

Species Profile – Scup (*Stenotomus chrysops*)

Species range and distribution

Primarily Massachusetts to South Carolina, but reported as far north as the Bay of Fundy and Sable Island, Nova Scotia and south as far as Florida (Steimle *et al.* 1999).

Habitat characteristics and habitat use by life stage

Eggs and larvae: Eggs and larvae are pelagic and commonly found in the upper water column. Owing to their inshore distribution, very few scup eggs or larvae were collected in the NEFSC MARMAP ichthyoplankton survey. After reaching 15-30 mm TL in early July, the larvae become demersal in shoal waters (Lux and Nichy 1971; Johnson 1978; MAFMC 1996; Able and Fahay 1998). Griswold and McKenney (1984) considered the larvae as juveniles when they grow to about 18-19 mm TL. There is no information available on habitat use or requirements during this transition period.

Juveniles (<16 cm FL): Able and Fahay (2010) noted that the smallest, young-of-the-year (YOY) individuals appeared in Mid-Atlantic estuaries in June and reach 3-15 cm TL by October. During warmer months, juvenile scup live inshore in a variety of coastal habitats and can dominate the overall fish population in most larger estuarine areas during that time of year. There is little information available regarding specific habitats favored by juvenile scup. In the Great Bay-Little Egg Harbor estuary in New Jersey, they occur over a variety of substrates, but are most abundant over unstructured bottom and in depths ranging from 3 to 5 m (Able and Fahay 2010). They have also been collected in Long Island Sound and the coastal bays of Delaware (Gottschall *et al.* 2000, Richards 1963, Derickson and Price 1973). Little is known about specific offshore habitats occupied in winter. The presence of structure can be important to scup. Gray (1990) and Auster *et al.* (1991, 1995) noted that juveniles use biogenic depressions in the sediments off southern New England in the fall; Juveniles can use biogenic depressions, sand wave troughs, and possibly mollusk shell fields for shelter in winter. As they migrate offshore in the winter, juvenile scup leave shallower, warmer bottom waters to occupy deeper, colder waters. Juveniles collected in the fall NEFSC trawl survey (1963-1997) were most commonly caught at depths of 10-20 m and water temperatures of 16-24°C; they were found primarily in the spring in depths of 70-90 m and temperatures of 8-15°C (Steimle *et al.* 1999).

Adults: Habitats are similar to those used by juveniles and include soft, sandy bottoms, on or near structures such as rocky ledges, wrecks, artificial reefs, and mussel beds in euryhaline areas (Briggs 1975a; Eklund 1988; MAFMC 1996). In Long Island Sound, scup exhibit a strong preference for mixed sand and mud sediments (Gottschall *et al.* 2000). Winter habitats or habitats used during seasonal migrations are not well understood. Adults collected in the fall NEFSC trawl survey (1963-1997) were most commonly caught at about the same depth and water temperatures as juveniles (10 m and 17-27°C); catches in the spring occurred in two modes, one at 30 m and another at 80-130 m with a third isolated peak at 170 m. Bottom water temperatures were primarily 9-17°C.

Migrations

Juveniles follow adults migrating offshore to warmer waters on the mid to outer shelf south of Long Island in depths of 75-185 m in winter as bottom water temperatures drop below 8-9°C (Morse 1978; Bowman *et al.* 1987). Some remain in larger and deeper estuaries during warmer winters. As inshore temperatures rise in spring rise above 7°C, scup return to coastal waters. Larger fish arrive first. Scup are reported to school by size (Neville and Talbot 1964; Sisson 1974; Morse 1978).

