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State of South Carolina's Coastal Resources: Sheepshead

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INTRODUCTION

The sheepshead, *Archosargus probatocephalus*, is a member of the family Sparidae or porgies. This species is found along the east coast of the United States mainly from North Carolina south to the southern tip of Florida. It also occurs throughout the Gulf of Mexico and along the South American coast to Rio de Janeiro, Brazil. However, problems exist with the taxonomy of the form found along South America and on the mud bottoms of the Gulf of Mexico.

Sheepshead have a grayish color with five to six dark vertical bars (Figure 1) and a mouth full of well formed teeth used to pick prey items off hard substrates such as pilings and rocks. Recreational anglers frequently refer to sheepshead as “convict fish” because of both their unique coloration and ability to snatch a bait off a hook as if by magic.



Figure 1. The sheepshead, *Archosargus probatocephalus*.

THE FISHERY

As previously mentioned, sheepshead are important to recreational fishers who ply their sport in the coastal and estuarine waters of South Carolina. The average angler does not generally target this species. It has what you would almost consider a “cult” following. Those that pursue the “convict” fish may fish only for them and little else. If a red drum happens to jump on a fiddler crab or a shrimp, that’s fine – but the object of the trip is to catch sheepshead.

By far, the bulk of the recreational catch is made by small boat anglers fishing in inland (estuarine) waters (Tables 1 and 2).

Table 1. Total catch in numbers of sheepshead in the South Carolina recreational fishery by fishing mode; data pooled from 1981 through 2002; source NMFS.

Mode	Number (x 1,000)	Percent of Catch
Beach/bank	1.3	0.1
Man Made	17.2	0.8
Shore	62.4	2.8
Charter Boat	252.7	11.3
Private Boat	1,898.7	85.0

Table 2. Total catch in numbers of sheepshead in the South Carolina recreational fishery by area fished; data pooled from 1981 through 2002; source NMFS. The catch includes fish caught and harvested, fish caught and used for bait or discarded dead, and fish caught and released alive.

Area	Number (x1,000)	Percent of Catch
Ocean (<= 3na mi)	279.0	12.5
Ocean (> 3na mi)	270.9	12.1
Inland	1,682.0	75.4

Since 1981, the total recreational catch in numbers has fluctuated from a high of 380,000 in 1992 to a low of 14,000 in 1981 (Figure 2). The long-term average for the 22 years from 1981-2002 is about 100,000 fish per year. The source of these data is the MRFSS of the National Marine Fisheries Service. *Note: MRFSS = Marine Recreational Fisheries Statistical Survey.*

The precision of the estimate depends upon the sample size and the variability in the catches of a given species. When sample size is low, i.e., few interviews, and the catches from the intercepts are highly variable, the precision of the survey’s estimated catch is not very precise. This is the case for sheepshead.

The percentage of the catch made up of fish caught and released alive has shown an increase over time. Since 1994, the estimate has either equaled or exceeded the long-term mean of about 17% (Figure 3).

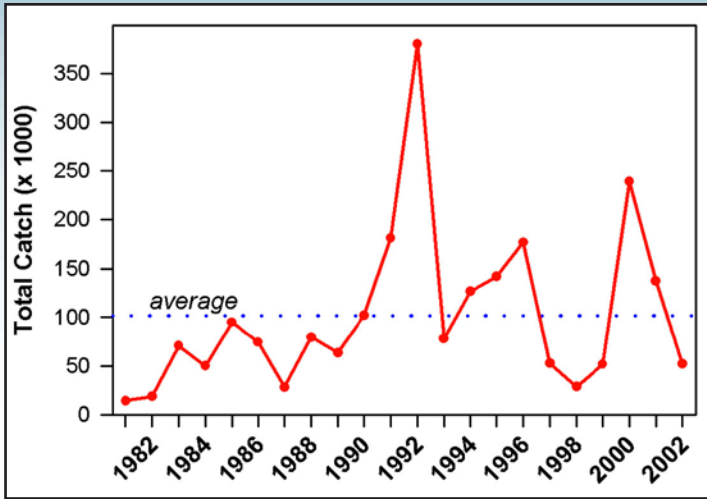


Figure 2. Estimated annual total catch in numbers of sheepshead in the recreational fishery in South Carolina; dotted line is the long-term mean.

