



Black Sea Bass Advisory Panel Information Document¹

June 2014

Management System

The Fishery Management Plan (FMP) for black sea bass became effective in 1997 when it was incorporated into the Summer Flounder and Scup FMP. The FMP established the management unit for black sea bass (*Centropristis striata*) as the U.S. waters in the western Atlantic Ocean from Cape Hatteras, North Carolina to the U.S.-Canadian border. The FMP additionally included measures to ensure effective management of the black sea bass resource. Two management entities work cooperatively to develop fishery regulations for black sea bass: the Atlantic States Marine Fisheries Commission (ASMFC), and the Mid-Atlantic Fishery Management Council (MAFMC). The National Marine Fisheries Service (NMFS) works in conjunction with the MAFMC as the federal implementation and enforcement entity. This cooperative management endeavor was developed because significant portions of black sea bass catch are taken from both state (0-3 miles offshore) and Federal waters (3-200 miles offshore).

The commercial and recreational black sea bass 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. Black sea bass was under a stock rebuilding strategy beginning in 2000 until it was declared rebuilt in 2009. The FMP, including subsequent Amendments and Frameworks, is available on the Council website at: <http://www.mafmc.org/fisheries/fmp/sf-s-bsb>.

Basic Biology

Detailed information on black sea bass life history and habitat requirements can be found in the documents titled "Essential Fish Habitat Source Document: Black Sea Bass, *Centropristis striata*, Life History and Habitat Characteristics" (Steimle et al. 1999) as well as in an update of that document, "Essential Fish Habitat Source Document: Black Sea Bass, *Centropristis striata*, Life History and Habitat Characteristics (2nd Edition)" (Drohan et al. 2007). Electronic versions are available at the following website: <http://www.nefsc.noaa.gov/nefsc/habitat/efh/>. Information contained in these documents is summarized here.

The northern population of black sea bass spawns in the Middle Atlantic Bight over the continental shelf during the spring through fall, primarily between Virginia and Cape Cod, Massachusetts. Spawning begins in the spring in the southern portion of the population range, i.e., off North Carolina and Virginia, and progresses north into southern New England waters in the summer and fall. Collections of ripe fish and egg distributions indicate that the species

¹ 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 May 2014, unless otherwise noted.

spawns primarily on the inner continental shelf between Chesapeake Bay and Montauk Pt., Long Island. The duration of the larval stage and habitat-related settlement cues are unknown; therefore, distribution and habitat use of this pelagic stage may only partially overlap with that of the egg stage. Adult black sea bass are also very structure oriented, especially during their summer coastal residency. Unlike juveniles, they tend to enter only larger estuaries and are most abundant along the coast. Larger fish tend to be found in deeper water than smaller fish. A variety of coastal structures are known to be attractive to black sea bass, including shipwrecks, rocky and artificial reefs, mussel beds and any other object or source of shelter on the bottom. In the warmer months, inshore, resident adult black sea bass are usually found associated with structured habitats. During the summer, adult black sea bass share complex coastal habitats with other fishes including tautog, hakes, conger eel, sea robins and other transient species. Essential Fish Habitat for black sea bass consists of pelagic waters, structured habitat (e.g., sponge beds), rough bottom shellfish, and sand and shell, from the Gulf of Maine through Cape Hatteras, North Carolina.

Black sea bass attain a maximum size of around 60 cm (23.6 in) and 4 kg (8.8 lb), with a maximum age for females of 8 and age 12 for males (DPSWG 2009). Maturity data is routinely collected on Northeast Fisheries Science Center (NEFSC) survey cruises and model estimates for length suggest 50 percent maturity occurs at 20.4 cm (8.0 inches) with 95 percent maturity attained by 28 cm (11.0 inches).

Adult black sea bass are generalist carnivores that feed on a variety of infaunal and epibenthic invertebrates, especially crustaceans (including juvenile lobster, crabs, and shrimp), small fish, and squid. The NEFSC food habits database lists the spiny dogfish, Atlantic angel shark, skates, spotted hake, summer flounder, windowpane, and goosefish as predators of black sea bass.

Status of the Stock

The most recent accepted benchmark assessment on black sea bass, which used a statistical catch at length (SCALE) model, was peer-reviewed and accepted in December 2008 by the Data Poor Stock Working Group (DPSWG) Peer Review Panel (DPSWG 2009). Reports on “Stock Status,” including annual assessment and reference point update reports, Stock Assessment Workshop (SAW) reports, Stock Assessment Review Committee (SARC) panelist reports, and DPSWG reports and peer-review panelist reports are available online at the NEFSC website: <http://www.nefsc.noaa.gov/saw/>.