Food habits

In Long Island Sound, juveniles feed principally on polychaetes, epibenthic amphipods and other small crustaceans, mollusks, fish eggs and larvae (Bowman *et al.* 1987). Copepods and mysids are important prey for early juveniles (Richards 1963b; Bowman *et al.* 1987; Michelman 1988). Amphipods, polychaetes, copepods, and other small crustaceans are eaten by juveniles in New Jersey (Allen *et al.* 1978). Juveniles and adults ate a mix of hard-surface epifauna and sand bottom infaunal prey near an artificial reef in Delaware Bay (F. Steimle, unpublished data). Adults are also benthic feeders on a variety of prey, including small crustaceans, polychaetes, mollusks, small squid, detritus, insect larvae, hydroids, sand dollars, and small fish (Bigelow and Schroeder 1953; Oviatt and Nixon 1973; Maurer and Bowman 1975; Morse 1978; Sedberry 1983). As scup grow, they feed on larger prey.

Reproduction and maturity

Sexual maturity is reached at age 2 (Finkelstein 1969; Morse 1982). Scup spawn once a year along the inner continental shelf beginning in the spring during the inshore migration (Kendall 1973) when water temperatures are $>10^{\circ}\text{C}$ and lasting from May to August with a peak in June (Able and Fahay 2010). Most spawning occurs in southern New England from Massachusetts Bay south to the New York Bight, including eastern Long Island Sound, Peconic and Gardiners Bays, and Raritan Bay (Bigelow and Schroeder 1953; Wheatland 1956; Richards 1959; Finkelstein 1969; Sisson 1974; Morse 1978; Clayton *et al.* 1978). Kendall (1973) noted the occurrence of larvae in estuaries from Delaware Bay to Buzzards Bay. Stone *et al.* (1994) reported scup larvae in the same inshore areas as eggs; i.e., from southern Cape Cod to Long Island Sound and in the Hudson-Raritan estuary. Despite these reports, Able and Fahay (1998) noted that like the eggs there has been no verified collection of scup larvae in southern New England estuaries since Sisson (1974). This is surprising since some of these areas; e.g., Delaware Bay, are important juvenile nurseries (de Sylva *et al.* 1962). Spawning presumably does not take place over the continental shelf since only 14 larvae were collected in the 11 years of the MARMAP survey (Able and Fahay 2010). Spawning has not been reported south of New Jersey (Morse 1982). It has been suggested that scup spawn over sandy and weed-covered bottoms (Morse 1978).

For the 2015 stock assessment of scup (NEFSC 2015), available maturity at age data from the NEFSC spring trawl survey for 1981-2013 (34 years) have been examined. The current data set consists of 1,472 males from age 1 to 10 and 1,828 females from age 1 to 11, for a total of 3,300 fish. The median length at maturity (50th percentile, L50) was estimated at 15.6 cm (95% CI from 13.5 to 18.0 cm) for males, 16.3 cm (95% CI from 14.0 to 18.6 cm) for females, close to the Finkelstein (1969), Morse (1978), and O'Brien *et al.* (1993).

Stock structure and status

Scup is presently considered a single stock in the Middle Atlantic Bight (Pierce 1981; Mayo 1982). The stock is not overfished and overfishing is not occurring based on the most recent stock assessment (2021). For current details on stock status: <https://www.fisheries.noaa.gov/national/status-stocks-reports>

Fishery

Scup are highly sought after by commercial and recreational fishermen throughout Southern New England and the Mid-Atlantic. The scup stock supports commercial fisheries from Massachusetts to North Carolina. The recreational fishery for scup is significant, with anglers accounting for 17 to 67% of total annual catches from 1981-2017 with the majority of the harvest coming from Massachusetts, New York, New Jersey, Rhode Island, and Connecticut. The scup fishery predominantly uses trawls or handlines, but other gear includes longline, rod and reel, pot, trap, gillnet, spear, and dredge.

Management

The management unit for scup is U.S. waters in the western Atlantic Ocean from Cape Hatteras, North Carolina northward to the U.S.-Canadian border. The species is managed jointly by the Mid-Atlantic Fisheries Management Council and the Atlantic States Marine Fisheries Commission. The fishery is managed using minimum size, season, and a bag limit for the recreational fishery; and a coastwide seasonal quota, size limit, seasonal possession limits, and gear restrictions for the commercial fishery.

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