%	103%	93%	--
Recreational ACL	--	--	--	--	11.58	10.23	9.07	9.44	6.84	4.72	5.53	11.51
Recreational harvest limit [b]	6.21	7.16	8.59	11.58	8.49	7.63	7.01	7.38	5.42	3.77	4.42	7.69
Harvest - OLD MRIP	8.15	6.03	5.11	5.96	6.49	7.36	7.39	4.72	6.18	3.19	3.35	--
% Over/Under RHL (Old MRIP)[d]	131%	84%	59%	51%	76%	96%	105%	64%	114%	85%	76%	--
Harvest - NEW MRIP	12.34	11.66	11.34	13.48	16.13	19.41	16.24	11.83	13.24	10.06	7.60	--

[a] As revised via interim final rule on May 17, 2019 (84 FR 22393), based on the 2018 benchmark stock assessment.
[b] For 2008-2014, commercial quotas and RHLs are adjusted for Research Set Aside (RSA). Quotas and harvest limits for 2015-2019 do not reflect an adjustment for RSA due to the suspension of the program in 2014.
[c] Commercial quotas also reflect deductions from prior year landings overages and discard-based Accountability Measures.

[d] The revised MRIP data cannot be compared to past RHLs given that these limits were set based on an assessment that used previous MRIP data.

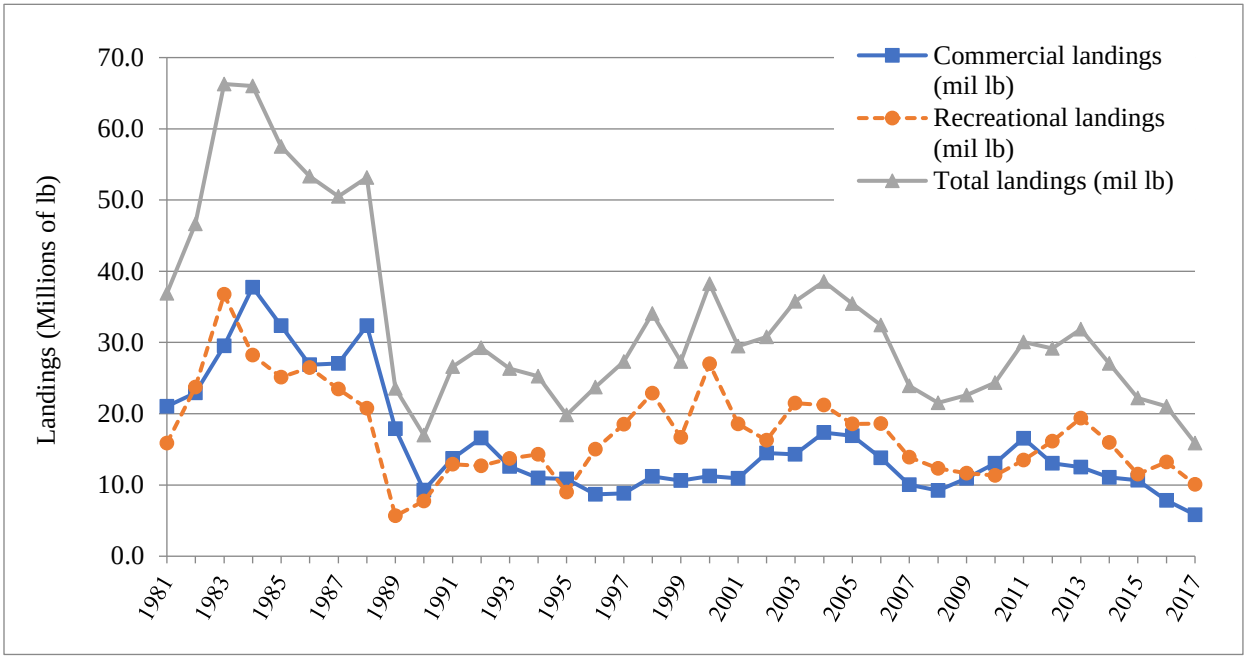

Figure 3: Commercial and recreational summer flounder landings in millions of pounds, Maine-North Carolina, 1980-2018. Recreational landings are based on revised MRIP data.[4,5]

Commercial Fishery

Commercial landings of summer flounder peaked in 1984 at 37.77 million pounds, and reached a low of 5.83 million pounds in 2017. In 2018, commercial fishermen from Maine through North Carolina landed 6.14 million pounds of summer flounder, about 93% of the commercial quota (6.63 million pounds after deductions for prior year landings and discard overages;

Table 2). Total ex-vessel value in 2018 was $25.27 million, resulting in an average price per pound of $4.11 (Figure 4).

