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SHARKS IN THE ST.LUCIA LAKE SYSTEM

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1. Species found in the system. The shark fauna of the St. Lucia system is dominated by one species, the zambezi or bull shark (Carcharhinus leucas). This large predaceous shark is born at 60 to 70cm, matures at about 225cm and attains a maximum length of 300cm. It is the only species found throughout the system, the others being confined to the mouth and its immediate vicinity. These include Odontaspis taurus, Carcharhinus limbatus and Rhizoprionodon acutus. The last-named is a small species attaining no more than 100cm in length. It occasionally ventures into brackish water but is usually confined to shallow inshore areas. As in the case of C.limbatus and O. taurus, movements of this shark into estuaries are restricted to following sea-water pushing in with an incoming tide. O. taurus and C. limbatus are both large animals attaining maximum lengths of about 300 and 270cm respectively. Specimens are frequently taken by anglers fishing in the St.Lucia mouth and on the nearby beaches where a number of other shark species are also taken.

2. Life-history of C.leucas. The basic distribution of C.leucas along the east coast of Africa is tropical, the adults being found in shallow warm waters as far south as Durban. A few specimens may range further south on occasion but are certainly not common off southern Natal or the eastern Cape. The adults are found almost exclusively in marine waters with mating taking place in areas to the north of St.Lucia. When the

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pregnant females reach full-term they swim to one or another estuary and give birth within a few hundred metres of the sea. Litters average about twelve in number. The young sharks spend most of their time in fresh or brackish water but also venture out to sea at times. By the time they reach adulthood they have moved permanently into the sea. It should be noted that growth in sharks is a slow process and that C. leucas may take twenty or more years to reach maturity. Young sharks may thus spend many years in a given freshwater body.

A further point is that other populations of C. leucas, found in tropical waters throughout the world, may differ in their natural history. In Lake Nicaragua C. leucas attains a smaller size than in our population, and adults definitely occur in the lake although it is not known whether breeding takes place here or in the sea (see Thorson 1971, Thorson et al 1966).

3. Distribution in Lake St. Lucia. Most of our records of C. leucas in the St. Lucia system were made during periods of high salinity in 1967 and 1969 and may therefore differ considerably from the distribution during periods of low salinity. However, C. leucas definitely occurs in fresh water along the east African coast and has been found in most of the rivers of northern Natal. Netting showed that sharks occurred regularly in salinities of up to 47⁰/oo but only one was taken in water of 53⁰/oo and none in higher salinities. The size distribution of C. leucas in St. Lucia and in the sea off central Natal is shown in figure 1.

It can be seen that the youngest sharks are chiefly found in the Narrows while older specimens spend most of their time in the main lakes. The size range from 90 to 120cm is rare in the system, the young apparently spending this period in the sea. A similar phenomenon is apparent in

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Lake Nicaragua (T.B. Thorson, pers. comm.). Sexual segregation is also apparent among the juveniles in St. Lucia. "Among the young sharks (less than 90cm) in the estuary and Narrows....there is a preponderance of maleswhile the larger (over 100cm) sharks caught in the same area are predominantly female" (Bass et al 1973). In the main lakes there is a predominance of males among the larger sharks. So few sharks under 100cm have been caught in this part of the system that no statement can be made about their sexual segregation. We can summarise the size and sex distribution as follows (after table 29 of Bass et al 1973):

St. Lucia - narrows and estuary	Mainly juveniles (predominantly males) with a few adolescents (predominantly females) and, near the estuary mouth, occasional adult females.
St. Lucia - main lakes	Mainly adolescents (a slight excess of males) with a few juveniles. No adults.
Natal coast	Mainly adolescents (equal numbers of each sex) with a fair proportion of adults (mainly females) and a very few juveniles.

Tagging of sharks showed that movement up and down the Narrows and between the main lakes and estuary takes place regularly. Several specimens were recaptured after moving from one end of the system to the other. One shark was caught in the surf near the estuary 36 days after being tagged at Charters Creek. Another was tagged in the southern main lake, recaptured four days later near the estuary, and then caught yet again 23 days later in the main lake. The longest times between tagging and recovery of sharks were 537, about 525, 366, 357 and 324 days.

