



## Summer Flounder Advisory Panel Information Document<sup>1</sup>

August 2013

### Management System

The Fishery Management Plan (FMP) for summer flounder became effective in 1988, and established the management unit for summer flounder (*Paralichthys dentatus*) as the 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 the summer flounder resource. There are two management entities that work cooperatively to develop fishery regulations for this species: the Atlantic States Marine Fisheries Commission (ASMFC) and the Mid-Atlantic Fishery Management Council (MAFMC), in conjunction with the National Marine Fisheries Service (NMFS) 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).

The commercial and recreational fisheries are managed using catch and landings limits, commercial quotas, recreational harvest limits, 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>.

### Basic Biology

Detailed information on summer flounder life history and habitat requirements can be found in the document titled "Essential Fish Habitat Source Document: Summer Flounder, *Paralichthys dentatus*, Life History and Habitat Characteristics" (Packer et al. 1999), available at: <http://www.nefsc.noaa.gov/nefsc/habitat/efh/>. Information contained in that document is summarized below.

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.

---

<sup>1</sup> Data employed in the preparation of this document are from unpublished National Marine Fisheries Service (NMFS) Dealer, Vessel Trip Reports (VTRs), Permit, and Marine Recreational Statistics (MRFSS/MRIP) databases, as of July 2013, unless otherwise noted.

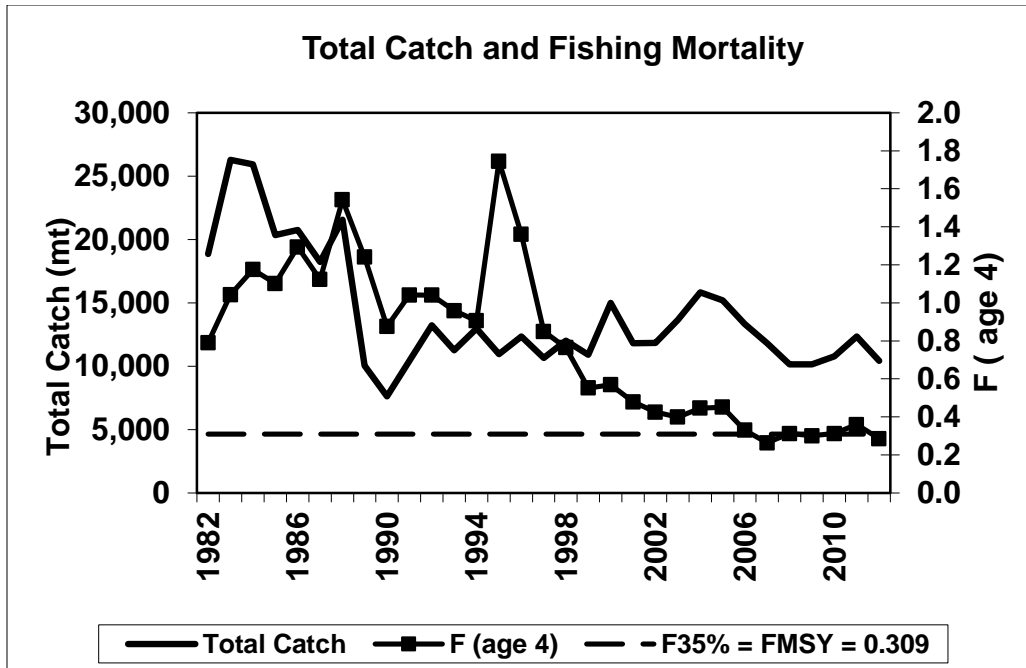
Summer flounder habitat includes pelagic waters, demersal waters, saltmarsh creeks, seagrass beds, mudflats, and open bay areas from the Gulf of Maine through North Carolina. They are opportunistic feeders, and their prey includes a variety of fish and crustaceans. While the natural predators of adult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

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 (Bolz et al. 1999) and attain weights of about 25 lbs. Based on an analysis of NEFSC Fall Survey maturity data from 1992-1997, the median length at maturity (50<sup>th</sup> percentile,  $L_{50}$ ) was estimated as 27.0 cm (10.6 inches) for male summer flounder, 30.3 cm (11.9 inches) for female summer flounder, and 27.6 cm (10.9 inches) for the sexes combined (NEFSC 2008). The median age of maturity (50<sup>th</sup> percentile,  $A_{50}$ ) 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 (NEFSC 2008).