A moratorium permit is required to fish commercially for summer flounder in federal waters. In 2018, 741 vessels held such permits.[6]

The commercial quota is divided among the states based on the allocation percentages given in Table 3 and each state sets measures to achieve their state-specific commercial quotas. The Council and ASFMC recently approved modifications to the commercial allocations through a Summer Flounder Commercial Issues Amendment (see: http://www.mafmc.org/actions/summer-flounder-amendment). A summary of the commercial allocation changes is available at: http://www.mafmc.org/s/SF-Allocation-Revisions-Fact-Sheet-March-2019.pdf. These changes are pending implementation by the National Marine Fisheries Service, and if approved, are expected to take effect on January 1, 2021.

Table 3: State-by-state percent share of commercial summer flounder allocation.

State	Allocation (%)
ME	0.04756
NH	0.00046
MA	6.82046
RI	15.68298
CT	2.25708
NY	7.64699
NJ	16.72499
DE	0.01779
MD	2.03910
VA	21.31676
NC	27.44584
Total	100

For 1994 through 2018, NMFS dealer data indicate that summer flounder total ex-vessel revenue from Maine to North Carolina ranged from a low of $9.47 million in 1996 to a high of $30.02 million in 2015 (values adjusted to 2018 dollars to account for inflation). The mean price per pound for summer flounder ranged from a low of $0.99 in 2002 (in 2018 dollars) to a high of $4.13 in 2017. In 2018, 6.14 million pounds of summer flounder were landed generating $25.27 million in total ex-vessel revenue (an average of $4.11 per pound; Figure 4).[4]

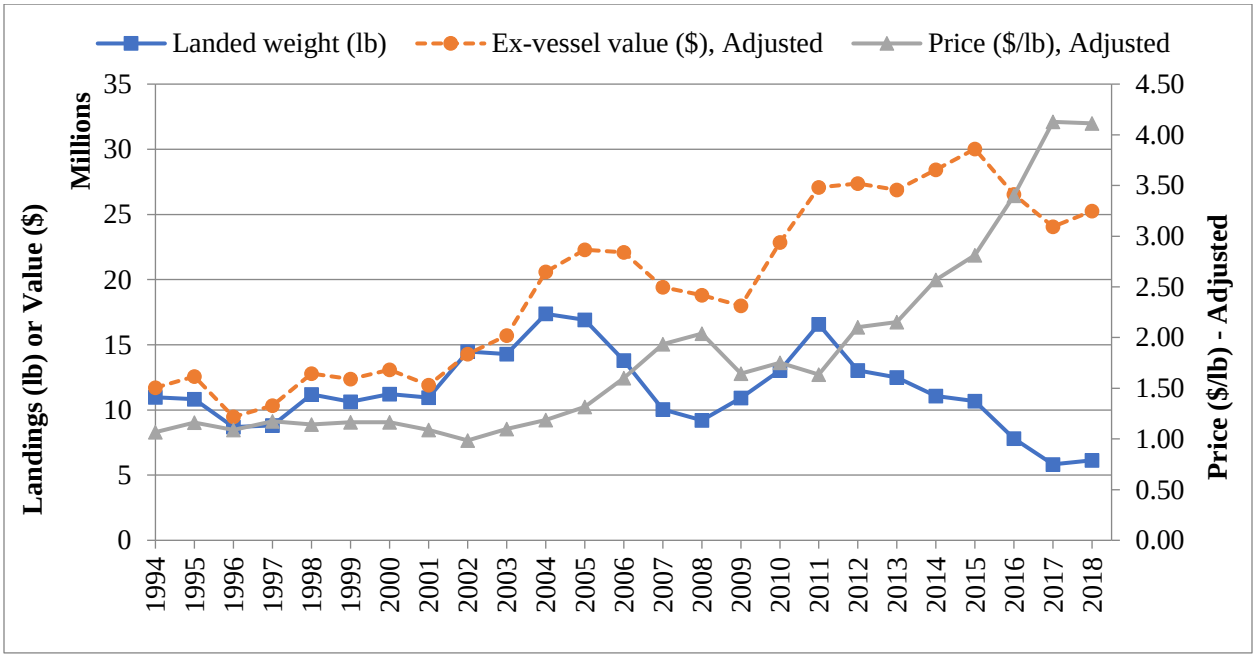

Figure 4: Landings, ex-vessel value, and price per pound for summer flounder, Maine through North Carolina, 1994-2018. Ex-vessel value and price are adjusted to real 2018 dollars using the Gross Domestic Product Price Deflator (GDPDEF).[4]

VTR data for 2018 indicate that the bulk of the summer flounder landings were taken by bottom otter trawls (96 percent). All other gear types each accounted for less than 1 percent of landings.[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).