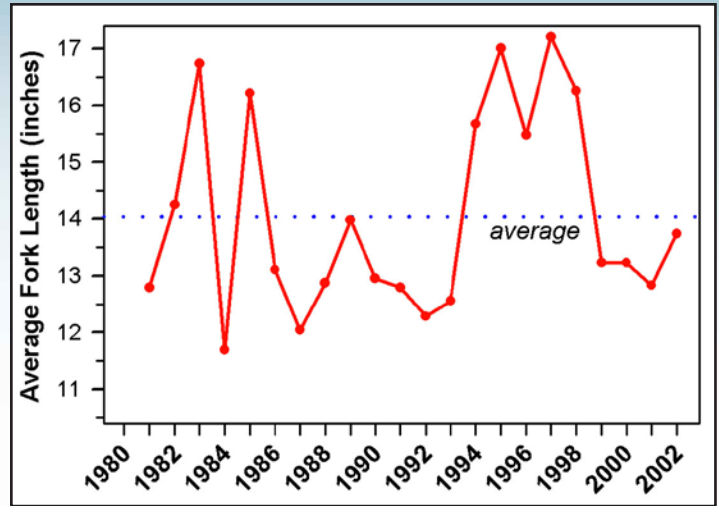


Figure 4. The average size of sheepshead in the recreational harvest by year. Source NMFS.

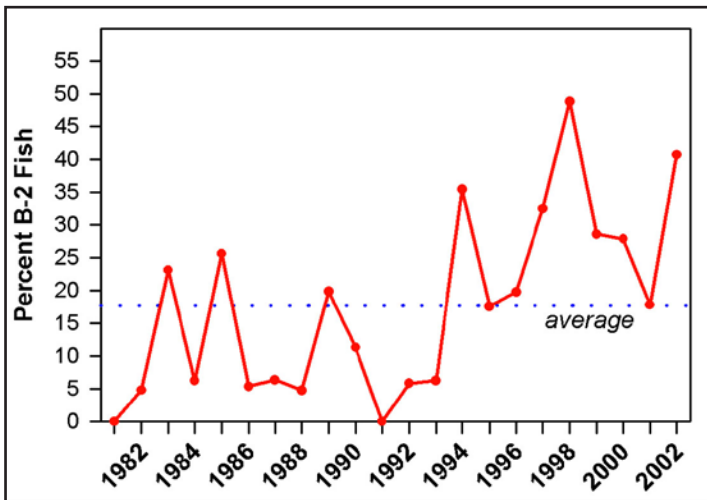


Figure 3. Annual estimates of the percentage of the recreational catch of sheepshead released alive; data source NMFS.

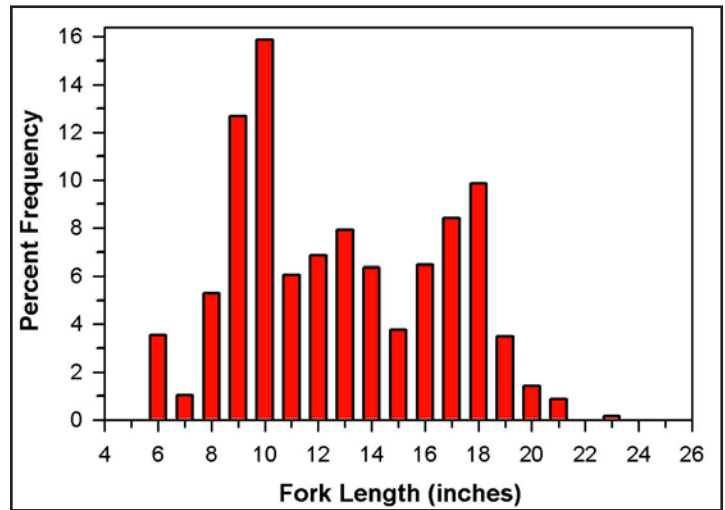


Figure 5. Sizes (fork length in inches) for sheepshead caught in the recreational fishery in SC from 1998 through 2002.

