## Longbill Spearfish, *Tetrapturus pfluegeri*, Incidentally Caught by Recreational Billfishermen in the Western North Atlantic Ocean, 1974–86

Recreational billfish surveys have been conducted annually by the National Marine Fisheries Service (NMFS), Southeast Fisheries Center (SEFC), in the Atlantic Ocean off the U.S. east coast, the Gulf of Mexico, the Bahamas, and the Caribbean Sea since 1971. During these surveys, biological samples were collected to determine age and growth parameters, and reproductive biology; and to monitor catch and effort trends of all billfish species. These species include the sailfish, *Istiophorus platypterus*, white marlin, *Tetrapturus albidus*, blue marlin, *Makaira nigricans*, and longbill spearfish, *Tetrapturus pfluegeri*. With the exception of the longbill spearfish, these species have received considerable attention from fisheries scientists (Nakamura 1985). Owing to the rarity of longbill spearfish in coastal waters, there have been very little fisheries information and biological data published (Robins 1975; Nakamura 1985). All spearfish data collected by the NMFS/SEFC during the annual recreational billfish surveys are summarized in this note.

The longbill spearfish is an epipelagic species found in offshore waters throughout the Atlantic Ocean extending from lat. 40°N to 35°S (Nakamura 1985). These fish are commonly caught by foreign longline vessels fishing offshore for tuna (Ueyanagi et al. 1970) but are rarely caught by recreational vessels fishing closer inshore for sailfish and marlin (Beardsley and Conser 1981). Longbill spearfish are incidentally caught by recreational fishermen while trolling for the more popular sailfish and marlin.

Spearfish are caught during the months of March through September, but particularly during the summer (Fig. 1). The shortened seasons for catches in the temperate Gulf of Mexico and Atlantic, contrasted with the extended season in the tropical Caribbean, indicate that spearfish prefer warm offshore water. The fish were caught during daylight, with the majority being caught between the hours of 0800 and 1400 (Table 1). Spearfish feed on a variety of epipelagic organisms (Ovchinnikov 1979). Limited data (29 specimens) showed no distinct preference for either artificial or natural (dead) trolled baits (Table 1).

The average length and weight of the spearfish was 151.8 cm (lower jaw fork length, SD 24.3, $N$ = 35) and 14.7 kg (SD 6.3, $N$ = 38). These lengths and weights are similar to the

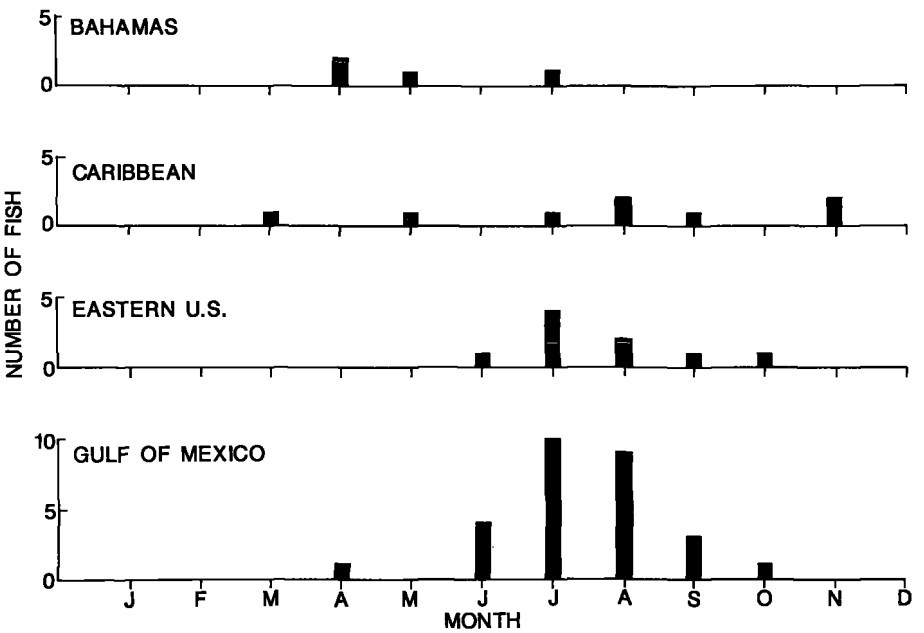


FIGURE 1.—Seasonality, by geographic area, of spearfish observed during annual NMFS/SEFC recreational billfish surveys, 1974–86.