VTR data were also used to identify all NMFS statistical areas that accounted for more than 5 percent of the summer flounder commercial catch in 2018 (Table 4; Figure 5). Statistical areas 616 and 537 were responsible for the highest percentage of the catch (34% and 17% respectively; Table 4). While statistical area 539 accounted for only 6% of 2018 summer flounder catch, this area had the highest number of trips that caught summer flounder (2,473 trips).[7] Note that discards on VTRs are self-reported.

At least 100,000 pounds of summer flounder were landed by commercial fishermen in 14 ports in 7 states in 2018. These ports accounted for 81% of all 2018 commercial summer flounder landings. Beaufort, NC and Point Judith, RI were the leading ports in 2018 in pounds of summer flounder landed, while Point Judith, RI was the leading port in number of vessels landing summer flounder (Table 5).[4]

Over 200 federally permitted dealers from Maine through North Carolina bought summer flounder in 2018. More dealers bought summer flounder in New York than in any other state (

Table 6). All dealers combined bought approximately $25.27 million worth of summer flounder in 2018.[4]

Table 4: Statistical areas that accounted for at least 5 percent of the total summer flounder catch in 2018, with associated number of trips.[7]

Statistical Area	Percent of 2018 Commercial Summer Flounder Catch	Number of Trips
616	34%	1,062
537	17%	1,199
613	13%	1,553
612	6%	1,281
539	6%	2,473
622	6%	263

