Summer Flounder Fishery Information Document

June 2015

This document provides a brief overview of the biology, stock condition, management system, and fishery performance for summer flounder with an emphasis on 2014, the most recent complete fishing year.

1. Biology

Summer flounder (*Paralichthys dentatus*) 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]

Male and female growth rates vary substantially, with males growing more slowly. Males rarely live longer than 10 years, whereas females may live for up to 20 years and attain weights of about 25 lb.[2] In the 2013 benchmark stock assessment for summer flounder, the median length at maturity was estimated as 26.0 cm (10.2 inches) for male summer flounder, 29.2 cm (11.5 inches) for female summer flounder, and 26.8 cm (10.5 inches) for the sexes combined. The median age of maturity for summer flounder was determined to be 1.1 years for males, 1.4 years for females, and 1.2 years for both sexes combined.[3]

2. Status of the Stock

A statistical catch at age model (the age-structured assessment program, or "ASAP" model) was used in the 2013 peer-reviewed summer flounder benchmark stock assessment (57th Stock Assessment Workshop, or SAW 57).[3] The final report, as well as the Stock Assessment Review Committee (SARC) panelist reports, is available online at the Northeast Fisheries Science Center (NEFSC) website: http://www.nefsc.noaa.gov/saw/reports.html. Previous stock assessment reports, assessment updates, and peer review panelist reports are also available at this site.

The 2013 benchmark assessment indicated that the summer flounder stock was not overfished or subject to overfishing in 2012, relative to the new biological reference points derived from the SAW 57 assessment. The fishing mortality rate (F) was estimated to be 0.285 in 2012, below the

updated threshold fishing mortality reference point of F_{MSY} = 0.309 (Figure 1). Spawning Stock Biomass (SSB) was estimated to be 113.0 million lb (51,238 mt) in 2012, 18% below the updated SSB_{MSY} = 137.6 million lb (62,394 mt; Figure 2).[3]

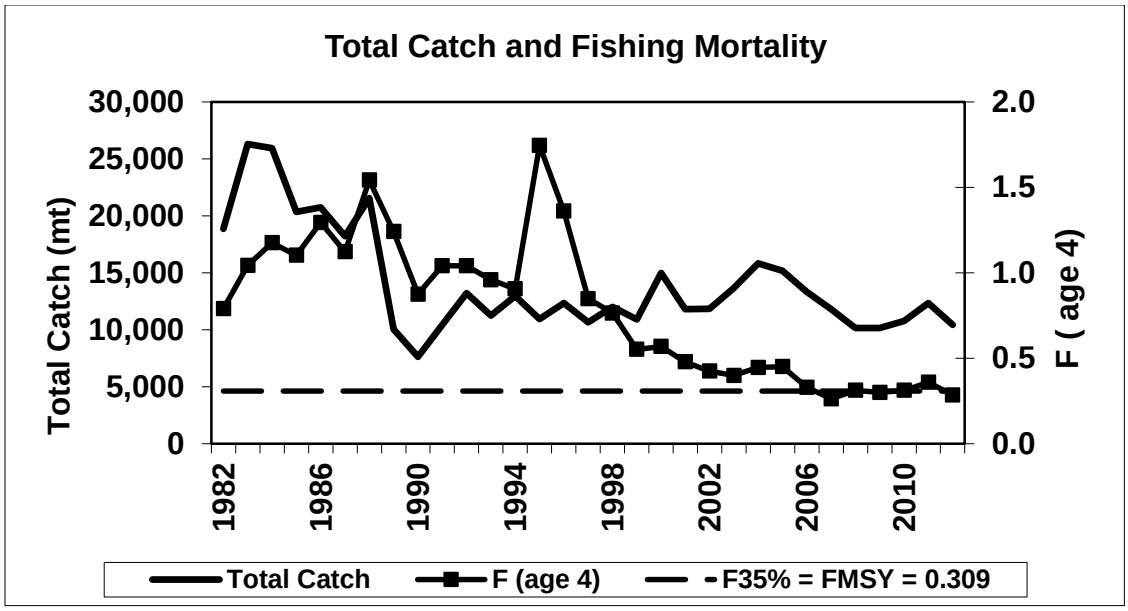

Figure 1: Total fishery catch and fishing mortality rate (F) for summer flounder. The horizontal dashed line is the 2013 SAW/SARC57 fishing mortality reference point. Overfishing occurs when the fishing mortality rate exceeds this threshold.[3]

