# Brief Squid

*Lolliguncula brevis*

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DESCRIPTION

## Taxonomy and Basic Description

The brief squid was first identified by Blainville (1823) from specimens collected in Brazil. The scientific name was changed twice before Steenstrup (1881) returned the species to its original *Lolliguncula brevis*. This squid is relatively small, rarely exceeding 120 mm (4.7 inches) in mantle length; the standard measure of size is body without head and arms. Having rounded fins, the body is less streamlined than most oceanic squids. The brief squid is unique among cephalopods because it is an osmoconformer; that is, its body salinity matches ambient water salinity. Further, this species is capable of tolerating salinities as low as 8.5 ppt (parts per thousand), although it is more common in higher salinities (Hendrix et al. 1981; Laughlin and Livingston 1982).

Ogburn-Mathews and Allen (1993) found the brief squid to be the third most numerous component of trawl and seine samples collected in North Inlet, South Carolina. However, these researchers only found the species in estuarine waters from April through December. Squid were consistently collected together with bay anchovies, perhaps indicating a predator/prey relationship between the two species.

Brief squid are relatively common in the nektonic community (water column) and make up a considerable portion of the estuarine biomass. Accordingly, the species is assumed to be important prey for carnivorous fishes, particularly given the popularity of squid as fish bait. Squid are also known to be cannibalistic, with adults feeding on juveniles (Whitaker 1978). As the squid increases in size, its prey preferences change. Small squid feed on benthic crustaceans and possibly small fish or fish larvae, whereas larger squid often feed on small fish, probably schooling species such as anchovies and silversides. In confinement, the species survives well on grass shrimp (*Palaemonetes* spp.) and small fishes such as killifishes (*Fundulus* spp.), livebearers (Poecillidae) and sheepshead minnow (*Cyprinodon variegatus*) (Hanlon *et al* 1983.)

## Status

As a common component of the nearshore and estuarine nektonic community of South Carolina, this species represents a considerable portion of the estuarine biomass and probably occupies a critical role in the estuarine food web. It is considered an indicator species for the health of this community type.

POPULATION DISTRIBUTION AND SIZE

The geographic range of this species is from Maryland through Rio de la Plata, Argentina (Voss 1956). The species is common throughout the coastal waters of South Carolina, with all age

classes, from small juveniles to adults, having been collected in trawl samples throughout the coastal zone. Because the species has planktonic juvenile stages, there is presumably a single population distributed along the South Carolina coast; however, this has not been specifically investigated. Unfortunately, there are inadequate long-term data sets to evaluate the population size and no long-term survey exists that can be used to assess population trends. Anecdotal information suggests the species has not declined significantly in abundance since the 1950s when the first scientific trawl samples were consistently taken.

## HABITAT AND NATURAL COMMUNITY REQUIREMENTS

Squid are most commonly found in salinities in excess of 17 ppt and are generally confined to the lower portions of estuaries where salinities are relatively high. No specific critical habitats have been established for the brief squid. The species is thought to be largely a nektonic inhabitant, although it seems to be associated more with bottom waters than with surface waters. Vecchione (1991) found catch rates of the squid's paralarvae (a planktonic form that is anatomically identical to the adult) to be higher in bottom samples compared to samples taken in the upper portion of the water column. Ogburn-Mathews and Allen (1993) found the species to be more abundant over mud bottoms versus sand bottoms within inlets. Bartol et al. (2002) noted that in Chesapeake Bay, the brief squid was more common in central channel depths of 10 to 15m (33 to 49 feet) than in deeper waters.

Precise information on spawning locations is unknown. However, egg strings have been found in trawl samples taken in Charleston Harbor (pers. obs.). Cephaolopds typically attach egg strings to solid objects such as oyster shells, clam shells or other bare, solid objects. Egg strings have been observed on shallow mud flats in South Carolina, presumably attached to molluscan shells (M. Maddox, SCDNR, pers. comm., 18 March 1980).

## CHALLENGES

Although the brief squid is relatively common in trawl and seine samples collected in South Carolina, there is no estimate of population size or trend. Additionally, the factors that may negatively affect brief squid populations and basic aspects of its life history are still unknown. Due to the prevalence of brief squid in the marine environment, it is an excellent indicator of the health of that environment.

Shrimp trawlers occasionally catch brief squid (pers. obs.); however, they are not likely captured in quantities that would threaten the sustainability of the species. The vast majority of squid utilized as bait and food in South Carolina is of the genus *Loligo* because it is larger in size and of a preferred texture; it s imported from California. Reported commercial landings of *L. brevis* in South Carolina have averaged less than a thousand pounds per year, probably all bycatch from the shrimp trawl fishery. The species has been part of the shrimp fishery bycatch for over fifty years and there appears to be no negative impacts upon the population due to trawling; however, population trends have not been specifically monitored (N. Jenkins, DNR Fisheries Statistics Program, pers. comm., 21 March 2005).

Brief squid probably rely on relatively clean water and appear to be linked to mud bottom habitats that are common in South Carolina. Hard structures for attachment of egg strings are important for the species and oyster and clam shell is abundant on estuarine bottoms. Reductions or alterations in river flow rates through out-of-basin transfers or diversions may negatively impact the brief squid. Presuming the species is estuarine-dependent, adequate quantities of fresh water flowing into estuaries may be necessary to maintain viable populations; although the species is common in North Inlet, which is a small system with very little freshwater inflow. Pollutants associated with terrestrial runoff are likely to be problematic for brief squid populations.

Additionally, substantial alteration to intertidal and subtidal mud flats, particularly resulting in siltation covering shell and hard structure could reduce optimal substrate for egg string attachment.

## CONSERVATION ACCOMPLISHMENTS

In the 1950s, South Carolina closed most estuarine waters to shrimp trawling. Additionally, the state's sounds and bays, which were periodically opened on a limited basis, were permanently closed to trawling in 1986. Shrimp trawling is known to produce bycatch of brief squid; therefore these closures may have contributed to some level of conservation of stocks. The state has also prohibited the use of small mesh gill nets and "stop nets" (nylon mesh nets used to entrap fish) in most estuarine waters. It is presumed that these gear types could have contributed to mortality of brief squid when they were in use.

## CONSERVATION RECOMMENDATIONS

- Examine long-term trends in brief squid population size and relate those trends to environmental and other factors such as predator/prey relationships.
- Determine spawning seasons, spawning locations and recruitment mechanisms for brief squid.
- Determine brief squid predator/prey relationships.
- Determine effects of pollutants on distribution, reproduction, growth, maturation, and longevity of brief squid.
- The DNR and other resource management agencies should examine regional water use plans to assure that adequate quantities of water are provided to coastal estuaries during the appropriate seasons.
- Work with municipalities and counties to include Best Management Practices (BMPs) in development plans throughout the coastal zone. Such plans should include installation of retention ponds, modified septic systems and stream bank protection measures. Poorly designed, existing storm water systems should be retrofitted to updated designs.

## MEASURES OF SUCCESS

Once threats and conservation actions are better identified through the above-mentioned survey and research needs, a management plan for brief squid can be developed. This plan would

represent a measure of success for this species. Further, improved water quality will benefit many sensitive marine species.

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