

A SURVEY OF THE SEA BASS FISHERY

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The authors present the results of interviews with sea bass fishermen along the Atlantic coast of the United States (Massachusetts-South Carolina) during 1971. Two sea bass species are reported in the catch statistics: *Centropristis striata* and *Centropristis philadelphica*. Both are captured by trawls and traps. Trawls account for 64% of the total catch; traps for 35%. The catch per unit of effort for trap fishermen ranges from 0.72 to 176.47 pounds per trap-day.

Very little scientific information is available on the sea bass fishery along the Atlantic coast of the United States. In 1971 we decided to interview sea bass fishermen and gather information on the catch, type of gear, and catch per unit of effort in different areas so that future studies of the fishery could be formulated. After reviewing the sea bass literature, we found a few studies dealing with catch and gear type--but no studies on effort and catch per unit of effort. Investigations have been primarily concerned with geographic distribution (Baird, 1873; Smith, 1907; Bullis and Thompson, 1965; Struhsaker, 1969), embryology (Wilson, 1889), or movement and spawning (Sherwood and Edwards, 1901). Only Lavenda (1949) has aged the black sea bass and measured the differences that occur between the sexes.

The black sea bass (*Centropristis striata*) ranges from Massachusetts to Florida; the rock sea bass (*Centropristis philadelphica*) from North Carolina into the Gulf of Mexico. Although both species are exploited throughout their range, our survey extended only from Massachusetts to South Carolina. For survey purposes, we divided the area into three regions: North Atlantic (Massachusetts, Rhode Island, Connecticut, New York), Middle Atlantic (New Jersey, Maryland, Delaware, Virginia), and South Atlantic (North and South Carolina).

GEAR AND SEASONS

Trawls for capturing sea bass range in size from a No. 35 to a No. 41 Yankee (Knake, 1956). Bosom and wing foot ropes have wooden or rubber rollers and the cod-end is

protected by chafing gear. Trawls are fished over a wide range of depths, 50 feet in the North Atlantic to greater than 300 feet in the Middle Atlantic. Trawling is restricted, however, to firm bottoms in the vicinity of rocks, wrecks, and reefs. South Atlantic fishermen refer to the low profile coral formations as "live bottom." The bulk of the trawl catches in the North Atlantic are confined to two periods, March to June and September to November. Landings in the Middle and South Atlantic are greatest during September to March, although fishing is conducted throughout the year.

Wooden and wire traps are designed to catch sea bass. Within each category there is a traditional and a modern trap (Table 1). Traditional wooden traps are used in the Middle and North Atlantic (Fig. 1). In New York, the traditional sea bass traps have been modified to catch American lobster (*Homarus americanus*); sea bass landings by these traps are incidental to the lobster catch. Each fisherman in the Middle Atlantic lifts a part of his several hundred wooden sea bass traps each fishing day. No baits are used because, according to fishermen, they attract crabs. As a result of declining fish catches in recent years, some fishermen in the Middle Atlantic States have shifted to a modern trap, which is designed to capture light poundages of both lobster and sea bass (Fig. 2). Depths fished in the Middle Atlantic range from 65 feet to 110 feet over rocks and reefs (Table 2). All traps are first set in May and are removed from the water for storage in November. The largest catches are made in May and October. In the South

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Table 1 - Measurements taken from the sea bass traps (in inches)

Fishing Regions	Trap Description	Height	Width	Depth	First net			Second net		
					Height	Width	Depth	Height	Width	Depth
Middle Atlantic (New Jersey, Maryland, Virginia)	<u>Wood</u> Traditional	14	18	47	5	5	12	10	1½	9
	Modern	20	29	48	7	8	16	5	9	12
South Atlantic (North Carolina, South Carolina)	<u>Wire</u> Traditional	24	24	24	6	9	5	10		4
	Modern	36	36	36	14	10	9	24		9

Table 2 - Summary of information taken from interviews with trap fishermen, 1971: fishing seasons and depths