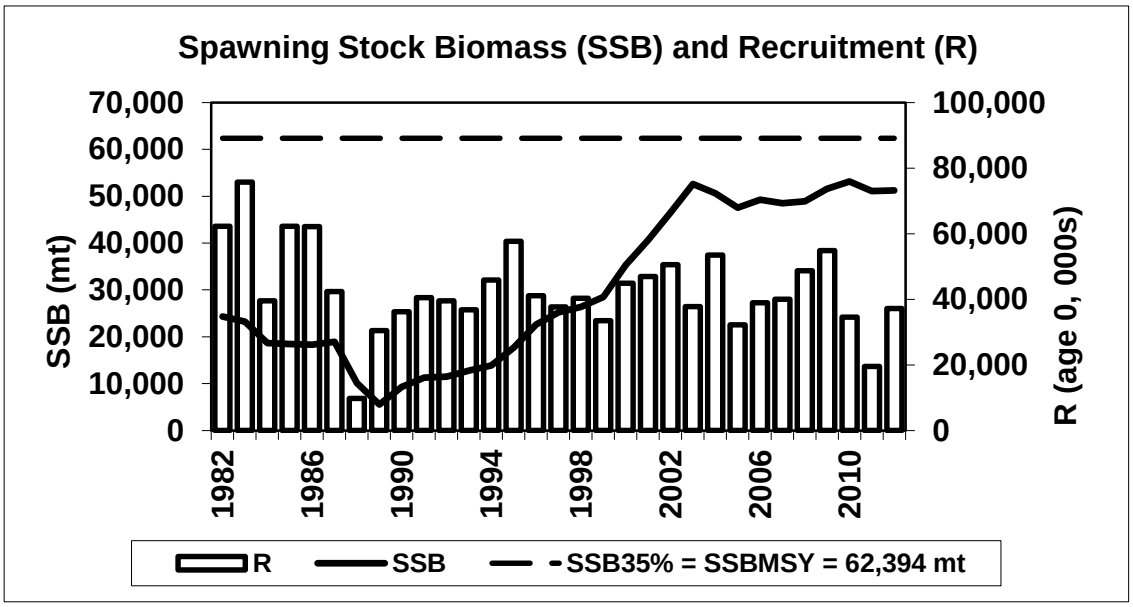

Figure 2: Summer flounder spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars) by calendar year. The horizontal dashed line is the 2013 SAW/SARC57 biomass target. The stock is considered overfished when biomass is below ½ of the biomass target (also known as the minimum stock size threshold).[3]

3. Management System and Overall Fishery Performance

The Mid-Atlantic Fishery Management Council (MAFMC or Council) and the Atlantic States Marine Fisheries Commission (ASMFC or 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 the National Marine Fisheries Service (NMFS), which serves as the federal implementation and enforcement entity. This cooperative management endeavor was developed because a significant portion of the catch is taken from both state (0-3 miles offshore) and federal waters (3-200 miles offshore, also known as the Exclusive Economic Zone, or EEZ).

The 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.

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. Summer flounder was under a stock rebuilding strategy beginning in 2000 until it was declared rebuilt in 2011. 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. 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 ABCs and ACLs include both projected landings and discards. Projected discards are subtracted to determine the commercial quota and recreational harvest limit, which are landings-based limits. Summer flounder catch and landings limits for the past ten years are shown in Table 1.

Total (commercial and recreational) summer flounder landings declined in the early 1980's, dropping to a low of 14.4 million lb in 1990, and in 2014 were about 18.3 million lb total (Figure 3).[4,5]

Table 1: Summary of catch limits, landings limits, and landings for commercial and recreational summer flounder fisheries from 2005 through 2015.