The latest assessment update was completed in July 2012, and concluded that the stock was not overfished and overfishing was not occurring in 2011, relative to the DPSWG biological reference points. The 2011 stock was at 102% of the spawning stock biomass at maximum sustainable yield (SSB_{MSY}). Fishing mortality (F_{MULT}) in 2011 was $F = 0.21$, a decrease from $F=0.41$ in 2010 (Figure 1). This point estimate of F in 2011 is below the fishing mortality threshold of $F=0.44$. Estimates for 2011 total biomass were at 28.0 million lb (12,700 mt), above the value for B_{MSY} . Spawning stock biomass (SSB) in 2011 was estimated at 24.6 million lb (11,145 mt). 2011 SSB was 102% of SSB_{MSY} (24.0 million lb, 10,880 mt; Figure 2). Recruitment estimated by the model was relatively constant through the time series with the exception of the 1999 and 2001 year classes. These cohorts appeared to be the driving force behind the increase in biomass and SSB. The estimated average recruitment (age one) in 2011 (2010 cohort) was 21.0 million fish.

The DPSWG Panel noted that despite acceptance of the assessment model there was “*considerable uncertainty with respect to stock status.*” The review Panel also recommended that the SSC “*recognize and allow for the sizeable uncertainty in stock status when establishing catch limits.*”

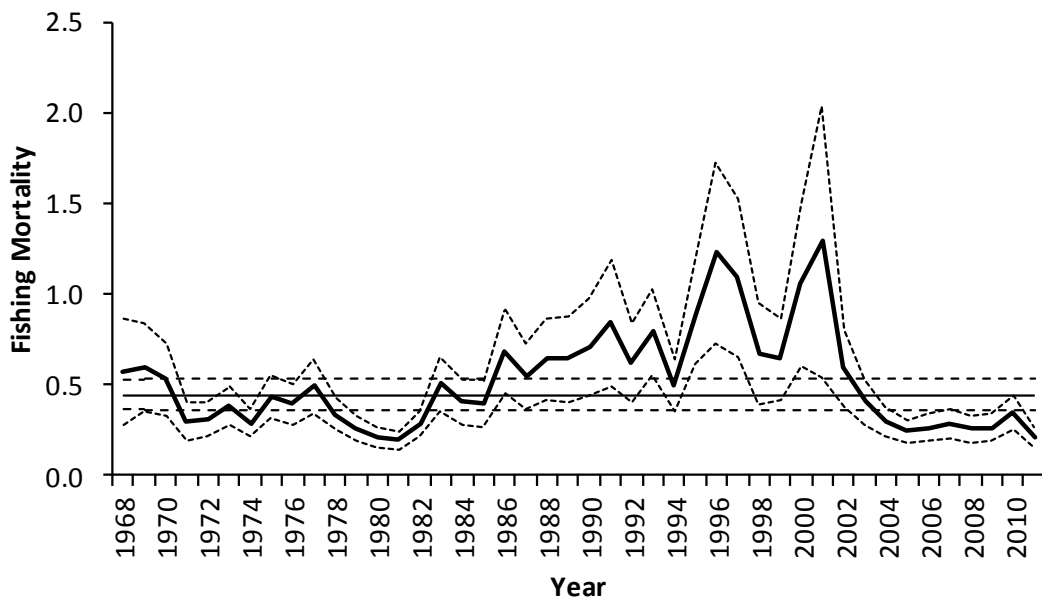


Figure 1: Estimated fishing mortality (+/- 2 standard deviations) of black sea bass from 1968-2011. Horizontal lines are $F_{MSY} \pm 80\%$ confidence interval. Source: Shepherd 2012.