Port	Max. # of trap fishermen	Trap type	Season	Best months in season	Poor months in season	Fishing depths
Cape May and Wildwood, N. J.	10	wood	May- November	May, October	July, August	May-June 65'-95' Jul.-Nov. (95'-135')
Ocean City, Maryland	3	wood	May- October	May, June, October	July, August	May-June 65'-75' Jul.-Nov. (75'-85'- 95'-125')
Chincoteague, Virginia	2	wood	May- September	May, June	July, August	all months 100'-110'
Sneads Ferry, North Carolina	4 (40 in season)	wire	all year	September- February	May, July	random 45'-120'
Southport, North Carolina	2 (13 in season)	wire	all year	September- March	July, August	Oct. 65' Dec. 80' Feb. 95' Apr. 100' June 120'
Wilmington North Carolina	1	wire	all year	September- December	May- August	-
Little River, South Carolina	3	wire	September- June	-	-	random 75'-120'
McClellansville, South Carolina	5	wire	November- June	-	-	random 75'-130'

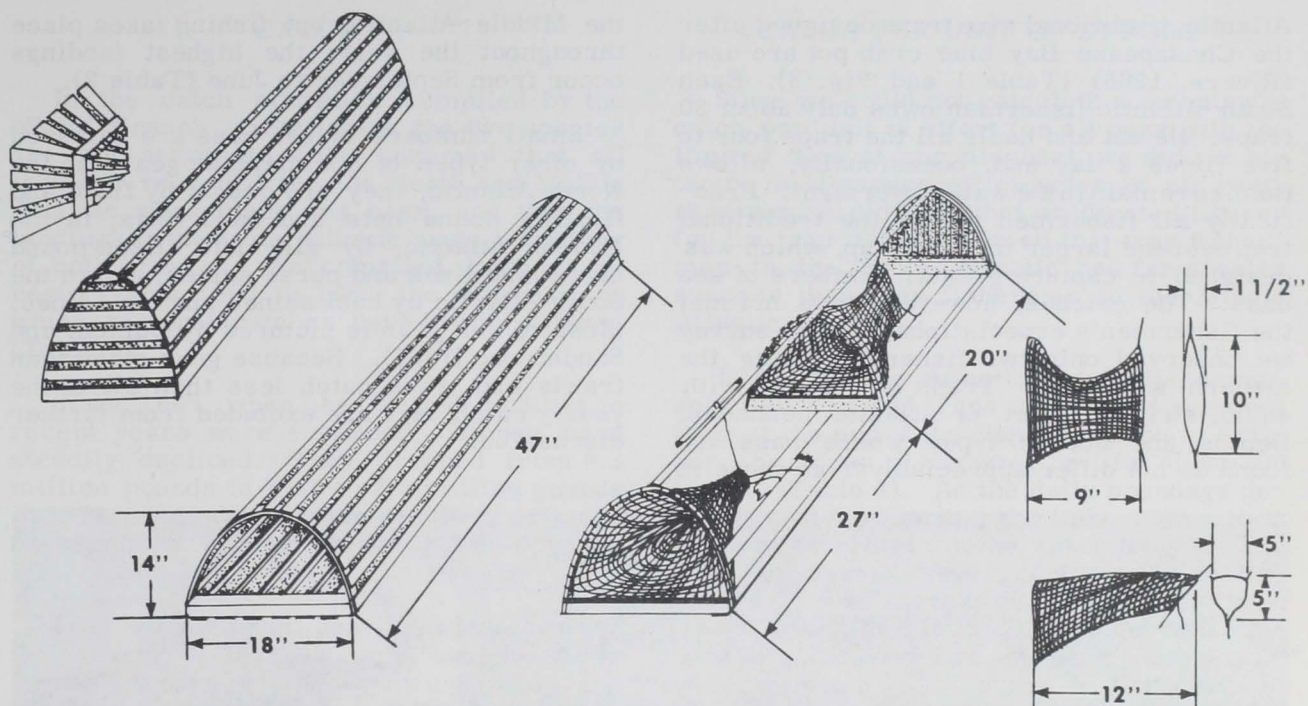


Fig. 1 - Traditional sea bass trap used by fishermen in New Jersey, Maryland, and Virginia. In the upper left is a sea bass trap modified for lobster fishing.