Management measures	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
ABC[a] (m lb)	--	--	--	--	21.50	25.5	33.95	25.58	22.34	21.94	22.57
Commercial ACL[b]	--	--	--	--	--	--	--	14.00	12.11	12.87	13.34
Commercial quota (millions of lb)[c]	17.90	13.94	9.79	9.32	10.74	12.79	17.38	12.73	11.44	10.51	11.07
Commercial landings (millions of lb)	16.91	13.92	10.02	9.21	11.05	13.55	16.57	12.91	12.49	10.91	--
% of commercial quota landed	94%	100%	102%	99%	103%	106%	95%	101%	109%	104%	--
Recreational ACL	--	--	--	--	--	--	--	11.58	10.23	9.07	9.44
Recreational harvest limit (m lb)[c]	11.98	9.29	6.68	6.21	7.16	8.59	11.58	8.49	7.63	7.01	7.38
Recreational landings (m lb)	10.92	10.51	9.34	8.15	6.03	5.11	5.96	6.49	7.12	7.39	--
% of recreational harvest limit landed	91%	113%	140%	131%	84%	59%	51%	76%	93%	105%	--

[a] The ABC is the Acceptable Biological Catch recommended by the Council's Scientific and Statistical Committee (SSC). The ABC is equivalent to the sum of the commercial and recreational Annual Catch Limits ACLs), and includes both landings and discards.

[b] The ACLs are annual sector-specific catch limits for the commercial and recreational fisheries. The ACLs include both landings and discards.

[c] For 2005-2014, commercial quotas and recreational harvest limits are adjusted for both Research Set Aside (RSA) and projected discards. Quotas and harvest limits for 2015 do not reflect an adjustment for RSA, as the program was suspended for 2015.

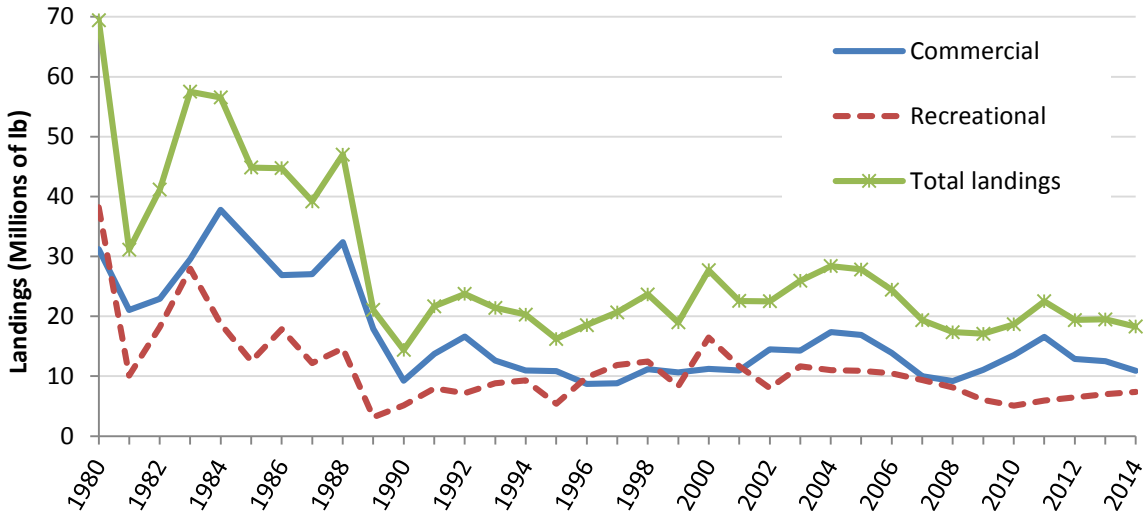

Figure 3: Commercial and recreational summer flounder landings in millions of pounds, Maine-North Carolina, 1980-2014.[4,5]

4. Commercial Summer Flounder Measures and Fishery Performance

Commercial landings of summer flounder peaked in 1984 at 37.77 million pounds, and reached a low of 8.80 million pounds in 1997 (Figure 3). In 2014, commercial fishermen landed approximately 10.91 million pounds of summer flounder (corresponding to 104% of the commercial quota).[4]

In federal waters, a moratorium permit is required to fish commercially for summer flounder. Permit data for 2014 indicate that 828 vessels held commercial permits for summer flounder.[6]

The commercial quota is divided among the states based on the allocation percentages given in Table 2, and each state sets measures to achieve their state-specific commercial quotas.

Table 2: 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

Vessel Trip Report (VTR) data for 2014 indicate that the bulk of the summer flounder landings were taken by bottom otter trawls (96 percent), with other gear types (e.g. scallop trawls, sink gill nets, hand lines, scallop dredges, and beam trawls) each accounting for 1 percent or less 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 in the winter and 100 lb in the summer).