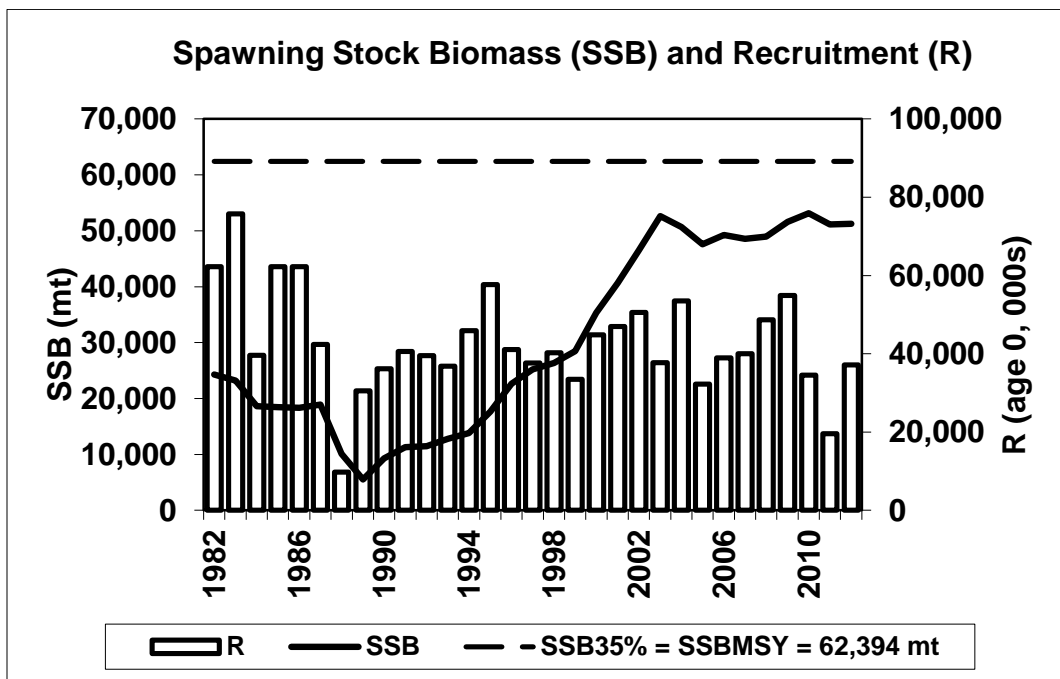
### **Status of the Stock**

An age-structured assessment program (ASAP) was used in the 2013 peer-reviewed summer flounder stock benchmark stock assessment (57<sup>th</sup> Stock Assessment Workshop; NEFSC 2013). As of August 2013, the Stock Assessment Workshop (SAW) Report is undergoing the final steps of the peer review and publication processes. The finalized report, along with the Stock Assessment Review Committee (SARC) panelist reports, will be available in September 2013, online at the NEFSC website: <http://www.nefsc.noaa.gov/saw/>. Previous stock assessment reports, assessment updates, and peer review panelist reports are also available at the site above.

Preliminary results of the 2013 benchmark assessment indicate 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. Fishing mortality ( $F$ ) 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). The summer flounder stock was previously under a rebuilding plan, but was declared rebuilt in 2010 based on the 2011 assessment update.



**Figure 1:** Total fishery catch and fully-recruited fishing mortality (F, peak at age 4) of summer flounder. The horizontal dashed line is the 2013 SAW/SARC57 fishing mortality reference point proxy. Source: NEFSC 2013.



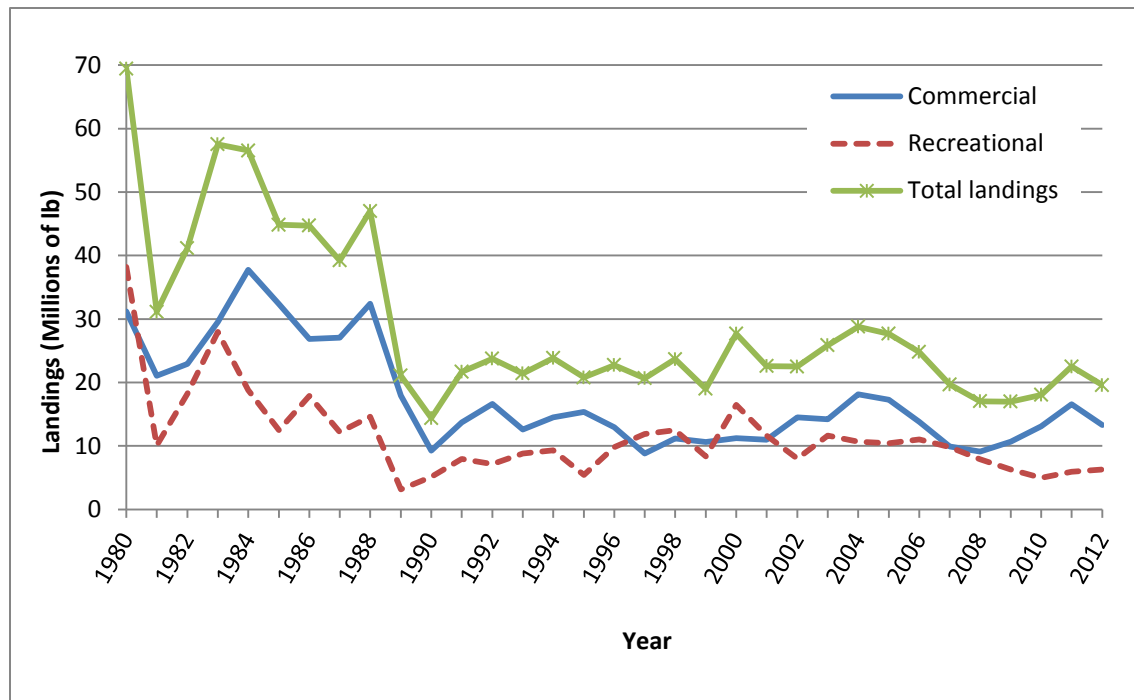
**Figure 2:** Summer flounder spawning stock biomass (SSB; solid line) and recruitment at age 0 (R; vertical bars) by calendar year. The horizontal dashed line is the 2013 SAW/SARC57 biomass reference point proxy. Source: NEFSC 2013.