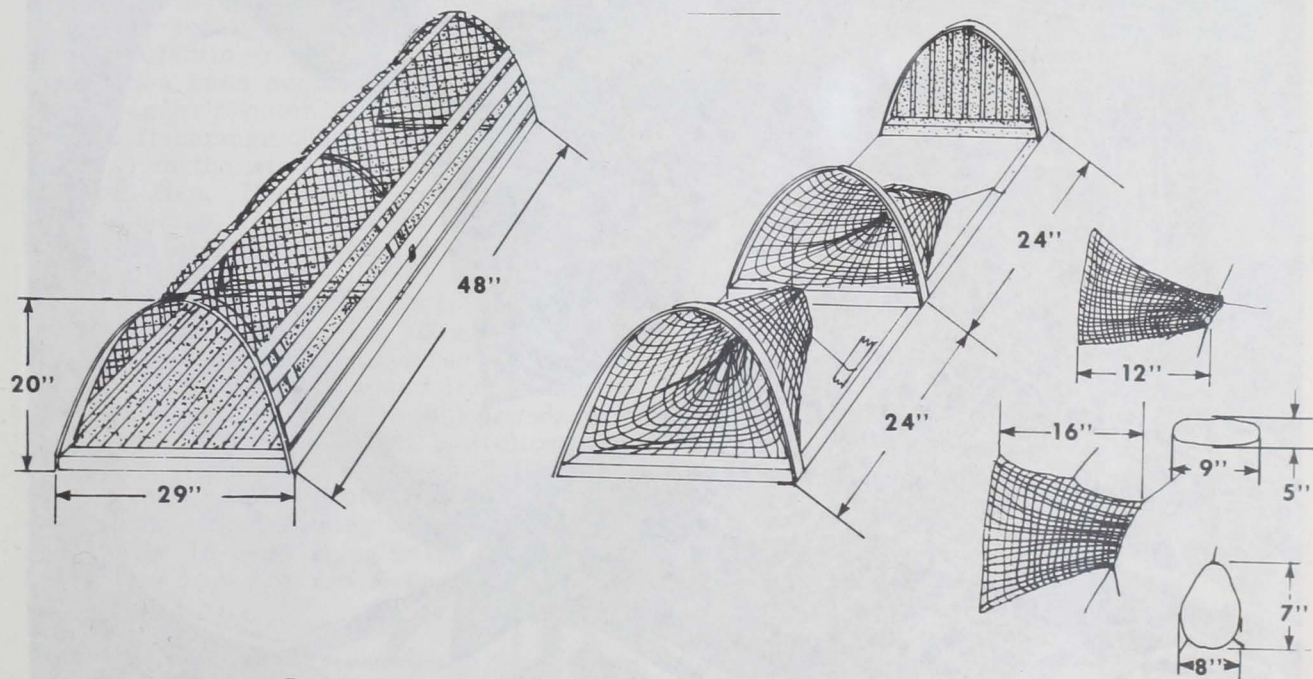


Fig. 2 - A modernized sea bass-lobster trap utilized by fishermen in New Jersey.

Atlantic, traditional wire traps designed after the Chesapeake Bay blue crab pot are used (Rivers, 1966) (Table 1 and Fig. 3). Each South Atlantic fisherman owns only about 30 traps. He set and hauls all the traps four to five times a day and, occasionally, allows them to remain in the water overnight. Practically all fishermen prefer the traditional trap over the larger modern trap, which was designed to capture greater numbers of sea bass. The catches, however, have not met the fishermen's expectations. In our survey we observed only two fishermen using the modern wire trap. Traps are baited with squid, striped mullet, or Atlantic menhaden. Depths and bottom types where bass are found do not differ appreciably from those in

the Middle Atlantic, but fishing takes place throughout the year; the highest landings occur from September to June (Table 2).