VTR data were also used to identify all National Marine Fisheries Service statistical areas that accounted for more than 5 percent of the summer flounder catch in 2014 (Table 3; Figure 4). Statistical area 537 was responsible for the highest percentage of the catch, with statistical area 613 having the majority of trips that caught summer flounder (Table 3).[7]

Table 3: Statistical areas that accounted for at least 5 percent of the total summer flounder catch in 2014, with associated number of trips.[7]

Statistical Area	Percent of 2014 Commercial Summer Flounder Catch	Number of Trips
537	24%	1,689
616	23%	565
622	11%	218
613	8%	1,697
612	7%	1,608

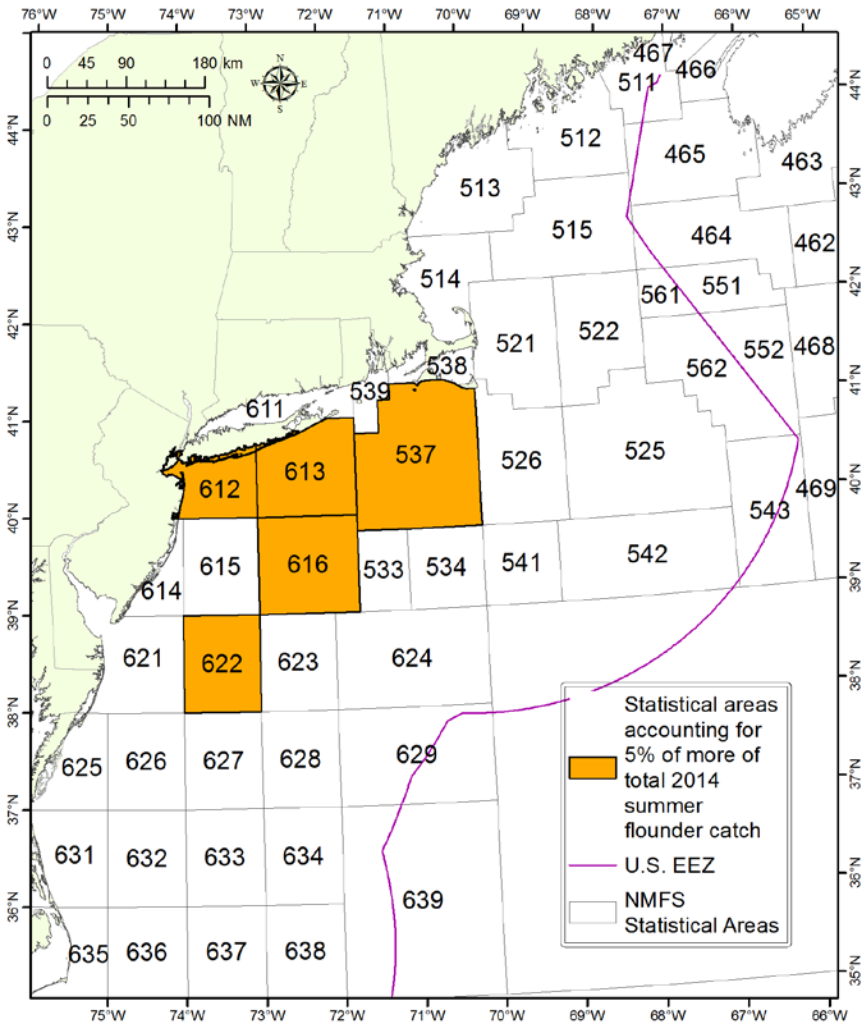

Figure 4: NMFS Statistical Areas, highlighting those that each accounted for more than 5% of the commercial summer flounder catch in 2014.[7]

For the years 1994 through 2014, NMFS dealer data indicate that summer flounder total ex-vessel revenue has ranged from a low of $23.0 million in 1996 to a high of $36.3 million in 2005 (adjusted to real 2014 dollars to account for inflation). The mean price per pound for summer flounder has ranged from a low of $1.84 in 2011 to a high of $2.94 in 1995 (adjusted to 2014 dollars; Figure 5). In 2014, 10.91 million pounds of summer flounder were landed generating $30.0 million in total ex-vessel revenue (an average of $2.75 per pound).[4]