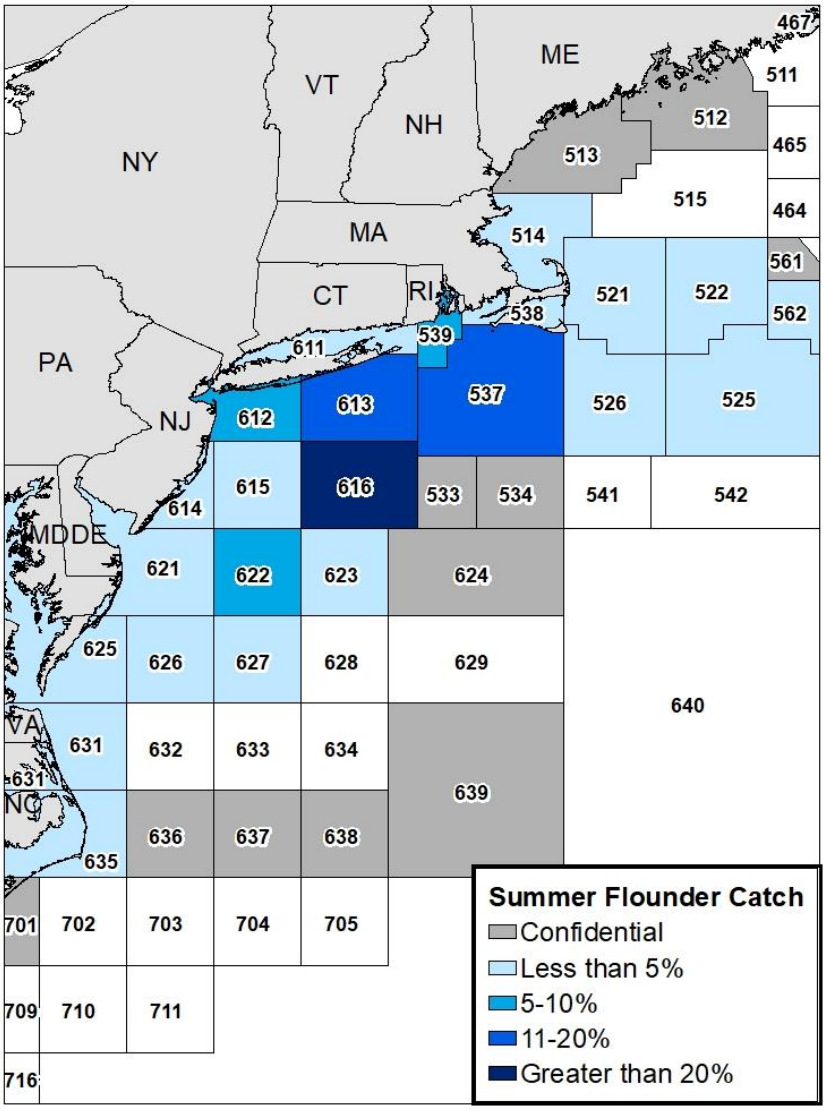

Figure 5: NMFS statistical areas showing percent of total commercial summer flounder catch in 2018, according to VTR data.[7]

Table 5: Ports reporting at least 100,000 pounds of commercial summer flounder landings in 2018, based on dealer data.[4]

Port	Commercial summer flounder landings (lb)	% of total 2018 commercial summer flounder landings	Number of vessels landings summer flounder
BEAUFORT, NC	1,028,999	17%	70
POINT JUDITH, RI	894,791	15%	129
PT. PLEASANT, NJ	558,815	9%	51
HAMPTON, VA	524,723	9%	55
NEWPORT NEWS, VA	498,680	8%	45
MONTAUK, NY	263,770	4%	68
CHINCOTEAGUE, VA	190,783	3%	25
BELFORD, NJ	180,625	3%	20
WANCHESE, NC	172,657	3%	15
CAPE MAY, NJ	161,144	3%	44
NEW BEDFORD, MA	142,044	2%	58
ENGELHARD, NC	139,805	2%	11
ORIENTAL, NC	104,421	2%	7
STONINGTON, CT	100,526	2%	19

Table 6: Number of dealers per state which reported purchases of summer flounder in 2018. C = Confidential.[4]

State	MA	RI	CT	NY	NJ	DE	MD	VA	NC
Number Of Dealers	30	27	15	49	29	C	6	16	28

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 ASMFC 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 ASMFC's management process and submitted to NMFS. The combined state or regional measures must achieve the same level of conservation as would a set of coastwide measures developed to adhere to the overall recreational harvest limit. If NMFS considers the combination of the state- or region- specific measures to be "equivalent" to the coastwide measures, they may then waive the coastwide regulation 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 conservation equivalency each year since 2001. From 2001 through 2013, measures were developed under state-by-state conservation equivalency. 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. The 2018 and 2019 regional conservation equivalency measures are given in Table 7.

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 previous estimates for shore and private boat modes, substantially raising the overall summer flounder catch and harvest estimates. On average, the new landings estimates for summer flounder (in pounds) are 1.8 times higher over the time series 1981-2017, and 2.3 times higher over the past 10 years (2008-2017). In 2017, new estimates of landings in pounds were 3.16 times higher than the previous estimates.

Revised MRIP estimates indicate that recreational catch 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 reached a low in 1989 with 5.06 million fish caught, while landings reached a low in 2018 with 2.41 million fish landed (3.35 million pounds; Figure 6).[5]

Table 7: Summer flounder recreational fishing measures in 2018 and 2019, by state, under regional conservation equivalency. 2018 and 2019 regions 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.

	2018			2019		
State	**Minimum Size (inches)**	**Possession Limit**	**Open Season**	**Minimum Size (inches)**	**Possession Limit**	**Open Season**
Massachusetts	17	5 fish	May 23-October 9	17	5 fish	May 23-October 9
Rhode Island (Private, For-Hire, and all other shore-based fishing sites)	19	6 fish	May 1-December 31	19	6 fish	May 3-December 31
RI 7 designated shore sites	N/A	N/A		19	4 fish*	
				17	2 fish*	
Connecticut	19	4 fish	May 4-September 30	19	4 fish	May 4- September 30
CT Shore Program (45 designed shore sites)	17			17		
New York	19			19		
New Jersey	18	3 fish	May 25-September 22	18	3 fish	May 24- September 21
NJ Shore program site (ISBSP)	16	2 fish		16	2 fish	
New Jersey/Delaware Bay COLREGS	17	3 fish		17	3 fish	
Delaware	16.5	4 fish	January 1-December 31	16.5	4 fish	January 1- December 31
Maryland						
PRFC						
Virginia						
North Carolina	15	4 fish	January 1-December 31	15	4 fish	January 1- December 31

*Combined possession limit of 6 fish, no more than 2 fish at 17-inch minimum size limit.