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4. Feeding habits. C. leucas is best described as a scavenging predator. Most of the sharks taken in St. Lucia during our studies in 1968 and 1969 were in notably poor condition, possibly as a result of stress caused by high salinities. Nevertheless, a fair number of stomach contents were obtained as summarised here (after tables 30 and 31 of Bass et al 1973):

Teleost	89%	Including <u>Mugilidae</u> (17), <u>Pomadasys</u> spp. (8), eels (5), <u>Rhabdosargus sarba</u> (2), <u>Acanthopagrus berda</u> (2), soles (2), <u>Johnius hololepidotus</u> (2), <u>Thrissocles malabaricus</u> (1) and <u>Lutianus argentimaculatus</u> (1).
Elasmobranch	3%	<u>Dasyatidae</u>
Mammalian	3%	Including <u>Tragelaphus scriptus</u> (1).
Crustacean	6%	Including <u>Penaeus</u> spp. (5) and <u>Scylla serrata</u> (1).
Odd items	9%	Inorganic matter and unidentified materials.

It is obvious that the population of C. leucas must have a significant effect on the teleost population of the St. Lucia system. Unfortunately, we do not yet have sufficient data to put this onto a quantitative basis. The most important need at present is for studies on the sharks of this system during a period when the lakes are full of fresh or brack rather than hypersaline water.

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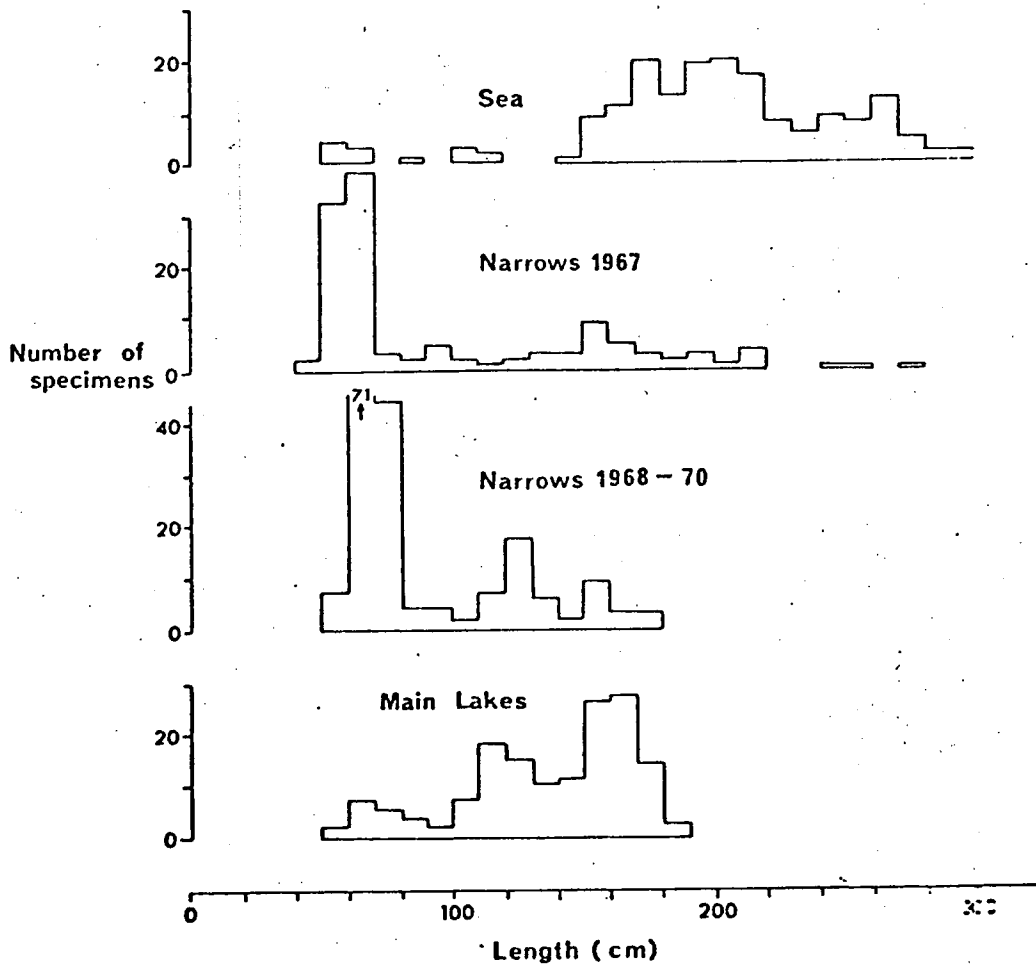


Figure 1. Distribution of C.leucas in St.Lucia (after fig.15 of Bass et al 1973).