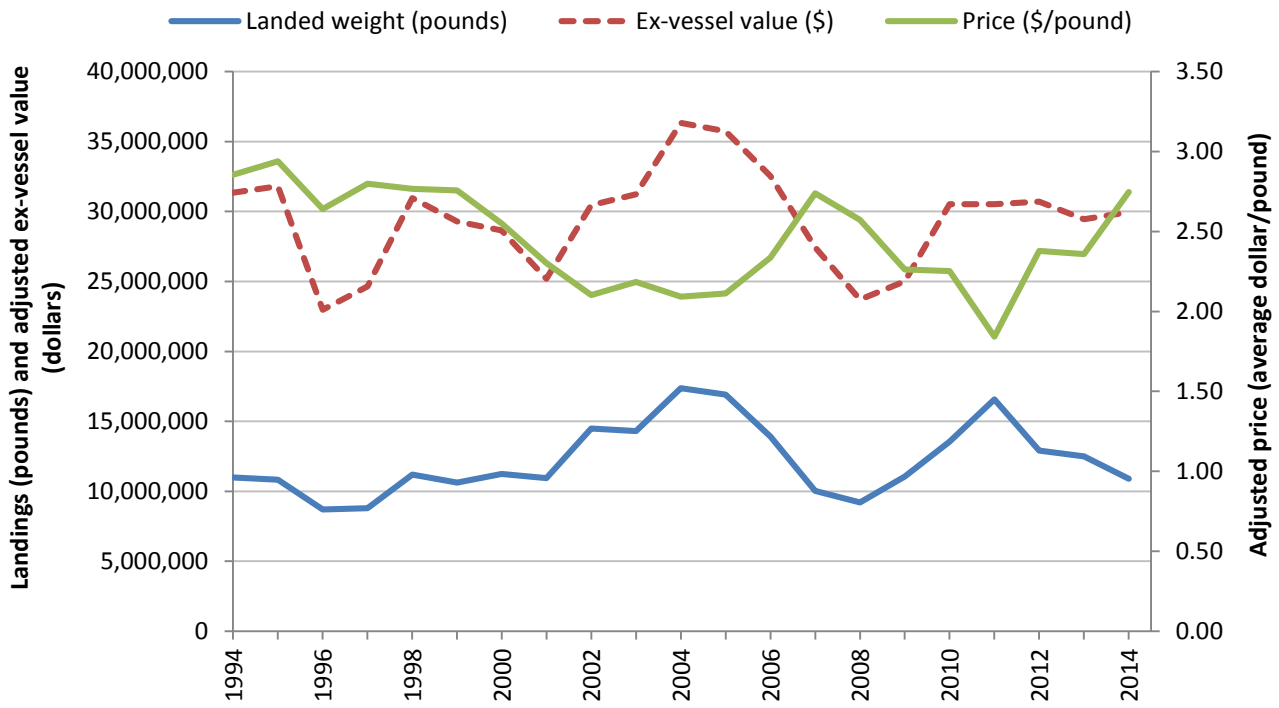

Figure 5: Landings, ex-vessel value, and price per pound for summer flounder, Maine through North Carolina, 1994-2014. Ex-vessel value and price are adjusted to real 2014 dollars.[4]

At least 100,000 lb of summer flounder were landed by commercial fishermen at each of 20 ports in eight states in 2014. These 20 ports accounted for approximately 93% of all 2014 commercial summer flounder landings. Point Judith, RI was the leading port in 2014, both in terms of pounds of summer flounder landed and number of vessels landing summer flounder (Table 4).[4] The ports and communities that are dependent on summer flounder are fully described in Amendment 13 to the FMP (available at http://www.mafmc.org/sf-s-bsb/). Detailed community profiles developed by the Northeast Fisheries Science Center's Social Science Branch can be found at www.mafmc.org/communities/.

