

# Composition of Catches Made by Anglers Fishing for Summer Flounder, *Paralichthys dentatus*, From New Jersey Party Boats in 1978

DARRYL J. CHRISTENSEN and WALTER J. CLIFFORD

## Introduction

The summer flounder, *Paralichthys dentatus*, is a highly prized food fish sought by both recreational and commercial fishermen along the New Jersey coast. McHugh (1977) summarized the commercial and recreational catches from 1960 through 1975. He found that New Jersey commercial catches declined from a high of 2,882 metric tons (t) in 1960 to a low of 578 t in 1969, and then increased to 1,957 t in 1975. While the New Jersey recreational catches of summer flounder have not been estimated, the regional recreational catches from New Jersey through North Carolina in 1960 (Clark, 1962), 1965, (Deuel and Clark, 1968), and 1970 (Deuel, 1973) were approximately equal to the commercial landings in the same area and years (McHugh, 1977). This survey was conducted to document the current catch rates made aboard party boats in New Jersey as well as the size and age composition of this component of the total fishery.

Angler interviews and other data were collected aboard party boats fishing between Sandy Hook and Barnegat Inlet from just outside the surf zone up to 1 mile offshore. Both full-day party boats, which usually make a

Darryl J. Christensen and Walter J. Clifford are with the Sandy Hook Laboratory, Northeast Fisheries Center, National Marine Fisheries Service, NOAA, Highlands, NJ 07732.

single 7-9 hour trip, and half-day party boats, which usually make a 4-5 hour trip each morning and afternoon, were surveyed for catch rates and size and age composition.

## Methods

Seventeen sampling dates were picked randomly from a 12-week period beginning 18 June and ending 10 September 1978. A list was prepared in June containing the names of the full-day and half-day party boats in Atlantic Highlands, Belmar, Brielle, and Point Pleasant, N.J., which advertised "fluke" (summer flounder) fishing. A boat was chosen randomly without replacement from the list for sampling on each of the 17 scheduled days.

On the scheduled day the sampler identified himself to the captain, explained sampling procedures, offered to pay full fare and asked permission to sample aboard the vessel. If the captain refused or the scheduled boat did not sail, an alternate vessel was chosen from the same port. If the boat was a half-day boat, the sampler went

aboard both the morning and afternoon trips. Survey personnel counted each angler who actively fished, measured fish to the nearest centimeter total length, and collected scale and dorsal fin ray samples for subsequent age analysis. During the trip back to port, individual anglers were interviewed to determine their catch for the trip.

Plastic impressions of the summer flounder scales were used to age fish according to basic fisheries techniques (Everhart et al., 1975). Thin cross sections from the bases of dorsal fin rays were used to verify the ages indicated by the scales.

## Results and Conclusions

A survey of the ports in mid-June indicated 6 full-day and 14 half-day boats advertising summer flounder fishing. On the 17 randomly chosen sampling dates, 5 full-day and 12 half-day boats were selected for sampling. Survey personnel completed all of the scheduled trips except for two half-day afternoon trips. Several of the vessels which advertised summer flounder trips in June changed to fishing for blue fish, *Pomatomus saltatrix*, in late July or August. A list of the dates, ports, vessel type, number of trips, and number of anglers per trip is presented in Table 1.

A total of 935 out of 1,383 anglers aboard the vessels were interviewed. The combined catch of 139 full-day anglers was 438 summer flounder with a mean of 3.15 fish per angler trip. The combined catch of 796 half-day anglers was 1,484 summer flounder with a mean of 1.86 fish per angler per trip. Full-day boats carried 30 anglers and landed an estimated mean of 96 summer flounder per boat trip while

*ABSTRACT*—Anglers were interviewed while fishing for summer flounder, *Paralichthys dentatus*, along the New Jersey coast from party boats. Mean seasonal catch rates for full-day and half-day anglers were 3.15 and 1.86 summer flounder per man per trip, respectively, from 19 June to 1 September 1978. Other fish

species made up less than 10 percent of the catch. A total of 828 summer flounder were measured and ages were determined for 427 specimens. Analysis of the age-length data indicates that II +, III +, IV +, V +, and >V + age summer flounder made up 4.3, 73.0, 20.3, 1.8, and 0.6 percent of the catch, respectively.

half-day boats carried a mean of 56 anglers per trip and landed an estimated mean of 104 summer flounder per boat trip.