## Fishery Performance

There are significant commercial and recreational fisheries for summer flounder. The summer flounder stock is 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.

### *Commercial Fishery*

In Federal waters, commercial fishermen holding a moratorium permit may fish for summer flounder. Permit data for 2012 indicates that 870 vessels held commercial permits for summer flounder. Total (commercial and recreational) landings declined in the early 1980's to a low of 14.4 million lb in 1990, and in 2012 were about 20 million lb total (Figure 3).



**Figure 3:** Commercial and Recreational U.S. Summer Flounder Landings (Pounds) from Maine-North Carolina, 1980-2012.

Table 1 summarizes the summer flounder management measures for the 2003-2014 fishing years. Acceptable biological catch (ABC) levels have been identified for this stock since 2009, and recreational and commercial annual catch limits (ACLs), with a system of overage accountability for each ACL, were first implemented in 2012. It should be noted that catch limits include both projected landings and discards, whereas the commercial quotas and recreational harvest limits are landings based (i.e., harvest). 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 1:** Summary of summer flounder management measures and landings for 2003 through 2014.

Management measures	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014 <sup>d</sup>
ABC (m lb)	NA	NA	NA	NA	NA	NA	21.50	25.5	33.95	25.58	22.34	22.24
TAC (m lb)	NA	NA	NA	NA	NA	NA	20.90	25.5	33.95	25.58	22.34	22.24
Commercial ACL	NA	NA	NA	NA	NA	NA	NA	NA	NA	14.00	12.11	12.05
Com. quota-adjusted (m lb) <sup>c</sup>	13.87	16.76	17.90	13.94	9.79	9.32	10.74	12.79	17.38	12.73	11.44	11.39
Com. landings	14.22	18.14	17.25	13.81	9.90	9.13	10.69	13.07	16.57	13.31	NA	NA
Recreational ACL	NA	NA	NA	NA	NA	NA	NA	NA	NA	11.58	10.23	10.19
Rec. harvest limit-adjusted (m lb) <sup>c</sup>	9.28	11.21	11.98	9.29	6.68	6.21	7.16	8.59	11.58	8.49	7.59	NA
Rec. landings	11.64	10.65	10.42	11.00	9.80	7.90	6.30	4.97	5.96	6.29	NA	NA
Com. fish size (in)	14	14	14	14	14	14	14	14	14	14	14	14
Com. Min. mesh size (in, diamond)	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>	5.5 <sup>a</sup>
Recreational measures	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	CE <sup>b</sup>	NA

<sup>a</sup>Whole Net. <sup>b</sup>State-specific conservation equivalency (CE) measures. <sup>c</sup>Adjusted for Research Set-Aside and projected discards. NA=Not applicable or not yet available. <sup>d</sup>These reflect the regulations currently set for summer flounder in 2014, however, the Council and ASFMC will review new stock assessment information in October 2013 and may revise as necessary.