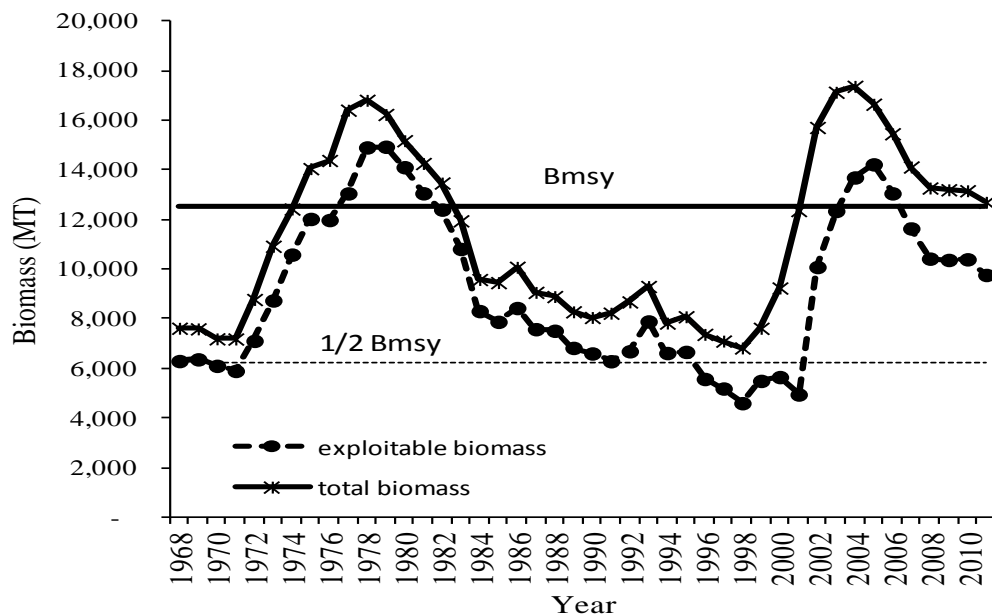


Figure 2: Estimated black sea bass total and exploitable biomass (mt) from SCALE model update, 1968-2011. Also shown are the biological reference points associated with total biomass. Source: Shepherd 2012.

Fishery Performance

There are significant commercial and recreational fisheries for black sea bass. Black sea bass is managed primarily using output controls (catch and landings limits), with 49 percent of the landings being allocated to the commercial fishery as a commercial quota and 51 percent allocated to the recreational fishery as a recreational harvest limit.

Table 1 summarizes the black sea bass management measures for the 2004-2015 fishing years. Acceptable biological catch (ABC) levels have been identified for this stock since 2010, 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).

Total landings (commercial and recreational) peaked in the late 1980's at 15.8 million lb, and in 2013 were about 4.7 million lb total (Figure 3).

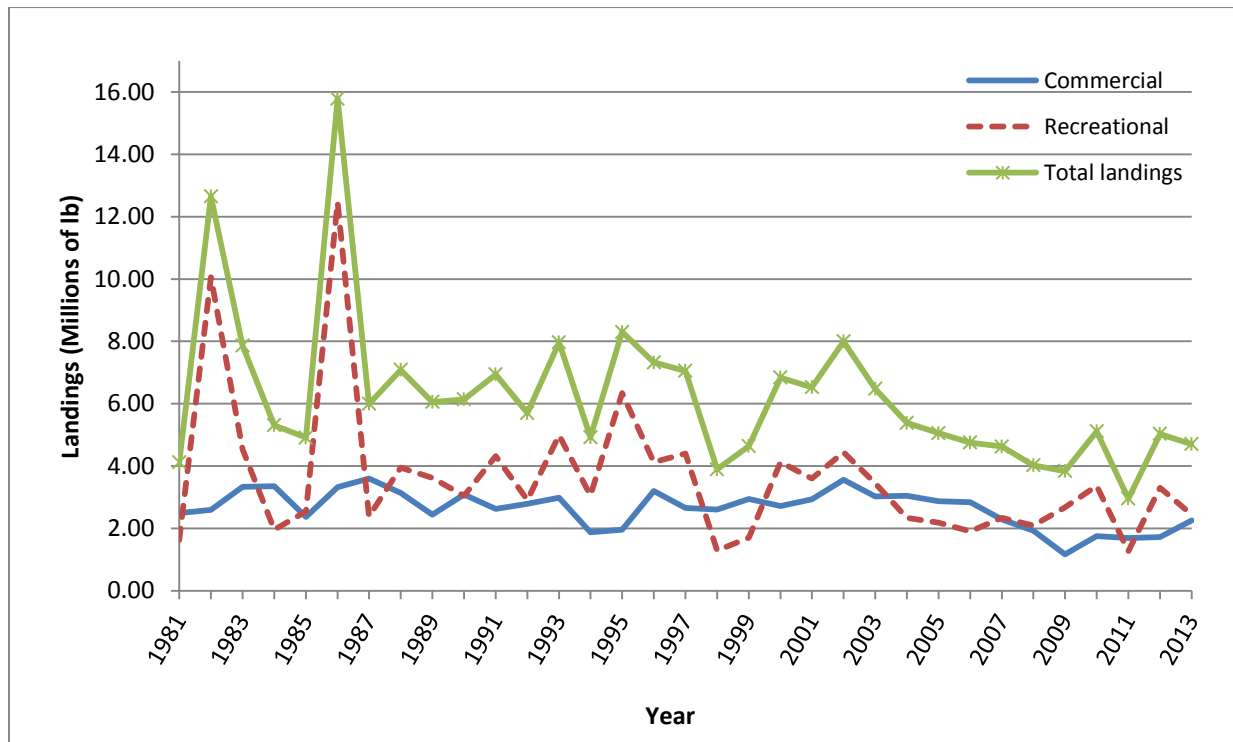


Figure 3: Commercial and Recreational U.S. Black Sea Bass Landings (Pounds) from Maine-North Carolina, 1981-2013.

