# Age composition of the 1978 spring recreational catch of Atlantic mackere1, Scomber scombrus, <br> in the Middle Atlantic region 

by

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Age samples of Atlantic mackerel, Scomber scombrus, were collected by NMFS personnel as part of a survey of the 1978 recreational mackerel catch of the Middle Atlantic region funded by the Mid-Atlantic Fisheries Management Council. The results of that survey have previously been reported (Christensen et al., 1979). Age analysis of the samples was not completed in time to be included in that report.

## METHODS

Mackerel were obtained in April 1978 from recreational and commercial fishermen fishing primarily along the New Jersey coast and transported to the Sandy Hook Laboratory where they were meassured to the nearest centimeter fork length and sexed. The heads were removed, frozen, and sent to the Woods Hole Laboratory for otolith removal and aging. Aging was accomplished by placing intact otoliths in black trays, imbedding them in clear epoxy resin, and counting annular rings using reflected light at 25-75x magnification under a binocular microscope.

A total of 2,778 mackerel caught by recreational anglers from charter-, party-, and private-boats off Delaware, New Jersey, and New York were measured to the nearest centimeter fork length (Christensen et al., 1979). The number of fish measured at each centimeter length increment was multiplied by the percentage composition of each age at the same length increment to determine the number of fish caught in
each age group at each increment. The numbers at each age were summed from all length increments. The sums at each age were divided by the total number of fish measured to determine the percentage composition of each age in the recreational catch. The percentage composition at each age was multiplied by the total estimated Middle Atlantic catch of 3,795 metric tons (Christensen et al., 1979) to determine the estimated total recreational catch by age class in the Middle Atlantic region.

## RESULTS

A total of 278 mackerel were aged. The percentage composition of each age at each centimeter length interval is listed in Table 1. The length frequency of all fish measured during the 1978 spring recreational survey is illustrated in Figure 1. The range in fork length was 27 to 44 cm and the mean fork length was 37.9 cm . The estimated number of fish in each age group at each length interval, the estimated total number and percent by age group, the mean length for each age group, and total estimated Middle Atlantic catch by age class is listed in Table 2. The fish ranged in age from 2 to $>11$ years old. Ages 2, 3, $4,5,6,7,8,9,10$, and 11 made up $.1,2.4,7.8,5.7,12.0,10.1$, $2.9,22.9,2.4$, and $26.6 \%$ respectively of the recreational catch in 1978.

It is apparent from Table 2 that fish caught by recreational anglers came mainly from the older age classes. The remnants of the
large 1967 and 1969 year classes which were 11 and 9 years old respectively in 1978 still contributed nearly $50 \%$ of the total 1978 recreational catch. The age composition of the recreational catch differs significantly from the age composition of the total stock indicated by analysis of the NMFS 1978 spring bottom trawl surveys (Anderson and Overholtz, 1978). Comparisons of the two age composition estimates indicates that all age classes older than 5 are over represented in the recreational harvest. For example, ages 9 and up comprised $59.1 \%$ of the recreational harvest and only $4.4 \%$ of the total stock. However, the trawl data does not include catches made in less than 15 fathoms ( 27.4 m ) while most recreational catches are made inshore of the 15 fathom isobath. It is possible that older mackerel tend to concentrate closer to shore than younger mackerel resulting in an increased angler catch of older fish.

Anderson, E. D., and W. J. Overhoitz.
1978. Status of the Northwest Atlantic mackerel stocks - 1978. NMFS, NEFC, Woods Hole Lab. Ref. No. 78-49 (mimeo).

Christensen, D. J., W. J. Clifford, P. G. Scarlett, R. W. Smith, and

D. Zacchea.
1979. A survey of the 1978 spring recreational fishery for

Atlantic mackerel, Scomber scombrus, in the Middle Atlantic region. NMFS, NEFC, Sandy Hook Lab. Ref. No. 78-43 (mimeo).