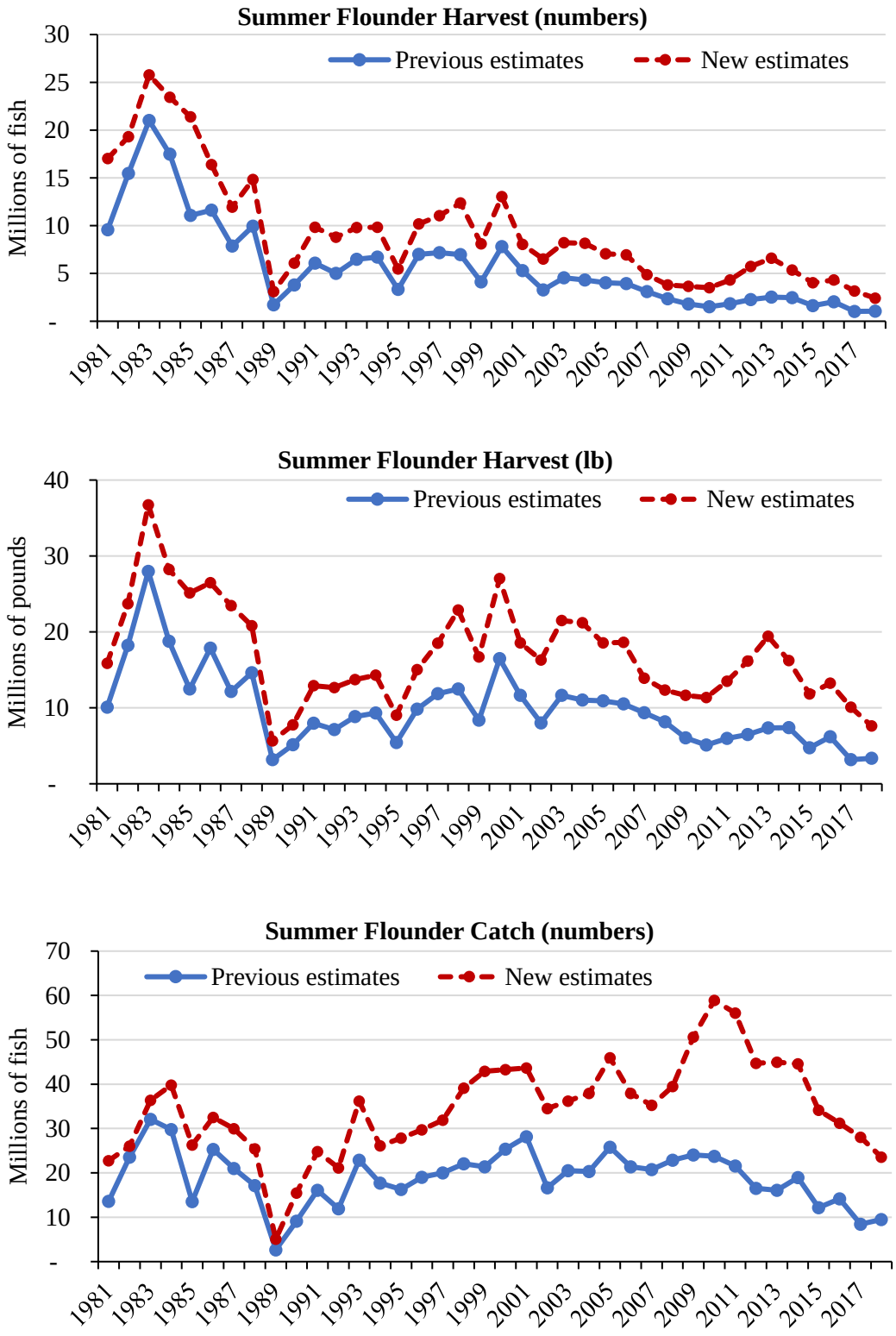

Figure 6: Pre- and post-revision MRIP estimates of recreational summer flounder harvest in numbers of fish and pounds and catch in numbers of fish, ME - NC, 1981 - 2017. 2018 "old" MRIP values are "back-calibrated," as MRIP stopped producing estimates using the old methodology after 2017.[5]