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TABLE 1.—Fishery and biological data of spearfish caught during the annual NMFS/SEFC recreational billfish surveys, 1974–86.

| Fisheries parameter | Number caught | Percent (%) |
|---|---|---|
| Time | | |
| 0600–0800 | 2 | 4.8 |
| 0801–1000 | 10 | 23.8 |
| 1001–1200 | 9 | 21.4 |
| 1201–1400 | 16 | 38.1 |
| 1401–1600 | 4 | 9.5 |
| 1601–1800 | 0 | 0.0 |
| 1801–2000 | 1 | 2.4 |
| Total | 42 | 100.0 |
| Bait | | |
| Artificial | 12 | 41.2 |
| Natural (deed) | 10 | 34.5 |
| Combination | 7 | 24.3 |
| Total | 29 | 100.0 |
| Sex | | |
| Male | 12 | 60.0 |
| Female | 8 | 40.0 |
| Total | 20 | 100.0 |

figures reported by Robins (1975) for recreationally caught spearfish in Florida and are considerably smaller than the reported maximum length of 200 cm and weight of 45 kg (Nakamura 1985). The length:weight relationship of 34 spearfish observed is given in Figure 2. Also, there is no notable sexual dimorphism reflected in the spearfish length-weight relationship (Fig. 2) as reported in other billfish species (Nakamura 1985). This, however, may be an artifact of the small sample size.

The determination of an accurate sex ratio is difficult owing to the small sample size (Table 1) and the large time frame and geographic area from which these data were collected. Of the 20 fish that were reliably sexed, 12 were male and 8 were female; this indicates a male to female ratio of 1:0.66, compared with the 19 specimens and 1:1 ratio observed by Robins (1975) in the Florida recreational billfish fishery. When the two data sets are aggregated to form a larger sample size of recreationally caught spearfish, these data provide a ratio of 1:0.80. Interestingly, Ueyanagi et al. (1970) reported that 106 male and 62 female spearfish were incidentally captured by Japanese tuna longline vessels in the