The catches of individual anglers were examined on a trip-by-trip basis. This examination revealed that a distinct change in the success of individual anglers occurred between 10 and 11 July. Prior to July, only 10 percent of the full-day anglers and 11 percent of the half-day anglers failed to catch at least one summer flounder. After 11 July, 49 and 54 percent of the full-day and half-day anglers, respectively, were unsuccessful. The change in proportion of successful fishermen is readily apparent as illustrated in Figure 1. The cause of the decline in catch is unknown. It was sufficient to reduce the mean catch per full-day angler from 5.22 before 11 July to 1.49 after 11 July and to reduce the mean catch per half-day angler from 3.00 before 11 July to 1.06 after 11 July.

Other species were caught incidental to the catch of summer flounder. The total incidental catch of the 935 anglers interviewed was 62 windowpane, *Scophthalmus aqosus*; 40 smooth dogfish, *Mustelus canus*; 52 searobins, *Prionotus* sp.; 33 black sea bass, *Centropristis striata*; 8 bluefish, *Pomatomus saltatrix*; 2 banded rudderfish, *Seriola zonata*; 2 skates, *Raja* sp.; 1 sand tiger, *Odontaspis taurus*; and 1 unidentified "sand" shark, *Carcharhinus* sp. The incidental catch was only 201 fish or less than 10 percent of the total numbers of all fish caught by the anglers interviewed.

During the survey 828 summer flounder were measured and 427 age samples collected. Both number and percent frequencies of all fish measured and those from which age samples were collected are presented in Table 2. The ages at length for each centimeter group in the age sample is given in Table 3. It was assumed that all fish not aged which measured less than 27 cm were II + fish and all those measuring over 59 cm were older than V + fish. The percentage of each age at each length group was multiplied by the total number of fish measured in

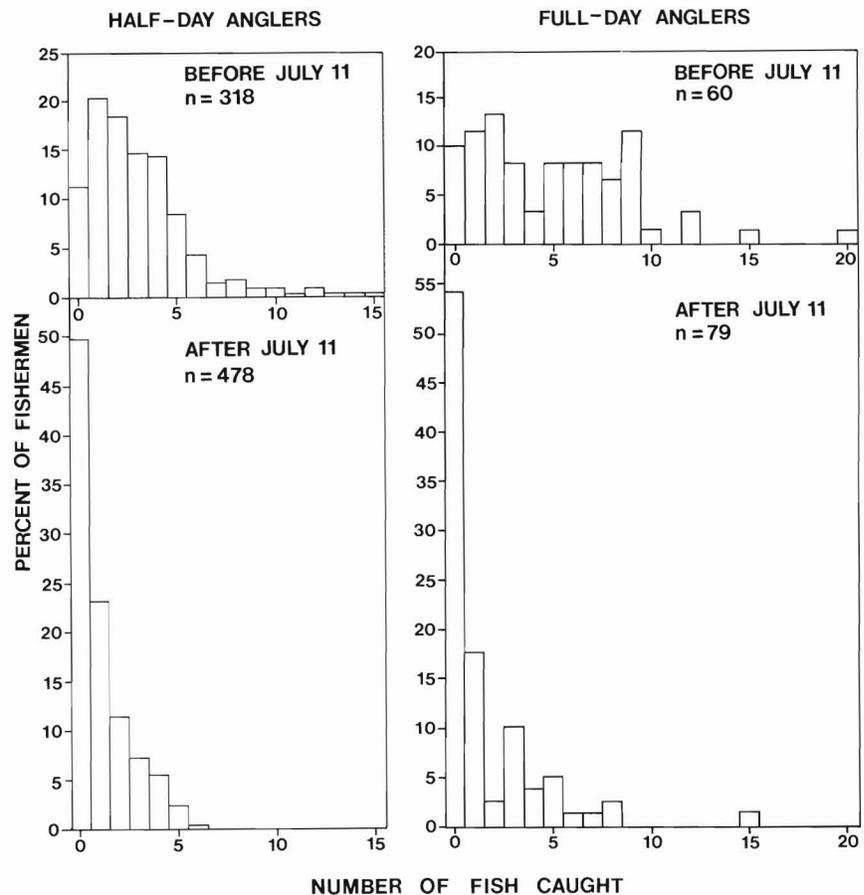


Figure 1.—Distribution of individual catches of full-day and half-day anglers before and after July 11.

Table 1.—Dates, ports, boat types, number of trips, and number of anglers aboard New Jersey party boats sampled for summer flounder catches in 1978.