Table 2. Numbers, percent age composition, mean length at age of 2,778 recrea-tionally-caught Atlantic mackerel, and estimated catch in metric tons (MT) from New York through Virginia.

| Length (cm) | 2 | 3 | 4 | 5 | 6 | $\frac{\text { Age }}{7}$ | 8 | 9 | 10 | 11 | >11 | Totals |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 27 | 1 |  |  |  |  |  |  |  |  |  |  | 1 |
| 28 | 2 |  |  |  |  |  |  |  |  |  |  | 2 |
| 29 |  |  |  |  |  |  |  |  |  |  |  | 0 |
| 30 |  | 2 |  |  |  |  |  |  |  |  |  | 2 |
| 31 |  |  |  |  |  |  |  |  |  |  |  | 0 |
| 32 |  | 1 | 3 |  |  |  |  |  |  |  |  | 4 |
| 33 |  | 1 | 17 | 5 |  |  |  |  |  |  |  | 23 |
| 34 |  | 8 | 42 | 13 | 4 |  |  |  |  |  |  | 67 |
| 35 |  | 9 | 51 | - 55 | 9 |  |  |  |  |  |  | 12.4 |
| 36 |  | 18 | 35 | 18 | 96 | 35 |  | 53 |  |  |  | 255 |
| 37 |  | 28 | 69 | 41 | 124 | 69 |  | 138 | 14 | 83 | 14 | 580 |
| 38 |  |  |  | 25 | 100 | 176 | 25 | 151 | 25 | 226 |  | 728 |
| 39 |  |  |  |  |  |  | 55 | 221 | 28 | 194 | 83 | 581 |
| 40 |  |  |  |  |  |  |  | 72 |  | 143 | + 72 | 287 |
| 41 |  |  |  | . |  |  |  |  |  | 94 |  | 94 |
| 42 |  |  |  |  |  |  |  |  |  |  | 24 | 24 |
| 43 |  |  |  |  |  |  |  |  |  |  | 5 | 5 |
| 4.4 |  |  |  |  |  |  |  | - |  |  | 1 | 1 |
| Number | 3 | 67 | 217 | 157 | 333 | 280 | 80 | 635 | 67 | 740 | 199 | 2778 |
| Percent | . 1 | 2.4 | 7.8\% | 5.7 | 12.0 | 10.1 | 2.9 | 22.9 | 2.4 | 26.6 | 7.2 | 100.0 |
| Mean Length at Age (cm) | 27.7 | 35.8 | 35.4 | 36.0 | 36.9 | 37.5 | 38.7 | 38.7 | 38.2 | 38.9 | - | - |
| Estimated Total Catch (MT) by Age | 4 | 92 | 296 | 214 | 455 | 383 | 109 | 867 | 92 | 1011 | 272 | 3795 |



Figure 1. Length frequency of a sample of 2,778 Atlantic mackerel caught by recreational anglers along the middle Atlantic coast.

Table 1. Percent age at length for 278 Atlantic mackerel sampled during the 1978 spring season.

| Length (cm) | Age |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | $>11$ |
| 27 | 100.0 |  |  |  |  |  |  |  |  |  |  |
| 28 | 100.0 |  |  |  |  |  |  |  |  |  |  |
| 29 | 100.0 |  |  |  |  |  |  |  |  |  |  |
| 30 |  | 100.0 |  |  |  |  |  |  |  |  |  |
| 31 |  |  | 100.0 |  |  |  |  |  |  |  |  |
| 32 |  | 27.3 | 72.7 |  |  |  |  |  |  |  |  |
| 33 |  | 5.3 | 73.7 | 21.0 |  |  |  |  |  |  |  |
| 34 |  | 12.3 | 63.2 | 19.3 | 5.3 |  |  |  |  |  |  |
| 35 |  | 7.3 | 41.5 | 43.9 | 7.3 |  |  |  |  |  |  |
| 36 |  | 6.9 | 13.9 | 6.9 | 37.9 | 13.9 |  | 20.7 |  |  |  |
| 37 |  | 4.8 | 11.9 | 7.1 | 21.4 | 11.9 |  | 23.8 | 2.4 | 14.3 | 2.4 |
| 38 |  |  |  | 3.4 | 13.8 | 24.1 | 3.4 | 20.7 | 3.4 | 31.0 |  |
| 39 |  |  |  |  |  |  | 9.5 | 38.1 | 4.8 | -3.0 | 14.3 |
| 40 |  |  |  |  |  |  |  | 25.0 |  | 50.0 | 25.0 |
| 41 |  |  |  |  |  |  |  |  |  | 100.0 |  |