Table 4: Ports reporting at least 100,000 lb of summer flounder in 2014, and the corresponding percentage of total 2014 commercial summer flounder landings.[4]

Port	Summer Flounder Landings (lb)	% of total commercial summer flounder landings	Number of vessels
POINT JUDITH, RI	1,824,045	17%	129
WANCHESE, NC	848,648	8%	28
HAMPTON, VA	843,060	8%	40
PT. PLEASANT, NJ	821,659	8%	46
BEAUFORT, NC	806,150	7%	29
NEWPORT NEWS, VA	744,103	7%	37
CHINCOTEAGUE, VA	567,127	5%	36
ENGELHARD, NC	508,370	5%	12
MONTAUK, NY	492,440	5%	77
CAPE MAY, NJ	483,879	4%	56
BELFORD, NJ	323,379	3%	17
NEW BEDFORD, MA	292,116	3%	59
ORIENTAL, NC	273,929	3%	7
HOBUCKEN, NC	272,200	2%	10
STONINGTON, CT	169,898	2%	20
OCEAN CITY, MD	164,380	2%	19
LONG BEACH/BARNEGAT LIGHT, NJ	146,970	1%	24
HAMPTON BAYS, NY	128,076	1%	26
HYANNIS, MA	104,711	1%	12
OTHER CURRITUCK, NC	102,118	1%	7

Over 214 federally permitted dealers from Maine through North Carolina bought summer flounder in 2014. More dealers bought summer flounder in New York than in any other state (Table 5). All dealers bought approximately $30.0 million worth of summer flounder in 2014.[4]

Table 5: Dealers reporting buying summer flounder, by state in 2014. Note: C = Confidential.[4]

State	MA	RI	CT	NY	NJ	DE	MD	VA	NC
Number Of Dealers	29	33	19	55	34	C	3	14	27

5. Recreational Summer Flounder Measures and Fishery Performance

There is a significant recreational fishery for summer flounder in state waters, which occurs seasonally 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 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. In 2014 and 2015, a regional approach was used, under which the states within each region must have identical size limits, possession limits, and season length. 2015 regional conservation equivalency measures are given in Table 6.

Table 6: Summer flounder recreational fishing measures in 2015, by state, under regional conservation equivalency. 2015 regions include: 1) Massachusetts, 2) Rhode Island, 3) Connecticut, New York, and New Jersey, 4) Delaware, Maryland, The Potomac River Fisheries Commission, and Virginia, and 5) North Carolina.

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	16	5 fish	May 22-September 23
Rhode Island	18	8 fish	May 1-December 31
Connecticut	18	5 fish	May 17-September 21
CT Shore Program (46 designated shore sites)	16		
New York	18	5 fish	May 17-September 21
New Jersey	18	5 fish	May 22-September 26
NJ Shore Program (1 site)	16	2 fish	May 22-September 26
Delaware	16	4 fish	All year
Maryland	16	4 fish	All year
Potomac River Fish. Commission (PRFC)	16	4 fish	All year
Virginia	16	4 fish	All year
North Carolina	15	6 fish	All year

Recreational data for years 2004 and later are available from the Marine Recreational Information Program (MRIP). For years prior to 2004, recreational data were generated by the Marine Recreational Fishery Statistics Survey (MRFSS). Recreational catch and landings for summer flounder peaked in 1983 with 32.11 million fish caught and 21.00 million fish landed. Catch reached a low in 1989 with 2.69 million fish caught, while landings reached a low in 2010 with 1.50 million fish landed (Table 7).[5]

For-hire vessels carrying passengers in federal waters must obtain a federal party/charter permit. In 2014, there were 788 party and charter vessels that held summer flounder federal for-hire permits.[6] Many of these vessels also hold recreational permits for scup and black sea bass.

Table 7: Recreational summer flounder landings data from the NMFS recreational statistics databases, 1981-2014.[5]

Year	Catch (thousands of fish)	Landings (thousands of fish)	Landings (thousands lb)
1981	13,603	9,567	10,081
1982	23,591	15,473	18,233
1983	32,110	20,996	27,969
1984	29,900	17,475	18,765
1985	13,526	11,066	12,490
1986	25,308	11,621	17,861
1987	21,082	7,865	12,167
1988	17,223	9,960	14,624
1989	2,694	1,717	3,158
1990	9,114	3,794	5,134
1991	16,211	6,068	7,960
1992	11,918	5,002	7,148
1993	22,919	6,494	8,831
1994	17,741	6,703	9,328
1995	16,309	3,326	5,421
1996	19,044	6,997	9,820
1997	20,053	7,167	11,866
1998	22,114	6,979	12,477
1999	21,398	4,107	8,366
2000	25,414	7,801	16,468
2001	28,203	5,294	11,637
2002	16,698	3,262	8,008
2003	20,555	4,559	11,638
2004	20,450	4,316	11,022
2005	25,974	4,027	10,915
2006	21,546	3,950	10,505
2007	20,737	3,108	9,337
2008	22,910	2,350	8,151
2009	24,127	1,806	6,030
2010	23,737	1,501	5,108
2011	21,569	1,840	5,956
2012	16,534	2,272	6,490
2013	15,558	2,419	7,014
2014	19,448	2,456	7,394