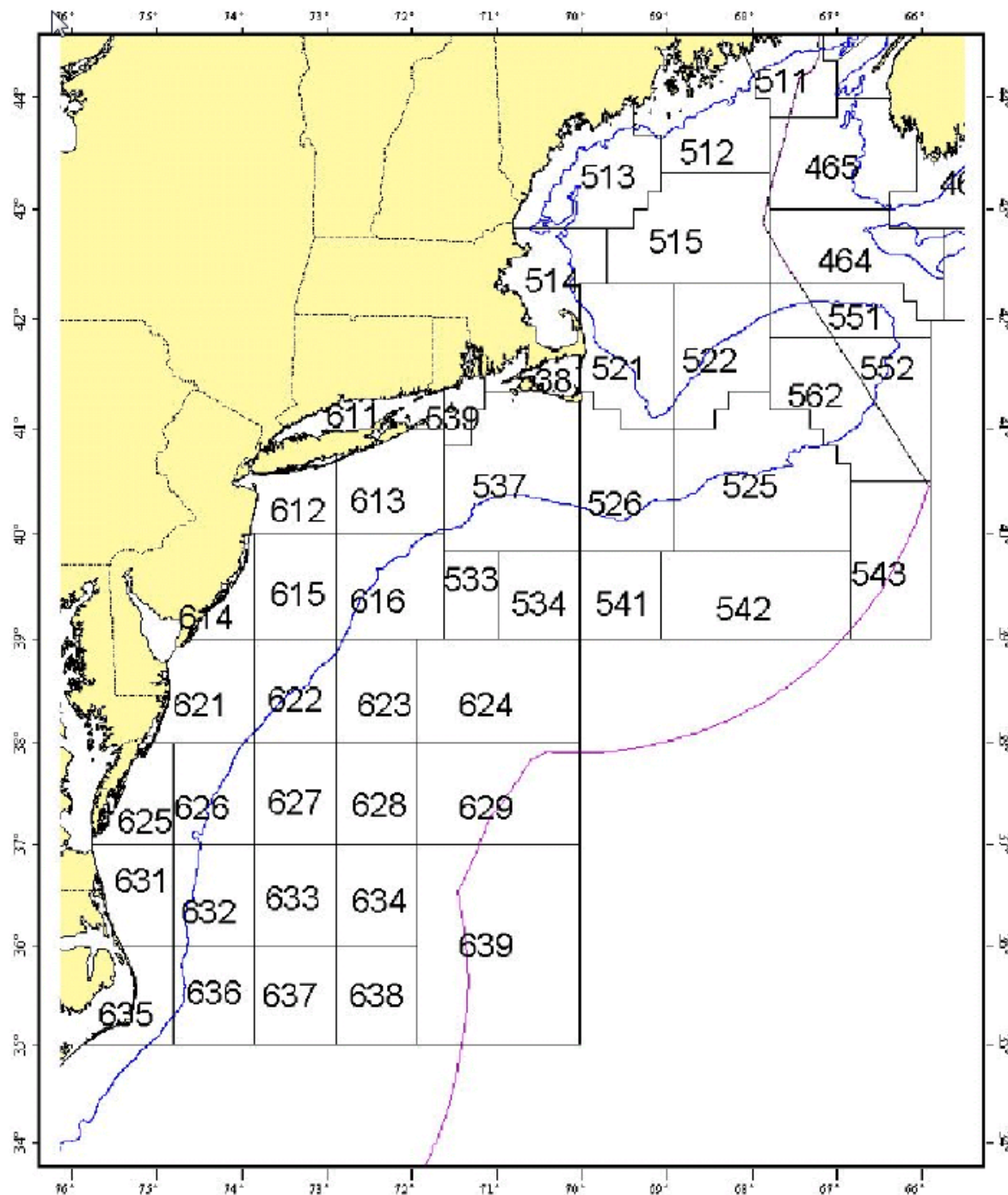
**Table 2:** State-by-state percent share of commercial summer flounder allocation.

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

NMFS statistical areas are shown in Figure 4. VTR data suggest that statistical area 616, which includes Hudson Canyon, was responsible for the highest percentage of the catch, with statistical area 612 having the majority of trips that caught summer flounder (Table 3).

**Table 3:** Statistical areas that accounted for at least 5 percent of the summer flounder catch in 2012 and associated number of trips, NMFS VTR data.

Statistical Area	Summer Flounder Catch (percent)	Summer Flounder Trips (N)
616	18.55	511
537	18.15	1578
613	11.36	1956
612	9.79	2550
626	6.85	170
622	6.32	199