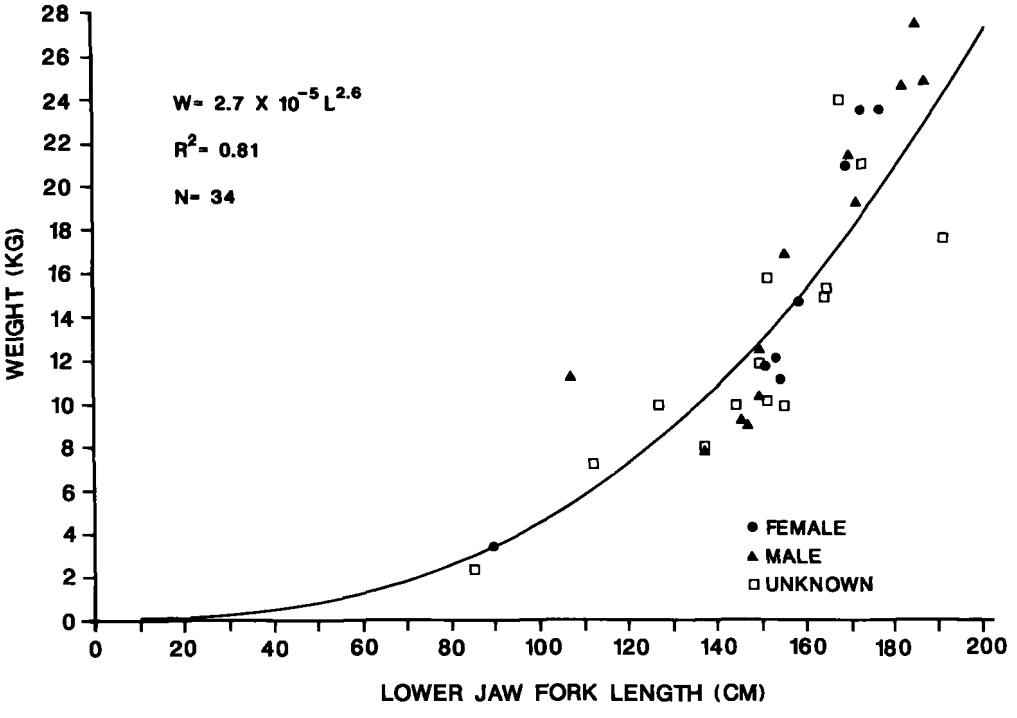


FIGURE 2.—Length:weight relationship of spearfish observed during annual NMFS/SEFC recreational billfish surveys, 1974–86.

western north Atlantic at a ratio of 1:0.58. This suggests that the recreationally derived sex ratios may, in fact, be realistic.

The catch of recreationally caught spearfish varies temporally and spatially (Table 2), with an overall value of 0.00869 fish caught per 100 hours. The Caribbean produced the highest CPUE for spearfish followed by the Gulf of Mexico, the eastern United States, and the Bahamas.

TABLE 2.—Catch and effort (expressed as hours fished) data of spearfish caught during annual NMFS/SEFC recreational billfish surveys, 1974–86.

| Year | Gulf of Mexico catch/effort | Eastern U.S. catch/effort | Caribbean catch/effort | Bahamas catch/effort | Total catch/effort | CPUE[1] |
|---|---|---|---|---|---|---|
| 1974 | 1/11,005 | 0/ 8,728 | 0/ 3,935 | 0/ 6,711 | 1/30,379 | 0.00329 |
| 1975 | 2/15,060 | 0/10,949 | 0/ 3,809 | 0/ 5,879 | 2/35,697 | 0.00560 |
| 1976 | 1/ 8,904 | 0/ 9,077 | 0/ 2,844 | 1/ 5,283 | 2/26,148 | 0.00764 |
| 1977 | 3/11,600 | 0/11,070 | 0/ 2,473 | 0/ 5,200 | 3/30,343 | 0.00988 |
| 1978 | 9/31,905 | 1/11,429 | 0/ 4,156 | 1/ 5,606 | 11/53,096 | 0.02071 |
| 1979 | 3/10,960 | 0/ 9,351 | 0/ 676 | 0/ 6,383 | 3/27,370 | 0.01096 |
| 1980 | 0/13,312 | 2/22,140 | 0/ 236 | 0/ 8,041 | 2/43,729 | 0.00457 |
| 1981 | 4/15,525 | 0/16,720 | 0/ 2,182 | 1/10,688 | 5/45,115 | 0.01108 |
| 1982 | 1/ 8,863 | 0/ 8,504 | 0/ 2,251 | 0/ 9,710 | 1/29,328 | 0.00340 |
| 1983 | 0/13,304 | 2/34,169 | 6/19,148 | 0/11,441 | 8/78,062 | 0.01024 |
| 1984 | 2/14,524 | 2/28,520 | 0/ 9,675 | 1/16,014 | 5/68,733 | 0.00727 |
| 1985 | 1/12,599 | 0/12,140 | 1/11,845 | 0/12,071 | 2/48,655 | 0.00411 |
| 1986 | 1/10,604 | 2/19,204 | 1/ 3,735 | 0/13,588 | 4/47,133 | 0.00848 |
| Total | 28/178,165 | 9/202,001 | 8/67,005 | 4/116,615 | 49/563,786 | 0.00869 |
| CPUE | 0.01571 | 0.00445 | 0.01193 | 0.00343 | 0.00869 | |

[1]CPUE = Number of spearfish caught per 100 hours fished.

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