Table 1: Summary of management measures and landings for 2004 through 2015.

Management measures	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015 ^a
ABC (m lb)	NA	NA	NA	NA	NA	NA	4.500	4.500	4.500	5.50	5.50	5.50
TAC (m lb)	NA	NA	NA	NA	NA	2.300	4.500	4.500	4.500	5.50	5.50	5.50
Commercial ACL (m lb)	NA	NA	NA	NA	NA	NA	NA	NA	1.980	2.60	2.60	2.60
Com. quota-adjusted (m lb) ^b	3.77	3.95	3.83	2.38	2.03	1.09	1.76	1.71	1.71	2.17	2.17	2.17
Commercial landings (m lb)	3.04	2.87	2.84	2.29	1.93	1.17	1.75	1.69	1.72	2.26	NA	NA
Recreational ACL (m lb)	NA	NA	NA	NA	NA	NA	NA	NA	1.860	2.90	2.90	2.90
Rec. harvest limit-adjusted (m lb) ^b	4.01	4.13	3.99	2.47	2.11	1.14	1.83	1.78	1.32	2.26	2.26	2.26
Recreational landings (m lb) ^c	2.34	2.18	1.91	2.34	2.09	2.67	3.36	1.27	3.31	2.44	NA	NA
Com. fish size (in)	11	11	11	11	11	11	11	11	11	11	11	11
Com. min. mesh size (in, diamond)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Threshold (lb)	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100	500/100
Vent size (in)	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8	1 3/8
Recreational measures (minimum fish size (total length), possession limit, and open season)	12-in TL, 25 fish, 1/1-9/7 and 9/22-11/30	12-in TL, 25 fish, 1/1-12/31	12-in TL, 25 fish, 1/1-12/31	12-in TL, 25 fish, 1/1-12/31	12-in TL, 25 fish, 1/1-12/31	12.5-in TL, 25 fish, 1/1-10/5	12.5-in TL, 25 fish, 5/22-10/11 and 11/1-12/31	12.5-in TL, 25 fish, 5/22-10/11 and 11/1-12/31	12.5-in TL, 25 fish, 5/19-10/14 and 11/1-12/31	12.5-in TL, 20 fish, 5/19-10/14 and 11/1-12/31	12.5-in TL, 15 fish, 5/19-9/18 and 10/18-12/31	NA

^aThese reflect the regulations currently set for black sea bass in 2015, however, the Council and ASFMC will review these catch limits and management measures in August 2014 and may revise as necessary. ^bAdjusted for RSA and projected discards. ^cIncludes landings from all of North Carolina. NA=Not applicable or not yet available.

Commercial Fishery

In Federal waters, commercial fishermen holding a moratorium permit may fish for black sea bass. Permit data for 2013 indicate that 736 vessels held commercial permits for black sea bass. The ASMFC divides the black sea bass commercial quota among the states based on the allocation percentages given in Table 2, and states set measures to achieve their state-specific commercial quotas.

Table 2: The ASFMC black sea bass allocation formula for the commercial fisheries in each state.

State	Allocation (percent)
ME	0.5
NH	0.5
MA	13.0
RI	11.0
CT	1.0
NY	7.0
NJ	20.0
DE	5.0
MD	11.0
VA	20.0
NC	11.0
Totals	100

National Marine Fisheries Service statistical areas are shown in Figure 4, with areas that accounted for more than 5 percent of the black sea bass catch in 2013 highlighted. Vessel trip report (VTR) data suggest that statistical areas 615, 616 (includes Hudson canyon), and 621 were responsible for the largest percentage of the catch. Statistical area 537 had the majority of trips that caught black sea bass (Table 3).

Table 3: Statistical areas that accounted for at least 5 percent of the commercial black sea bass catch in 2013, with associated number of trips. Source: NMFS VTR data.