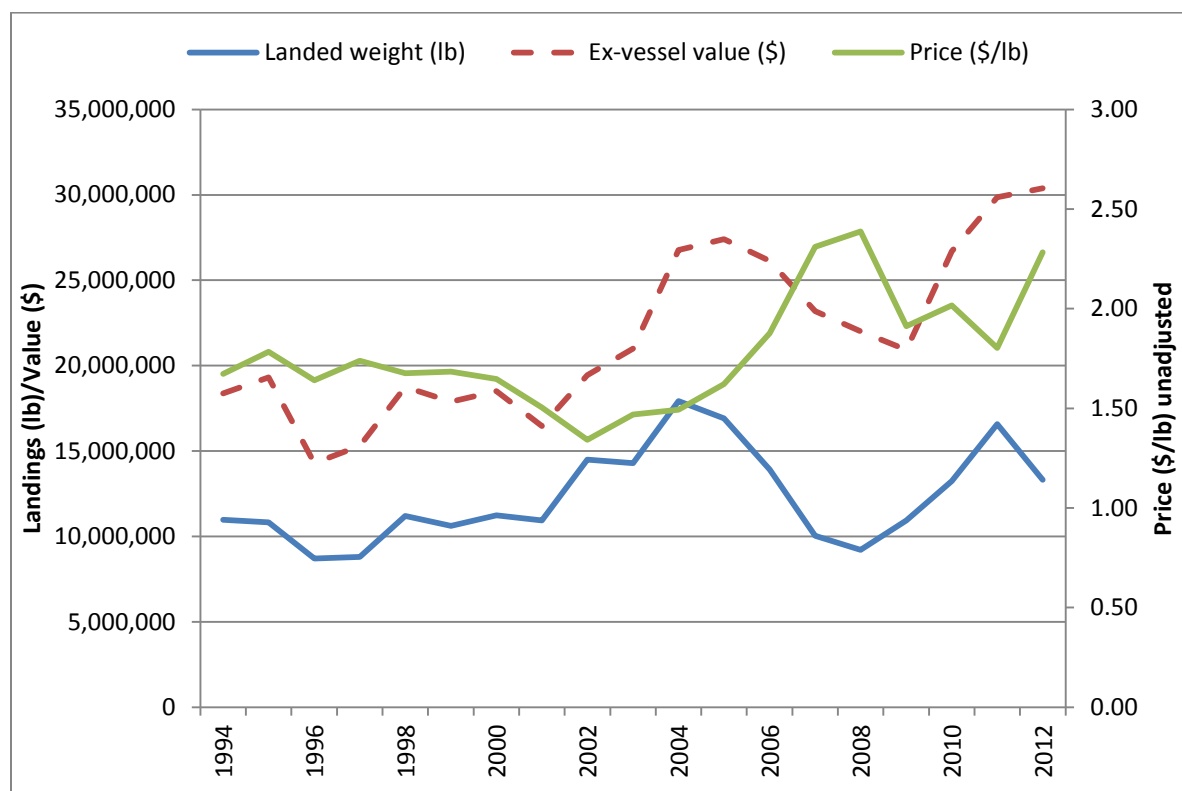


**Figure 4:** National Marine Fisheries Service Statistical Areas.

Based on VTR data for 2012, the bulk of the summer flounder landings were taken by bottom otter trawls (over 97 percent), with other gear types (e.g. hand lines, scallop dredges, sink gill nets) each accounting for less than 1 percent of landings. Current regulations require a 14 inch total length minimum fish size in the commercial fishery and a 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.

Summer flounder ex-vessel revenues based on dealer data have ranged from \$14.3 to \$30.4 million for the 1994 through 2012 period. The mean price for summer flounder (unadjusted) has ranged from a low of \$1.34/lb in 2002 to a high of \$2.39/lb in 2008 (Figure 5). In 2012, 13.3 million pounds of summer flounder were landed generating \$30.4 million in revenues (\$2.28/lb).



**Figure 5:** Landings, ex-vessel value, and price (unadjusted) for summer flounder, Maine through North Carolina, 1994-2012.

The ports and communities that are dependent on summer flounder are fully described in Amendment 13 to the FMP. Additional information can be found in the document titled "Community Profiles for the Northeast US Fisheries":

<http://www.nefsc.noaa.gov/read/socialsci/pdf/communityProfiles/introduction.pdf>.

To examine recent landings patterns among ports, 2012 NMFS dealer data are used. The top commercial landings ports for summer flounder by pounds landed are shown in Table 4. A "top port" is defined as any port that landed at least 100,000 lb of summer flounder. Related data for the recreational fisheries are shown in subsequent sections. However, due to the nature of the recreational database, it is inappropriate to desegregate to less than state levels.



**Table 4:** Top ports of landing (in lb) for summer flounder (FLK), based on NMFS 2012 dealer data. Since this table includes only the “top ports,” it may not include all of the landings for the year.