Date	Port	Boat type	No. of trips	No. of anglers aboard the vessel	
				Full-day	a.m. p.m.
6/19	Point Pleasant Beach	½-day	2		36 58
6/23	Belmar	½-day	2		54 30
6/25	Point Pleasant Beach	½-day	2		74 65
6/29	Atlantic Highlands	Day	1	39	
7/01	Point Pleasant Beach	½-day	2		98 102
7/10	Brielle	Day	1	30	
7/12	Belmar	½-day	2		78 56
7/18	Brielle	Day	1	44	
7/20	Belmar	½-day	2		50 35
7/25	Point Pleasant Beach	½-day	2		111 65
8/01	Point Pleasant Beach	½-day	1		15 —
8/11	Belmar	½-day	2		42 25
8/12	Point Pleasant Beach	½-day	2		48 63
8/15	Brielle	Day	1	24	
8/22	Brielle	½-day	1		54 —
8/24	Belmar	½-day	2		32 40
9/01	Brielle	Day	1	15	

that group to determine the numbers caught for each age group (Table 4). The percent age composition of the

catch (Table 4) was 4.3, 73.0, 20.2, 1.9, and 0.6 for II+, III+, IV+, V+, and >V+ fish, respectively.

**Table 2.—Length frequencies and percent length frequencies of 828 summer flounder measured and 427 from which age samples were taken.**

Length (cm)	Length frequencies all fish measured		Length frequencies age sampled fish	
	Number	Percent	Number	Percent
23	4	0.48		
25	4	0.48		
26	6	0.72		
27	6	0.72	1	0.23
28	6	0.72	2	0.47
29	10	1.21	3	0.70
30	19	2.29	8	1.87
31	17	2.05	6	1.40
32	41	4.95	26	6.09
33	59	7.13	29	6.79
34	70	8.45	39	9.13
35	66	7.97	41	9.60
36	79	9.54	46	10.77
37	45	5.43	22	5.15
38	61	7.37	37	8.66
39	38	4.59	17	3.98
40	69	8.33	35	8.19
41	38	4.59	23	5.39
42	32	3.86	15	3.51
43	37	4.47	16	3.75
44	26	3.14	15	3.51
45	17	2.05	5	1.17
46	17	2.05	11	2.58
47	10	1.21	4	0.94
48	12	1.45	5	1.17
49	3	0.36	2	0.47
50	9	1.08	4	0.94
51	3	0.36	1	0.23
52	5	0.60	4	0.94
53	2	0.24	1	0.23
54	8	0.97	4	0.94
55	4	0.48	3	0.70
60	1	0.12		
61	1	0.12		
64	1	0.12		
65	1	0.12	1	0.23
66	1	0.12	1	0.23

**Table 3.—Age and length of summer flounder caught by anglers aboard party boats in New Jersey during 1978.**

Length (cm)	Age class							
	0+	I+	II+	III+	IV+	V+	VI+	VII
27			1					
28				2				
29				3				
30			3	5				
31			1	5				
32				24	2			
33			1	26	2			
34			1	36	2			
35				36	5			
36			1	43	2			
37				19	3			
38				29	8			
39				15	2			
40				26	9			
41				15	7	1		
42				10	5			
43				11	5			
44				11	4			
45				3	2			
46				2	7	2		
47				1	3			
48				1	4			
49					2			
50				1	3			
51					1			
52				1		3		
53					1			
54					2	2		
55					1	2		
64								1
65								1
66								1
Class total	0	0	8	325	82	10	0	2
Percent total	0.0	0.0	1.9	76.1	19.2	2.3	0.0	0.5

**Table 4.—Expanded numbers, percent age composition, and mean length at age of the party boat summer flounder catch.**

Length (cm)	Age class				
	II+	III+	IV+	V+	>V+
23	4				
25	4				
26	6				
27	6				
28		6			
29		10			
30	7	12			
31	3	14			
32		38	3		
33		53	4		
34	2	64	4		
35		58	8		
36	2	73	4		
37		39	6		
38		48	13		
39		28	10		
40		51	18		
41		24	12	2	
42		21	11		
43		25	12		
44		19	7		
45		10	7		
46		3	11	3	
47		3	7		
48		2	10		
49			3		
50		2	7		
51			3		
52		1		4	
53			2		
54			4	4	
55			1	3	
60					1
61					1
64					1
65					1
66					1
Total number	36	604	167	16	5
Percent by age class	4.3	73.0	20.2	1.9	0.6
Mean length at age	28.3	36.8	42.2	50.6	

The mean total lengths at time of capture for age II+, III+, IV+, and V+ fish were 28.3, 36.8, 42.2, and 50.6 cm, respectively (Table 4).

Samples of fish from recreational surveys have been aged using otoliths instead of scales by Poole (1961) for Great South Bay, N. Y., and by Smith and Daiber (1977) for Delaware Bay. Smith and Daiber concluded that the first well defined annuli in the otoliths were formed at age II and their ages agreed with Poole's ages when adjusted 1 year forward. The ages of coastal New Jersey summer flounder

determined in this study confirm the observations of Smith and Daiber.

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