The average size of sheepshead measured in the recreational catch since 1981 is slightly greater than 14 inches fork length. In the most recent years for which data are available (1999 – 2002), the average has been lower than the 22 year average (Figure 4). In the five most recent years (1998 – 2002), over 65% of the fishes measured in the MRFSS by the creel clerks were 12 inches fork length or less (Figure 5).

The determination of the ages of the sheepshead landed in SC by anglers by the examination of ear-stones or otoliths showed that this species has a relatively long life. The oldest sheepshead that we have encountered to date was 26 years of age.

By calculating the average age of sheepshead at a given fork length, we can obtain an idea of the contribution of the various age groups to the catch. By plotting the fork length of the catch against their ages, a growth curve can be determined. The growth curve for sheepshead in South Carolina is shown in Figure 6. At the end of their first year, on average a sheepshead is about 10 inches FL. At about age 6, the growth rate declines and there is only a small increase in length with increasing age. This is a typical growth pattern for fishes. A period of initial rapid growth is followed by a slow increase in size with age. The point of diminished growth is frequently the age of attaining sexual maturity. Energy derived from food is directed more towards reproduction than increasing in size.

As fish increase in length, their weight tends to increase exponentially. For example, a sheepshead 10 inches FL

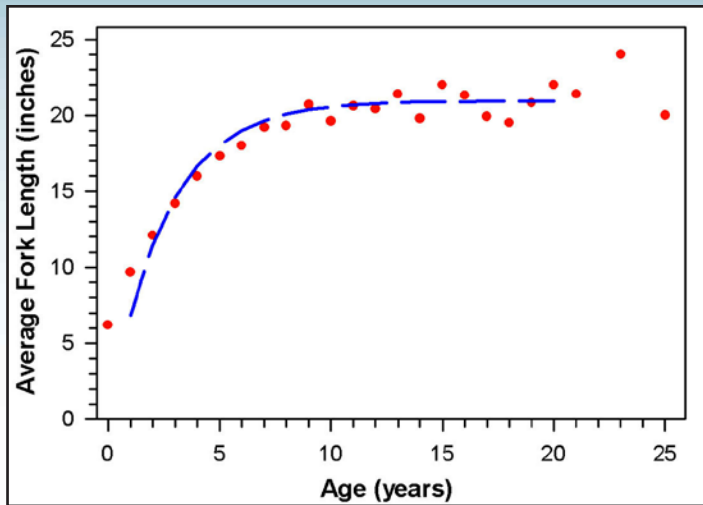


Figure 6. The relationship of mean fork length in inches and age for sheepshead in SC; age determined from the examination of sections of otoliths.

has an estimated weight of about one pound; a 20 inch long fish has a weight of about 8 pounds (Figure 7). A relatively small increase in length often results in quite a large increase in weight of the fish. This is because the fish is growing in length, width and depth and the relationship of length and weight does not take into consideration these other changes in the total size of the fish.