Port	Landings of FLK (lb)	# FLK Vessels
PT. JUDITH, RI	2,096,432	116
NEWPORT NEWS, VA	2,070,498	43
HAMPTON, VA	1,558,804	40
PT. PLEASANT, NJ	1,083,671	45
CHINCOTEAGUE, VA	900,431	38
CAPE MAY, NJ	579,144	53
MONTAUK, NY	573,699	75
BELFORD, NJ	480,688	22
STONINGTON, CT	445,142	20
NEW BEDFORD, MA	429,116	80
BEAUFORT, NC	362,190	11
WANCHESE, NC	283,975	16
ENGELHARD, NC	204,792	9
HAMPTON BAY, NY	160,051	32
MATTITUCK, NY	150,942	4
OCEAN CITY, MD	139,841	25
WOODS HOLE, MA	138,629	27
HOBUCKEN, NC	116,417	48
NANTUCKET, MA	107,560	12

Among the states from Maine through North Carolina, New York had the highest number of Federally permitted dealers (53) who bought summer flounder in 2012 (Table 5). All dealers bought approximately \$30.4 million worth of summer flounder in 2012.

**Table 5:** Dealers reporting buying summer flounder, by state in 2012. Note: C = Confidential.

Number of Dealers	MA	RI	CT	NY	NJ	DE	MD	VA	NC
	36	40	10	53	31	C	4	17	21

### ***Recreational Fishery***

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. To manage this fishery, state-specific conservation equivalency was developed and has been used every year since 2001 (Table 1). Under conservation equivalency, state-specific measures are developed through the ASMFC, and are submitted to NMFS. If NMFS considers the combination of the state-specific measures to be "equivalent" to the coastwide measures, they may then waive the coastwide regulation in Federal waters. Those fishermen fishing in Federal waters are then subject to the measures of the state in which they land summer flounder. The 2013 recreational fishing measures are given in Table 6.

**Table 6:** Summer flounder recreational fishing measures in 2013, by state, under conservation equivalency.

State	Minimum Size (inches)	Possession Limit	Open Season
Massachusetts	16	5 fish	May 22-September 30
Rhode Island	18	8 fish	May 1-December 31
Connecticut*	17.5	5 fish	May 15-October 31
*At 46 designated shore sites	16		
New York	19	4 fish	May 1-September 29
New Jersey	17.5	5 fish	May 18-September 16
Delaware	17	4 fish	All year
Maryland	16	4 fish	March 28-December 31
Potomac River Fish. Commission	16	4 fish	All year
Virginia	16	4 fish	All year
North Carolina	15	6 fish	All year

Recreational data have been available through the Marine Recreational Information Program (MRIP) since 2004, and prior to 2004 were available through the Marine Recreational Fishery Statistics Survey (MRFSS). Recreational catch and landings for summer flounder peaked in 1983 and were at the lowest levels in 1989 (Table 7).

**Table 7:** Recreational summer flounder landings data from the NMFS recreational statistics databases, 1981-2012.

<b>Year</b>	<b>Catch ('000 of fish)</b>	<b>Landings ('000 of fish)</b>	<b>Landings ('000 lb)</b>
1981	13,579	9,567	10,081
1982	23,562	15,473	18,233
1983	32,062	20,996	27,969
1984	29,785	17,475	18,765
1985	13,526	11,066	12,490
1986	25,292	11,621	17,861
1987	21,023	7,865	12,167
1988	17,171	9,960	14,624
1989	2,677	1,717	3,158
1990	9,101	3,794	5,134
1991	16,075	6,068	7,960
1992	11,910	5,002	7,148
1993	22,904	6,494	8,831
1994	17,725	6,703	9,328
1995	16,308	3,326	5,421
1996	18,994	6,997	9,820
1997	20,027	7,167	11,866
1998	22,086	6,979	12,477
1999	21,378	4,107	8,366
2000	25,384	7,801	16,468
2001	28,187	5,294	11,637
2002	16,674	3,262	8,008
2003	20,532	4,559	11,638
2004	20,336	4,316	10,966
2005	25,806	4,027	10,867
2006	21,400	3,950	10,589
2007	20,732	3,108	9,256
2008	22,897	2,350	8,134
2009	24,085	1,806	5,987
2010	23,722	1,501	5,108
2011	21,559	1,840	5,954
2012	16,180	2,199	6,289

When anglers are intercepted through the surveys conducted for the recreational statistics programs, they are asked about where the majority of their fish were caught (i.e., inland, state

