

Spot

Leiostomus xanthurus

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DESCRIPTION

Taxonomy and Basic Description

Spot is a common member of the family Sciaenidae that was first described by Lacepede (1802). Johnson (1978) provides the following description of morphology. The body of the spot is deep and compressed laterally; the back is strongly elevated; the head is obtuse and short with the small mouth positioned ventrally. Spot are bluish-gray above and somewhat golden below. They have 12 to 15 oblique dark streaks that may become indistinct in larger specimens. A single large black spot is located above the gill cover.

Status

Spot represent a significant link in the transfer of energy from the estuary to the waters of the adjacent continental shelf. Because of their abundance, they are considered to be ecologically important, influencing the structure and function of estuarine systems (Kjelson and Johnson 1976); as such, spot have the potential to act as an indicator species for estuarine systems. In addition, spot are important to both recreational and commercial anglers in the Mid-Atlantic Region where they comprise the major proportion of the biomass and numbers of fish present (Phillips et al. 1989).

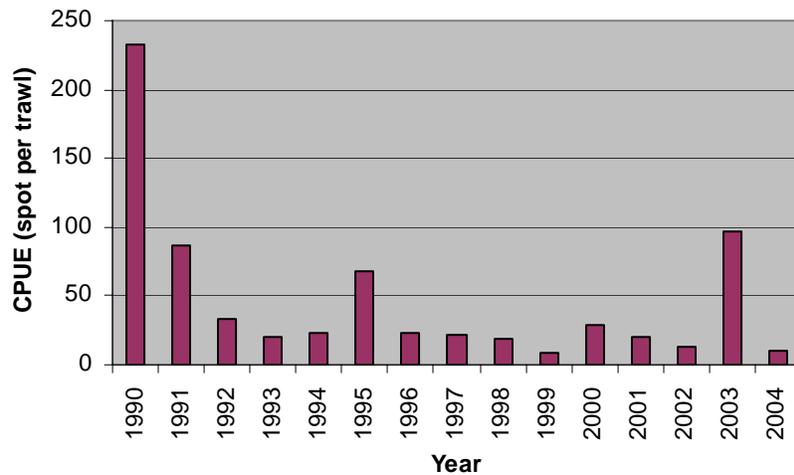
Spot support significant commercial harvests concentrated along the Atlantic coast of the United States from the Chesapeake Bay through the Carolinas (Phillips et al. 1989). In this region, they comprise a significant component of nearshore bottom trawl catch (by-catch) (Desfosse et al. 2001). In South Carolina, commercial landings were high and often exceeded those of Virginia and North Carolina during the early 1960s. However, over the last 20 years, commercial landings in South Carolina have diminished significantly, likely due to a shift in fishery effort. From 1980 through 2000 the largest commercial landings were reported from either North Carolina or Virginia (Desfosse et al. 2001).

Spot provide seasonal recreational fisheries in river estuaries and along beaches throughout most of its range. The number of spot harvested by the recreational fishermen along the Atlantic coast has declined steadily from the early 1980's until 1999 (Desfosse et al. 2001). In South Carolina, the median annual landings from 1990 through 2000 were 801,785 fish (range = 0.142 to 1.4 million).

POPULATION DISTRIBUTION AND SIZE

Spot are commonly found within estuarine and coastal waters from Cape Cod to the Bay of Campeche in Mexico (Phillips et al. 1989). In South Carolina they are found in estuaries throughout the state's coastline.

Although there are no population estimates, in South Carolina spot was the most numerically abundant species in the SEAMAP nearshore trawl survey from 1990 through 2004, contributing 17.63 percent of total species observed (J. Boylan, SCDNR, pers. comm., Jan. 2005). During that period, SEAMAP data show no obvious trend in abundance.



HABITAT AND NATURAL COMMUNITY REQUIREMENTS

Following entry to the estuary, spot associate with shallow habitats, particularly tidal creeks. Due to its high productivity, this habitat provides ample prey for spot, which feed mostly on small bottom dwelling worms and crustaceans (Chao and Musick 1977). The habitat is shallow and structurally complex, providing a physical refuge from predators. In addition, spot are well adapted to live in the physiologically stressful low dissolved oxygen, high carbon dioxide environment of small tidal creeks (Cochran 1994). Research in Rose Bay, North Carolina suggests that during their first summer, spot grow and disperse from shallow edges of the bay to all depths (Currin 1984).

While offshore, spot inhabit sandy or muddy bottoms in depths up to 60 meters (197 feet). Following spawning, larvae may take advantage of tidal mechanisms such as tidal bores and internal waves to migrate inshore (Williams 1993). Spot larvae are most dense in midwater and near the bottom during the day, and migrate into surface waters at night. Nearshore, they are most dense on the bottom both day and night, possibly utilizing the salt wedge to enter the estuary.

Spot are strongly associated with the bottom as juveniles and adults and are seasonally dependent on the estuary. Along the east coast of the United States, spawning takes place on the outer continental shelf from October through March. Peak spawning occurs during December and January off the North Carolina coast. As larvae mature, they are passively transported toward shore by currents (Warlen and Chester 1985). Near inlets, the larvae begin to metamorphose into juveniles (Phillips et al. 1989). In South Carolina, peak movement into the estuary occurs during late March (Williams 1993). Young-of-the-year spot typically move first into the upper reaches of the estuary and then disperse to the lower reaches as they mature through their first season. In South Carolina, tidal creeks are important nursery habitats for post larval and juvenile spot (Cochran 1994). Young-of-the-year may remain in the estuary during their first winter, while older fish migrate offshore to spawn.

CHALLENGES

Saltmarsh is among the most biologically productive ecosystems in the world. The marsh provides food, structure and refuge from predators; it also regulates the amount of freshwater, nutrient and sediment input into the estuary (SAFMC 1998). Small tidal creeks associated with marshes provide nursery areas and critical fisheries habitat for a variety of species (SAMFC 1998). Development of upland habitat adjacent to saltmarsh and the proposed development of hammock islands in South Carolina have reduced or have the potential to reduce the quality of saltmarsh habitats. Degradation of the saltmarsh ecosystem would risk negative impacts to the vast resources that depend upon it, including spot.

Recent research suggests that chemical pollution may have serious impacts on maturation of spot adults (Thomas 1990) and survival and development of larvae (McCarthy et al. 2003).

CONSERVATION ACCOMPLISHMENTS

Actions by the South Atlantic Fishery Management Council (SAFMC) led to the mandatory use of bycatch reduction devices (BRD) in shrimp trawl nets. Studies have shown that BRD are effective at reducing mortality of fish such as spot. Also, since 1986 shrimp fishing in South Carolina is not allowed in the bays and sounds, thereby reducing exposure to trawls.

CONSERVATION RECOMMENDATIONS

- Develop a valid measure of spot abundance and identify factors affecting that abundance and recruitment.
- Investigate effects of chemical pollutants on spot populations and abundance.
- Monitor long-term changes in spot catch and effort statistics from the commercial and recreational fisheries to determine population trends.
- Protect water quality and important estuary habitat by working with municipalities to include BMPs in soil and water conservation plans. Such plans should include installation of retention ponds, modified septic systems, and stream bank protection measures.
- Promote yield per recruit by delaying entry to spot fisheries to age one and older fish (Desfosse 2001).

MEASURES OF SUCCESS

The measurement of success will be healthy estuarine habitat and a stable or increasing population trend for spot.

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