On average, an estimated 88 percent of the landings (in numbers of fish) have occurred in state waters over the past ten years, and about 76 percent of landings came from state waters in 2014 (Table 8). Landings by state indicate that the majority of summer flounder were landed in New York and New Jersey in 2014 (Table 9).[5]

Table 8: Estimated percentage of summer flounder recreational landings in state vs. federal waters, Maine through North Carolina, 2005-2014.[5]

Year	State <= 3 mi	EEZ > 3 mi
2005	81.5%	18.5%
2006	90.2%	9.8%
2007	88.9%	11.1%
2008	96.5%	3.5%
2009	90.9%	9.1%
2010	92.4%	7.6%
2011	95.3%	4.7%
2012	87.8%	12.2%
2013	76.5%	23.5%
2014	76.4%	23.6%
Avg. 2005 - 2014	**87.6%**	**12.4%**
Avg. 2012 - 2014	**80.2%**	**19.8%**

Table 9: State contribution (as a percentage) to total recreational landings of summer flounder (in numbers of fish), from Maine through North Carolina, 2013 and 2014.[5]

State	2013	2014
Maine	0.0%	0.0%
New Hampshire	0.0%	0.0%
Massachusetts	1.2%	4.7%
Rhode Island	4.9%	7.5%
Connecticut	11.1%	4.9%
New York	18.3%	21.3%
New Jersey	50.5%	47.5%
Delaware	2.2%	3.6%
Maryland	2.1%	2.9%
Virginia	7.8%	5.7%
North Carolina	1.9%	1.9%
Total	**100%**	**100%**

Landings by recreational fishing mode indicate that anglers fishing from private or rental boats are responsible for the majority of summer flounder landings in number of fish (Table 10).[5]

Table 10: The number (in thousands of fish) of summer flounder landed by recreational fishing mode, Maine through North Carolina, 1981-2014.[5]

Year	Shore (thousands of fish)	Party/Charter (thousands of fish)	Private/Rental (thousands of fish)
1981	3,146	1,362	5,059
1982	1,121	5,936	8,416
1983	3,964	3,574	13,458
1984	1,356	2,496	13,624
1985	786	1,152	9,128
1986	1,237	1,609	8,775
1987	406	1,150	6,309
1988	946	1,134	7,879
1989	180	141	1,395
1990	262	413	3,118
1991	565	598	4,905
1992	275	375	4,351
1993	342	1,013	5,138
1994	447	836	5,419
1995	242	267	2,816
1996	207	660	6,130
1997	255	931	5,981
1998	316	361	6,302
1999	213	301	3,593
2000	570	649	6,583
2001	227	330	4,737
2002	155	262	2,846
2003	204	389	3,966
2004	200	464	3,652
2005	104	499	3,425
2006	154	316	3,480
2007	98	499	2,510
2008	79	172	2,099
2009	63	177	1,566
2010	60	160	1,282
2011	35	138	1,667
2012	106	169	1,996
2013	133	169	2,118
2014	79	412	1,931
% of Total, 1981-2014	9%	14%	78%
% of Total, 2010-2014	4%	10%	86%

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] Bolz, G.R., J.P. Monaghan Jr., K.L. Land, R.W.Gregory, and J.M. Burnett, Proceedings of the summer flounder aging workshop, 1-2 February 1999, Woods Hole, Massachusetts. NOAA Tech. Mem. NMFS-NE-156, 15 p.

[3] Northeast Fisheries Science Center. 2013. 57th Northeast Regional Stock Assessment Workshop (57th SAW) Assessment Summary Report. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 13-14; 39 p. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026, or online at: http://nefsc.noaa.gov/publications/.

[4] Unpublished NMFS dealer data.

[5] Marine Recreational Information Program. 2015. Recreational catch estimates for summer flounder, 1981-2014. NMFS Office of Science and Technology. Available at: http://www.st.nmfs.noaa.gov/recreational-fisheries/index.

[6] Unpublished NMFS permit data.

[7] Unpublished NMFS Vessel Trip Report (VTR) data.