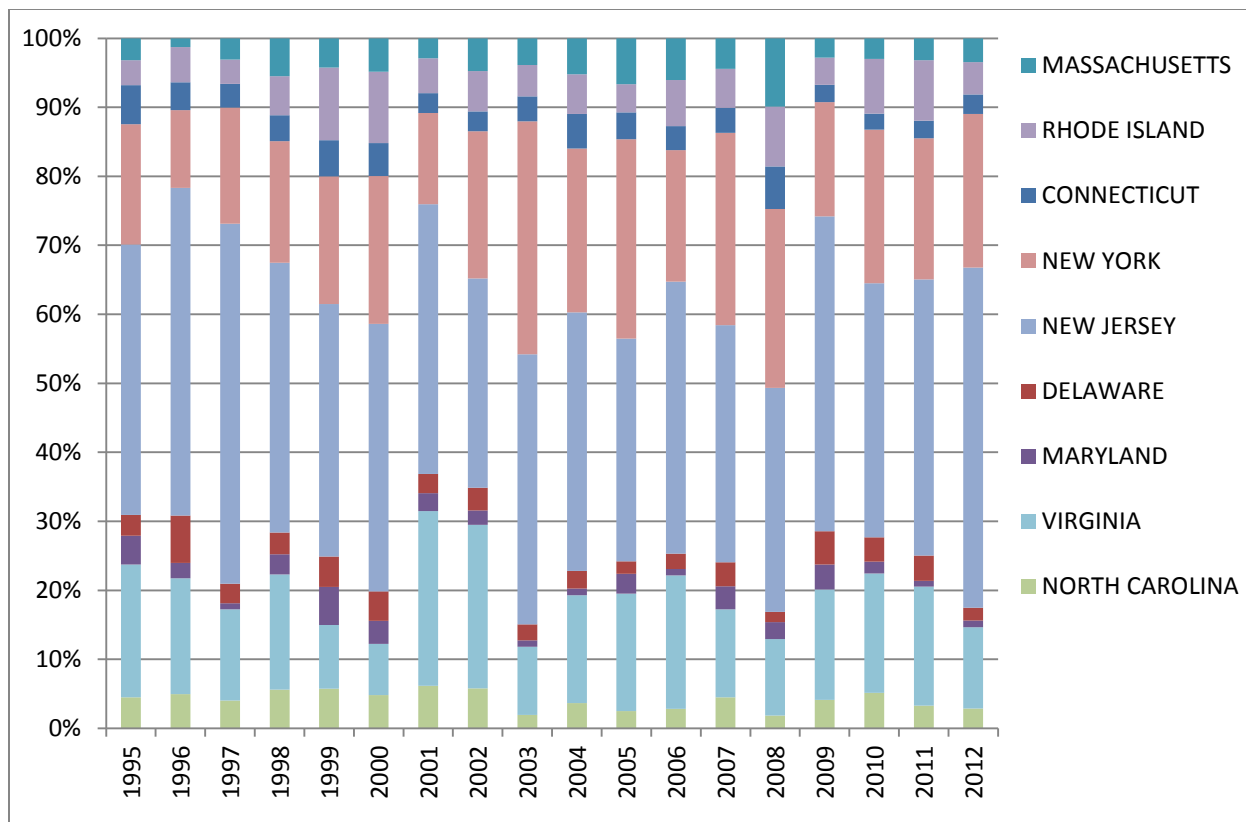
waters ( $\leq 3$  miles), exclusive economic zone (EEZ;  $> 3$  miles)). While these data are somewhat imprecise, they do provide a general indication of where the majority of summer flounder are landed recreationally, and indicate that about 90 percent of the landings (in numbers of fish) occur in state waters (Table 8).

**Table 8:** Percentage of summer flounder recreational landings (MRIP Type A+B1 in number of fish) by area (state vs. Federal waters), Maine through North Carolina, 2003-2012. Area information is self-reported based on where the majority of fishing activity occurred per angler trip.

Year	State $\leq 3$ mi	EEZ $> 3$ mi
2003	91.7	8.3
2004	87.7	12.3
2005	81.2	18.8
2006	90.4	9.6
2007	88.9	11.1
2008	96.8	3.2
2009	90.8	9.2
2010	92.3	7.7
2011	95.4	4.6
2012	88.0	12.0
<b>Avg. 2003 - 2012</b>	90.3	9.7
<b>Avg. 2010 - 2012</b>	91.2	8.1

**Table 9:** State contribution (as a percentage) to total recreational landings of summer flounder, (MRIP Type A+B1 in number of fish), from Maine through North Carolina, 2011 and 2012.

State	2011	2012
Maine	0.0	0.0
New Hampshire	0.0	0.0
Massachusetts	3.2	3.4
Rhode Island	8.8	4.7
Connecticut	2.6	2.8
New York	20.4	22.3
New Jersey	40.0	49.3
Delaware	3.6	1.9
Maryland	0.8	1.0
Virginia	17.3	11.8
North Carolina	3.3	2.9
<b>Total</b>	<b>100%</b>	<b>100%</b>



**Figure 6:** State contribution (as a percentage) of total recreational landings of summer flounder (MRIP Type A + B1 in number of fish), from Massachusetts through North Carolina, 1995-2012.

The states of New Jersey and New York land the majority of fish, followed by Virginia (Table 9; Figure 6). Since the mid-1990s, the state contributions of landings (in numbers of fish) have fluctuated from year to year but remained relatively consistent (Figure 6).