For-hire vessels carrying passengers in federal waters must obtain a federal party/charter permit. In 2018, 812 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 84 percent of the landings (in numbers of fish) occurred in state waters over the past ten years, and about 82 percent of landings came from state waters in 2018 (Table 8). The majority of summer flounder were landed in New York and New Jersey in 2018 (Table 9).[5]

By fishing mode, about 84% of recreational summer flounder harvest in 2018 was from anglers who fished on private or rental boats. About 6% was from party or charter boats, and about 10% was from anglers fishing from shore. The revised MRIP time series increased the proportion of harvest estimated to occur from private and shore modes while making no 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, 2009-2018 (revised MRIP data).[5]

Year	State <= 3 mi	EEZ > 3 mi
2009	90%	10%
2010	93%	7%
2011	94%	6%
2012	86%	14%
2013	77%	23%
2014	78%	22%
2015	82%	18%
2016	79%	21%
2017	79%	21%
2018	82%	18%
Avg. 2009 - 2018	**84%**	**16%**
Avg. 2016 - 2018	**80%**	**20%**

Table 9: State contribution (as a percentage) to total recreational landings of summer flounder (in numbers of fish), from Maine through North Carolina, 2016-2018 (revised MRIP data).[5]

State	2016	2017	2018	2016-2018 average
Maine	0%	0%	0%	0%
New Hampshire	0%	0%	0%	0%
Massachusetts	2%	2%	3%	2%
Rhode Island	3%	5%	7%	5%
Connecticut	8%	4%	7%	6%
New York	42%	37%	25%	35%
New Jersey	34%	38%	43%	38%
Delaware	4%	3%	4%	4%
Maryland	1%	2%	2%	2%
Virginia	5%	6%	6%	6%
North Carolina	2%	3%	2%	2%
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, 1981-2018 (revised MRIP data).[5]

Year	Shore	Party/Charter	Private/Rental	Total number of fish landed (millions)
1981	45%	7%	49%	17.02
1982	14%	12%	74%	19.29
1983	19%	12%	68%	25.78
1984	13%	12%	75%	23.45
1985	12%	5%	84%	21.39
1986	25%	6%	69%	16.38
1987	12%	7%	81%	11.93
1988	19%	11%	70%	14.82
1989	20%	7%	73%	3.10
1990	16%	13%	71%	6.07
1991	24%	10%	66%	9.83
1992	13%	6%	81%	8.79
1993	12%	9%	79%	9.80
1994	15%	9%	76%	9.82
1995	14%	4%	82%	5.47
1996	6%	7%	86%	10.18
1997	7%	7%	86%	11.04
1998	8%	3%	89%	12.37
1999	10%	5%	85%	8.10
2000	16%	5%	80%	13.05
2001	8%	3%	89%	8.03
2002	10%	4%	86%	6.51
2003	7%	6%	87%	8.21
2004	9%	9%	82%	8.16
2005	6%	6%	88%	7.04
2006	8%	3%	89%	6.95
2007	5%	9%	85%	4.85
2008	6%	4%	89%	3.78
2009	7%	4%	89%	3.65
2010	10%	4%	86%	3.51
2011	4%	3%	93%	4.33
2012	9%	3%	88%	5.74
2013	11%	4%	85%	6.59
2014	7%	7%	86%	5.28
2015	7%	5%	88%	3.95
2016	8%	4%	89%	4.30
2017	13%	4%	84%	3.17
2018	11%	5%	84%	2.41
% of Total, 1981-2018	14%	7%	78%	--
% of Total, 2014-2018	9%	6%	85%	--

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.

[2] Northeast Fisheries Science Center. 2019. Data Update for Summer Flounder.

[3] Northeast Fisheries Science Center (NEFSC). 2019. 66th Northeast Regional Stock Assessment Workshop (66th SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 19-01; 40 p. Available from: https://www.nefsc.noaa.gov/publications/crd/crd1908/.

[4] Unpublished NMFS dealer data as of June 3, 2019 (i.e., "AA tables", which include both state and federal dealer data).

[5] Personal communication from the National Marine Fisheries Service, Fisheries Statistics Division. Accessed June 27, 2019. Available at: http://www.st.nmfs.noaa.gov/recreational-fisheries/index.

[6] Unpublished NMFS permit data as of December 31, 2018.

[7] Unpublished NMFS Vessel Trip Report (VTR) data as of March 27, 2019.