Statistical Area	Black Sea Bass Catch (percent)	Black Sea Bass Trips (N)
615	16.18	173
616	14.78	351
621	13.69	261
537	7.07	741
622	6.26	103
631	5.13	69

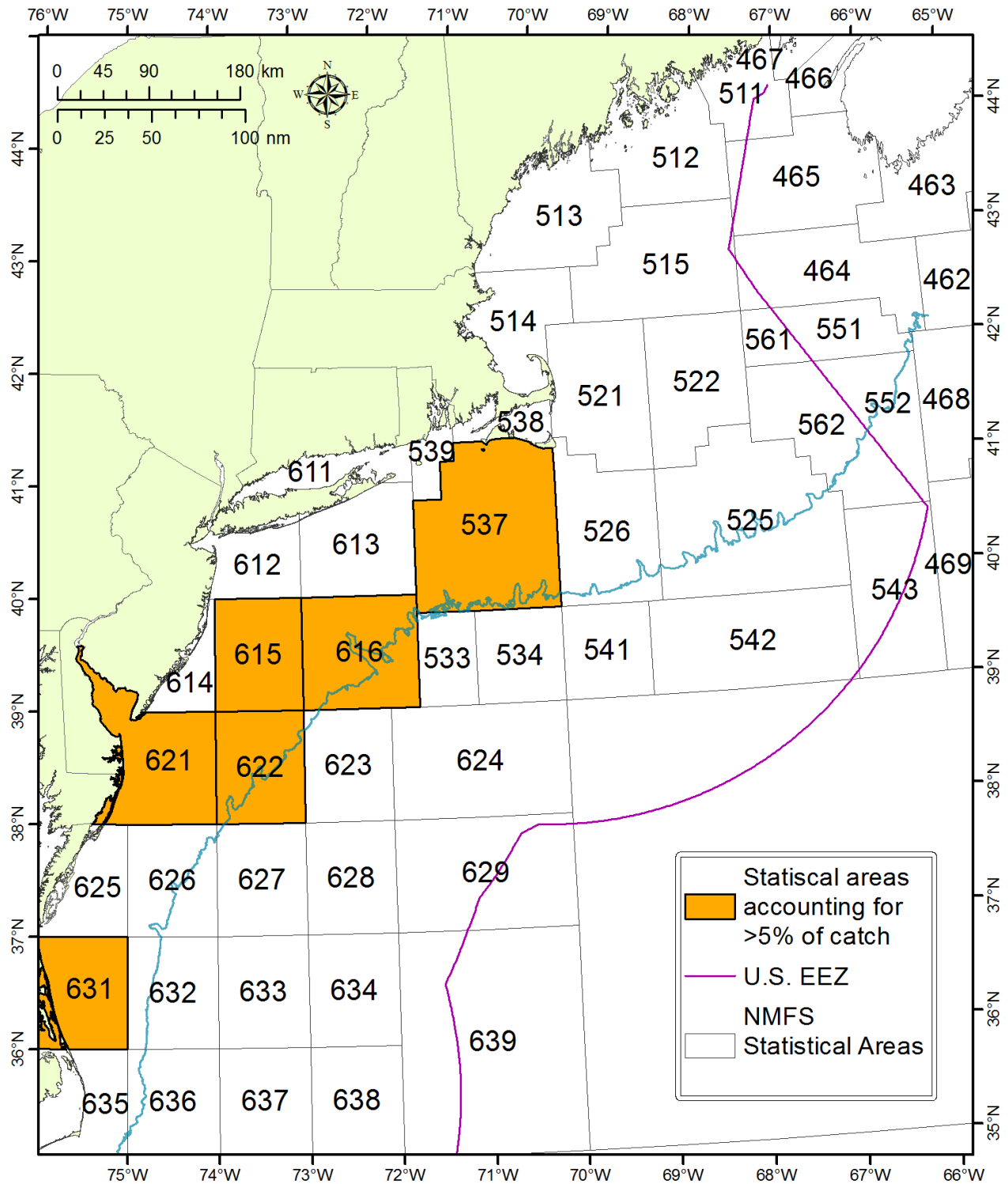


Figure 4: National Marine Fisheries Service Statistical Areas, showing areas accounting for more than 5% of the commercial black sea bass catch in 2013.

Based on VTR data for 2013, the majority of black sea bass landings were reported to be taken by bottom otter trawls (61 percent), followed by pots and traps (26 percent), offshore lobster pots (7 percent), and hand lines (5 percent). Other gear types each accounted for less than 1 percent of landings. Current regulations state that large trawl nets are required to possess a minimum of 75 meshes of 4.5 inch diamond mesh in the codend, or the entire net must have a minimum mesh size of 4.5 inch throughout. The threshold level used to trigger the minimum mesh requirement size is 500 lb from January through March and 100 lb from April through December (Table 1). In addition, the minimum vent size requirements for black sea bass pots/traps are 2.5 inches for circle vents, 2 inches for square vents, or 1.375 by 5.75 inches for rectangular vents. Two vents are required in the parlor portion of the pot/trap.