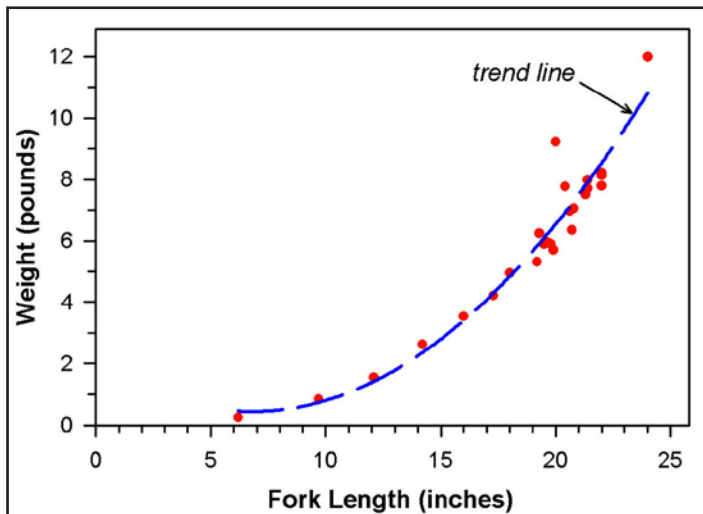


Figure 7. The relationship of the fork length in inches and the weight in pounds for sheepshead in SC.

Examination of the recreational harvest of sheepshead in South Carolina shows that over 38% of the fish caught during the last five years were 10-inches FL or less. These were mainly two-year old sheepshead with a weight of about 1 pound. If these individuals were allowed to live for an additional year, they would increase in length to about 15 inches FL and increase in weight to about 2 pounds.

Another aspect of the life history of sheepshead is its reproductive biology. Sheepshead spawn from late winter to early spring. Preliminary evidence suggests that they move offshore in the late fall when nearshore water temperatures cool below 10°C (50°F). The exact location is unknown; however, several tag returns from sheepshead tagged in the Cape Romain area have been returned by anglers who have caught them near the nearshore artificial reefs (Caper's Reef) during the winter. More anglers have become aware of the winter concentration of sheepshead on these structures.

A very important aspect of the reproductive biology of a fish species is the maturity schedule. This is the percentage of the members of fish species that becomes mature at a given length or age.

At 10 inches FL, approximately half of the sheepshead are immature; this species attains complete maturity, i.e., all of the members of the population are mature, at 14-in FL (Figure 8). This corresponds to an age of 3 to 5 years. For a long-lived species such as sheepshead, care should be exercised in the harvest of those individuals who have not reached the age of maturity. Sheepshead produce several batches of eggs during the course of the spawning season. Most mortality occurs between fertilization, settlement and the completion of the juvenile phase. For sheepshead, this is from 3 to 4 years.

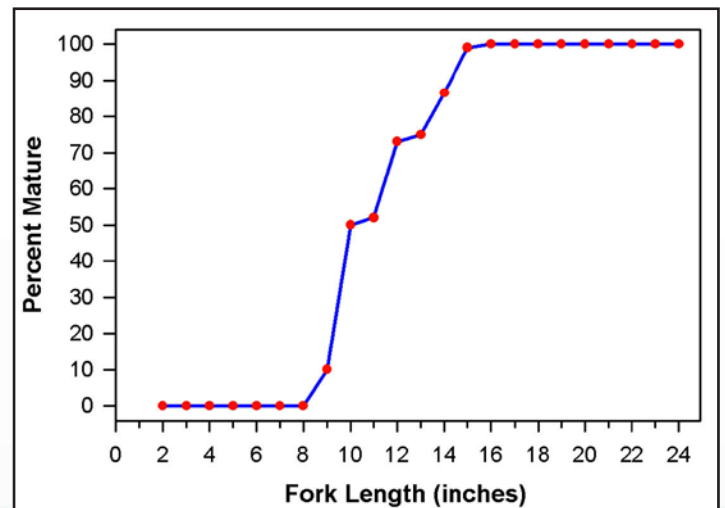


Figure 8. Maturity schedule (the percentage of the fish that are mature at a given size) for sheepshead in SC.

With the increase in the coastal population and the greater emphasis placed on the harvest of this species by the recreational fishing community, smaller fish will be harvested. Also, there has been an increase in the harvest of sheepshead in the winter months when they move offshore into warmer waters. They are found around the nearshore

artificial reefs as well as the nearshore “live bottom” areas off South Carolina’s coast. Anglers have discovered this and they are now being targeted more frequently by more fishers.



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