Small numbers of sea bass are captured by other types of commercial gear. In the North Atlantic, they are caught by fixed and floating pound nets and hand lines; in the Middle Atlantic, by gill nets, fixed pound nets, hand lines and purse seines; and in the South Atlantic by haul seines and hand lines. Most of this gear is pictured by Dumont and Sundstrom (1961). Because gear other than trawls and traps catch less than 2% of the yearly catch, they are excluded from further discussion.



Fig. 3 - John Muellerweiss of Southport, North Carolina, positions a traditional wire trap on his vessel's stern, prior to baiting and discharging the trap.

CATCH

In the catch statistics compiled by the NMFS Branch of Statistics, the two species are not separated. We assumed that all landings recorded for the North and Middle Atlantic were black sea bass, and that the landings in the South Atlantic were a mixture of both species. We compiled landings by region from 1960 to 1968, the last year for which regional catches have been published (Table 3).

Since 1965, when the largest landings in recent years were recorded, catches have steadily declined. They dropped from 8.8 million pounds in 1965 to 2.8 million pounds in 1971. This decline has resulted, primarily, from a drop in trawl catches in the Middle Atlantic.

Of the commercial gear, trawls accounted for the largest percentage of the catch, followed by traps (wooden and wire). The trap catch exceeded the trawl catch in only one year, 1967. Since 1960, trawls have averaged 64% of the total catch; 5% landed in the North Atlantic, 50% in the Middle Atlantic, and 9% in the South Atlantic. Most catches by trawlers--locally called draggers--in the Middle Atlantic are landed at Hampton, Virginia. Sea bass account for only a fraction of a dragger's catch. In the South Atlantic, shrimp fishermen change to a different type of trawl in the winter (November to March) to catch fish. During the recent decline in total landings, trawl catches of sea bass in the South Atlantic have been increasing.

The trap fishery accounts for an average of 35% of the total landings. When this figure is added to the trawl landings, 99% of the sea bass catch can be accounted for. Like the trawl landings, however, lowest poundage is landed in the North Atlantic (2%), followed by the South Atlantic (10%), and the Middle Atlantic (23%). In the South Atlantic, captains who operate sport-fishing vessels during the summer begin trap fishing in the fall. These boats account for the major part of the North Carolina catch.

Figures for the catch landed by anglers are not available. The catch appears to be large. Deuel and Clark estimated the 1965 landings in the North and Middle Atlantic at 9.1 million pounds, 300,000 pounds greater than the total commercial catch.

CATCH PER UNIT OF EFFORT

Since we could not calculate a meaningful catch per unit of effort for all gear with the limited data at our disposal, we did not attempt to compare efficiencies of all gear. However, we did find that unadjusted figures for the trap fishery showed that trap fishermen in the South Atlantic had far greater success than trap fishermen in the Middle Atlantic.

In the Middle Atlantic, a trap fisherman sets 400 to 1,500 traps in May and removes them at the end of the fishing season in October. Each day of the week he lifts about 200 traps. (Table 4). As the daily poundage decreases in late spring, the fisherman allows the gear to remain in the water longer. The daily poundage, however, continues to decline even with the increased gear fishing time. These opposing factors act to decrease the CPUE. The problem of gear fishing time does not occur in the South Atlantic because a fisherman either fishes his 30 traps 4 to 5 times a day or he does not fish.

Examination of the Middle Atlantic fishing success shows that the maximum CPUE increased with each port to the south (Table 4). Since the mean fishing time decreased only slightly, the higher CPUE resulted from increased catches. The best landings occurred at the southernmost port, Chincoteague, Virginia.

In the South Atlantic, where two sea bass species are caught, the maximum CPUE was higher than any port in the Middle Atlantic. The best catches occurred at Sneads Ferry, North Carolina, where the average landings exceeded 3,000 pounds in the fall and winter. Maximum CPUE values for North and South Carolina ports fell in the range 8.11 to 178.57.

Conclusions

Trawls and trap account for 99% of the commercial sea bass catch. Most of the catch (73%--average for the years 1960-1968) is landed in the Middle Atlantic, followed by the South Atlantic (19%). On the basis of the CPUE, the trap fishermen in the South Atlantic are more successful than the trap fishermen in the Middle Atlantic. We believe their greater success results from a greater abundance of sea bass. Whether

Table 3.--Landings of sea bass by gear recorded by the Branch of Statistics, National Marine Fisheries Service.