Black sea bass ex-vessel revenues, based on dealer data, have ranged from \$2.2 to \$7.7 million for the 1994 through 2013 period. The mean price for black sea bass (unadjusted) has ranged from a low of \$1.14/lb in 1996 to a high of \$3.33/lb in 2012 (Figure 5). In 2013, 2.26 million pounds of black sea bass were landed in the commercial fishery, generating \$7.36 million in revenues (\$3.26/lb).

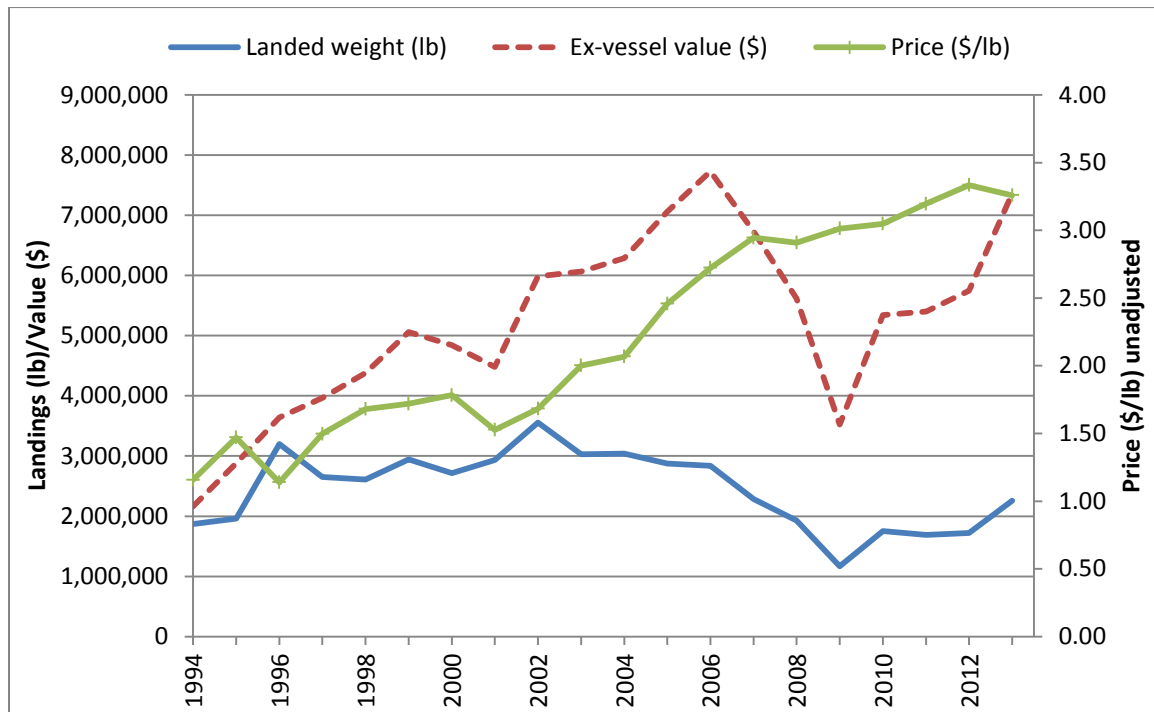


Figure 5: Landings, ex-vessel value, and price (unadjusted) for black sea bass, Maine through North Carolina, 1994-2013.

2013 NMFS dealer data were used to examine recent landings patterns among ports. The top commercial landings ports for black sea bass by pounds landed are shown in Table 4. A “top port” is defined as any port that landed at least 100,000 lb of black sea bass. 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. The ports and communities that are dependent on black sea bass are fully described in Amendment 13 to the FMP. Additional information on "Community Profiles for the Northeast US Fisheries" can be found at: http://www.nefsc.noaa.gov/read/socialsci/community_profiles/.

Table 4: Top ports of landing (in lb) for black sea bass (BSB), based on NMFS 2013 dealer data. Since this table includes only the “top ports,” it may not include all of the landings for the year.

Port	Landings of BSB (lb)	# BSB Vessels
OCEAN CITY, MD	219,321	13
PT. PLEASANT, NJ	205,324	40
CAPE MAY, NJ	193,623	38
PT. JUDITH, RI	183,922	135
HAMPTON, VA	151,484	30
CHINCOTEAGUE, VA	143,567	23
NEWPORT NEWS, VA	142,957	29
INDIAN RIVER, DE	C	C
VIRGINIA BEACH, VA	101,806	4

Among the states from Maine through North Carolina, New York had the highest number of Federally permitted dealers (54) who bought black sea bass in 2013 (Table 5). All dealers bought approximately \$7.36 million of black sea bass in 2013.

Table 5: Dealers reporting buying black sea bass, by state in 2013.