In 2012, there were 826 recreational vessels (i.e., party and charter vessels) that held summer flounder Federal recreational permits. Many of these vessels also hold recreational permits for scup and black sea bass. Landings by mode indicate that private/rental fishermen are responsible for the majority of summer flounder landings (Table 10).

**Table 10:** The number of summer flounder landed from Maine through North Carolina by mode, 1981-2012.

<b>Year</b>	<b>Shore</b>	<b>Party/Charter</b>	<b>Private/Rental</b>
1981	3,145,683	1,362,252	5,058,639
1982	1,120,521	5,936,006	8,416,173
1983	3,963,680	3,574,229	13,458,398
1984	1,355,595	2,495,733	13,623,843
1985	786,185	1,152,247	9,127,759
1986	1,237,033	1,608,907	8,774,921
1987	406,095	1,150,095	6,308,572
1988	945,864	1,134,353	7,879,442
1989	180,268	141,320	1,395,177
1990	261,898	413,240	3,118,447
1991	565,404	597,610	4,904,637
1992	275,474	375,245	4,351,387
1993	342,225	1,013,464	5,138,352
1994	447,184	836,362	5,419,145
1995	241,906	267,348	2,816,460
1996	206,927	659,876	6,130,182
1997	255,066	930,633	5,981,121
1998	316,314	360,777	6,302,004
1999	213,447	300,807	3,592,741
2000	569,612	648,755	6,582,707
2001	226,996	329,705	4,736,910
2002	154,958	261,554	2,845,647
2003	203,717	389,142	3,965,811
2004	200,368	463,776	3,652,354
2005	104,295	498,614	3,424,557
2006	154,414	315,935	3,479,934
2007	98,418	499,160	2,510,000
2008	79,339	171,951	2,098,583
2009	62,691	176,997	1,566,490
2010	59,812	160,109	1,281,546
2011	34,849	137,787	1,667,240
2012	106,342	96,386	1,996,407
<b>% of Total, 1981-2012</b>	9%	14%	77%
<b>% of Total, 2008-2012</b>	3%	8%	89%

The NMFS angler expenditure survey summarizes a variety of costs associated with recreational fishing in the Northeast (Table 11). In addition, Steinback et al., 2009 summarized the reasons for fishing, with a majority of anglers (about 85 percent) fishing either mostly or fully for recreational purposes (Table 12).

**Table 11:** Average daily trip expenditures (\$ unadjusted) by recreational fishermen in the Northeast region by mode, in 2006. Source: Gentner and Steinback (2008)

Expenditures	\$		
	Party/Charter	Private/Rental	Shore
Private transportation	13.88	11.03	12.94
Public transportation	0.26	0.07	0.40
Auto rental	0.27	0.02	0.10
Food from grocery stores	7.40	4.92	7.33
Food from restaurants	8.70	3.42	9.28
Lodging	10.0	2.64	14.90
Boat fuel	0	9.54	0
Boat or equipment rental	0.05	0.19	0.03
Charter fees	57.76	0	0
Charter crew tips	3.0	0	0
Catch processing	0.02	0	0
Access and parking	0.44	1.11	1.32
Bait	0.31	3.42	3.25
Ice	0.39	0.59	0.39
Tackle used on trip	1.87	2.04	3.98
Tournament fees	1.10	0.04	0.02
Gifts and souvenirs	1.67	0.10	1.45
Total	107.13	39.14	55.39

**Table 12:** Purpose of Marine Recreational Fishing in the Northeast. Source: Steinback et al., 2009.

	Percent	Number of anglers in 2005 (thousands)
All for food or income	2.1	92.4
Mostly for food or income	<1.0	34.3
Both for recreation and for food or income	11.7	514.8
Mostly for recreation	13.2	580.8
All for recreation	72.2	3,176.8

## References

- 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.
- Gentner, B. and S.Steinback. 2008. The economic contribution of marine angler expenditures in the United States, 2006. U.S. Dep. Commerce, NOAA Tech. Memo. NMFS-F/SPO-94, 301p.
- Northeast Fisheries Science Center. 2008. 47<sup>th</sup> Northeast Regional Stock Assessment Workshop (47<sup>th</sup> SAW) Assessment Report. US Dept Commer Northeast Fish Sci Cent Ref Doc 08-12a; 335 p. Available at: <http://www.nefsc.noaa.gov/publications/crd/crd0812>.
- Northeast Fisheries Science Center. 2013. 57th Northeast Regional Stock Assessment Workshop (57th SAW) Assessment Report. Pre-publication draft.
- 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
- Steinback, S., K. Wallmo, P. Clay. 2009. Saltwater sport fishing for food or income in the Northeastern US: statistical estimates and policy implications. *Marine Policy* 33: 49-57.