Year	NORTH ATLANTIC					MIDDLE ATLANTIC				SOUTH ATLANTIC				TOTAL ²
	Otter Trawls	Fixed Pound Nets	Floating Pound Nets	Hand Lines	Wooden Traps	Otter Trawls	Fixed Pound Nets	Hand Lines	Wooden Traps	Otter Trawls	Hand Lines	Wire Traps	Misc. Gear All ¹ Areas	
1960	629,000	3,000	140,200	1,920	55,900	4,733,200	13,600	14,400	1,235,600	37,000	85,500	33,000	100	6,982,420
1961	378,900	4,200	112,900	3,000	76,500	3,750,200	700	5,200	1,089,500	326,400	112,600	519,800	300	6,380,200
1962	524,700	2,200	95,200	1,100	115,000	4,833,600	1,700	10,000	2,241,400	971,200	61,900	521,600	400	9,380,000
1963	469,700	900	76,000	400	188,800	5,069,400	800	6,700	2,351,300	525,900	89,500	387,700	3,000	9,170,100
1964	367,500	1,600	127,400	500	184,400	4,062,300	700	13,000	2,161,200	613,700	61,500	464,800	--	8,058,600
1965	272,300	1,900	83,800	300	155,400	4,792,100	300	10,400	2,348,500	629,000	66,900	476,700	100	8,837,700
1966	182,000	4,300	63,300	200	51,400	1,876,800	2,500	1,400	1,170,500	639,400	38,500	591,100	4,100	4,625,500
1967	54,700	5,200	39,400	400	64,900	1,352,400	--	3,600	1,020,600	641,000	8,500	1,410,200	--	4,600,900
1968	73,900	2,500	33,900	500	6,900	1,553,800	400	1,800	703,700	626,400	38,700	731,600	--	3,774,100

¹Haul seines, purse seines, gill nets.

²The last complete digest was in 1968. For the years 1969-1971 the Interim Reports estimated total catch 1969: 4,400,000; 1970: 4,482,000; 1971: 2,821,000.

Table 4.--Summary of information taken from interviews with trap fishermen, 1971, calculation of mean catch per unit of effort (CPUE).

Ports	Mean no. traps per boat	Mean no. times each trap lifted per day	Mean no. traps fished per day per vessel	Mean no. trap days per lift	Mean no. trap days	Range in mean no. pounds caught per day per vessel		CPUE Range (Mean no. pounds per trap day)	
						Low	High	Low	High
Cape May and Wildwood, New Jersey	950	0.21	200	4.75	950	144	875	0.15	0.92
Ocean City, Maryland	1,165	0.21	250	4.66	1,165	366	1,966	0.31	1.69
Chincoteague, Virginia	1,125	0.22	250	4.50	1,125	625	3,500	0.56	3.11
Sneads Ferry, North Carolina	21	4.00	21	0.25	21	200	3,750	9.52	178.57
Southport, North Carolina	25	4.00	25	0.25	25	225	2,000	9.00	80.00
Wilmington, North Carolina	37	2.00	37	0.50	37	200	1,700	5.41	45.95
Little River, South Carolina	37	4.00	37	0.25	37	300	1,500	8.11	40.54
McClellansville, South Carolina	31	4.00	31	0.25	31	500	2,000	16.13	64.52

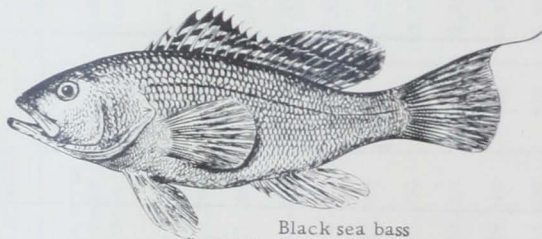
the greater abundance is due to the presence of two species, we do not know, since we made no attempt to assess the relative proportions of each species in the catch

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Black sea bass
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