Number of Dealers	MA	RI	CT	NY	NJ	DE	MD	VA	NC
	38	38	13	54	26	3	5	17	24

Recreational Fishery

There is a significant recreational fishery for black sea bass in state waters, which occurs seasonally when the fish migrate inshore during the warm summer months. In Federal waters, the recreational black sea bass fishery is managed on a coastwide basis. For the past four years (2011-2014), state waters measures have been set on a state or regional basis, as the result of ASMFC FMP Addendums that have been passed in each of these years. The 2014 recreational fishing measures in Federal waters are given in Table 1, and the 2014 state-specific measures are given in Table 6.

Table 6: Black sea bass recreational fishing measures in 2014, by state.

State	Minimum Size (inches)	Possession Limit	Open Season
New Hampshire	13	10 fish	January 1-December 31
Massachusetts (Private and For-hire)	14	8 fish	May 17- September 15
Massachusetts (For-hire with Letter of Authorization from MA DMF)	14	8 fish	May 17- May 31
		20 fish	September 1- September 30
Rhode Island	13	3 fish	June 29- August 31
		7 fish	September 1- December 31
Connecticut (Private and Shore)	13	3 fish	June 21- August 31
		8 fish	September 1- December 31
CT Authorized Party/Charter Monitoring Program Vessels		8 fish	June 21-December 31
New York	13	8 fish	July 15- December 31
New Jersey	12.5	3 fish	July 1- August 31
		15 fish	May 19- June 30; September 1- September 6; October 18- December 31
Delaware	12.5	15 fish	May 19 - September 18 and October 18 - December 31
Maryland	12.5	15 fish	May 19 - September 18 and October 18 - December 31
PRFC	12.5	15 fish	May 19 - September 18 and October 18 - December 31
Virginia	12.5	15 fish	May 19 - September 18 and October 18 - December 31
North Carolina (North of Cape Hatteras 35° 15'N Latitude)	12.5	15 fish	May 19 - September 18 and October 18 - December 31

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 peaked in 1986 with landings in numbers and weight at the lowest levels in 2011 (Table 7). 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 (≤ 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 black sea bass are landed recreationally, and indicate that a majority of the landings are now occurring in state waters (Table 8).

Table 7: Recreational black sea bass landings and data from the NMFS recreational statistics databases, 1981-2013, Maine through North Carolina.

Year	Catch ('000 of fish)	Landings ('000 of fish)	Landings ('000 lb)
1981	5,301	2,734	1,628
1982	11,615	10,249	10,054
1983	8,707	5,631	4,530
1984	4,330	2,491	1,961
1985	7,131	4,216	2,540
1986	29,167	21,904	12,461
1987	5,912	3,467	2,392
1988	9,363	4,060	3,945
1989	7,000	4,649	3,621
1990	9,622	4,269	3,047
1991	11,224	5,458	4,316
1992	8,296	3,869	2,914
1993	9,451	6,197	4,985
1994	7,688	3,571	3,054
1995	14,481	6,887	6,339
1996	8,437	3,764	4,125
1997	11,088	4,868	4,399
1998	5,699	1,259	1,290
1999	7,758	1,412	1,697
2000	17,667	3,755	4,122
2001	14,626	3,006	3,596
2002	15,080	3,421	4,442
2003	12,649	3,392	3,449
2004	8,884	1,925	2,340
2005	8,358	1,489	2,181
2006	8,729	1,392	1,911
2007	9,601	1,630	2,338
2008	11,102	1,342	2,092
2009	9,875	1,909	2,672
2010	11,133	2,335	3,361
2011	5,794	881	1,267
2012	14,553	1,946	3,305
2013	10,912	1,276	2,441

Table 8: Percentage of black sea bass recreational landings (MRIP Type A+B1 in number of fish) by area (state vs. Federal waters), Maine through North Carolina, 2004-2013. Area information is self-reported based on the area where the majority of fishing activity occurred per angler trip.

Year	State <= 3 mi	EEZ > 3 mi
2004	25.6%	74.4%
2005	29.9%	70.1%
2006	34.9%	65.1%
2007	34.8%	65.2%
2008	60.3%	39.7%
2009	67.5%	32.5%
2010	72.1%	27.9%
2011	63.8%	36.2%
2012	72.6%	27.4%
2013	68.8%	31.2%
Avg. 2004 - 2013	53.0%	47.0%
Avg. 2011 - 2013	68.4%	31.6%

Table 9: State contribution (as a percentage) to total recreational landings of black sea bass, (MRIP Type A+B1 in number of fish), from Maine through North Carolina, 2012 and 2013.

State	2012	2013
Maine	0.0	0.0
New Hampshire	0.2	1.0
Massachusetts	26.7	23.8
Rhode Island	5.3	6.0
Connecticut	5.7	8.3
New York	16.5	26.4
New Jersey	37.8	25.8
Delaware	2.1	2.0
Maryland	1.7	0.6
Virginia	0.2	1.7
North Carolina	3.9	4.5
Total	100%	100%

In 2013, there were 773 recreational vessels (i.e., party and charter vessels) that held black sea bass Federal recreational permits. Many of these vessels also hold recreational permits for summer flounder and scup. Landings by mode indicate that although party/charter fishermen have historically been responsible for the majority of black sea bass landings, the private/rental fishery has accounted for the majority of landings in recent years (Table 10).

Table 10: The number of black sea bass landed from Maine through North Carolina by mode, 1981-2013.

Year	Shore	Party/Charter	Private/Rental
1981	452,103	1,440,169	841,478
1982	81,445	8,104,204	2,063,334
1983	222,012	4,005,707	1,403,508
1984	98,227	1,128,294	1,264,897
1985	163,448	2,393,049	1,659,700
1986	1,021,525	16,695,387	4,187,084
1987	71,956	1,157,243	2,238,159
1988	140,754	1,691,300	2,227,901
1989	237,970	1,991,672	2,419,654
1990	289,378	2,268,915	1,710,455
1991	250,675	2,586,145	2,621,271
1992	45,369	2,043,190	1,780,224
1993	54,676	4,579,662	1,562,227
1994	243,347	2,005,883	1,321,629
1995	275,982	5,197,231	1,413,571
1996	70,523	2,631,733	1,062,027
1997	8,337	3,950,336	908,836
1998	7,073	777,874	474,069
1999	19,231	621,354	771,260
2000	177,489	1,797,702	1,780,240
2001	14,035	1,826,852	1,164,977
2002	16,618	2,066,232	1,338,448
2003	10,760	2,073,132	1,308,493
2004	9,462	698,453	1,217,160
2005	13,110	605,932	869,467
2006	49,080	730,749	612,618
2007	9,865	909,869	709,901
2008	9,447	479,682	852,619
2009	23,992	442,107	1,442,842
2010	6,096	519,529	1,809,046
2011	8,177	310,760	561,730
2012	6,443	701,777	1,237,668
2013	12,205	228,574	1,035,530
% of total, 1981 - 2013	3%	60%	37%
% of total, 2009 - 2013	1%	26%	73%

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 by recreational fishermen in the Northeast region by mode, in 2011. Source: Lovell et al. 2013.

Expenditures	\$		
	Party/Charter	Private/Rental	Shore
Auto Fuel	24.92	13.50	13.25
Auto Rental	0.43	0.00	0.09
Bait	0.47	4.98	5.09
Boat Rental	0.52	18.40	0.00
Charter Fees	113.44	0.05	0.00
Crew Tips	9.95	0.00	0.00
Fish Processing	0.01	0.00	0.00
Food from Grocery Stores	12.09	6.11	6.22
Food from Restaurants	11.25	2.28	4.07
Gifts & Souvenirs	3.57	0.03	0.57
Ice	0.56	1.04	0.57
Lodging	17.42	1.35	7.69
Parking & Site Access	0.67	0.82	1.27
Public Transportation	1.56	0.05	0.15
Tournament Fees	3.77	0.00	0.00
Total	200.63	48.62	38.96

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

Drohan AF, Manderson JP, Packer DB. 2007. Essential fish habitat source document: Black sea bass, *Centropristis striata*, life history and habitat characteristics, 2nd edition. NOAA Tech Memo NMFS NE 200; 68 p.

Lovell, Sabrina, Scott Steinback, and James Hilger. 2013. The Economic Contribution of Marine Angler Expenditures in the United States, 2011. U.S. Department of Commerce, NOAA Tech. Memo. NMFS-F/SPO-134, 188 p.

Shepherd, G.R. 2012. Black Sea Bass Assessment Summary for 2012. Northeast Fisheries Science Center.

Steimle, F.W, C. A. Zetlin, P. L. Berrien, and S. Chang. 1999. Essential Fish Habitat Source Document: Black Sea Bass, *Centropristis striata*, Life History and Habitat Characteristics. NOAA Technical Memorandum NMFS-NE-143

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.

Northeast Data Poor Stocks Working Group (DPSWG). 2009. The Northeast Data Poor Stocks Working Group Report, December 8-12, 2008 Meeting. Part A. Skate species complex, deep sea red crab, Atlantic wolffish, scup, and black sea bass. US Dept Commer, Northeast Fish Sci Cent Ref Doc. 09-02; 496 p.