Bronze whalers – solving the puzzle

■ **Hannes Holtzhausen tags and measures a bronze whaler shark prior to its release. Almost all bronze whaler sharks that are caught by Namibian shore anglers are released.**

Satellite technology is helping scientists learn about the migratory behaviour of the bronze whaler shark (Carcharhinus brachyurus), a species that is highly prized by anglers but which faces increasing threats from longline fishing.

The bronze whaler shark, which is known in South Africa and Namibia as the copper shark or "bronzy", is a common coastal species that is found throughout the world. It is one of the slowest growing of all shark species, making it extremely vulnerable to over-exploitation.

Scientists believe that two separate populations of bronze whaler sharks occur in southern Africa: one is distributed from the Western Cape eastwards and the other from Walvis Bay in Namibia, northwards into southern Angola. Tag and release studies suggest that Namibia and Angola share a single population of bronze whaler sharks.

Two sharks that were tagged at Baia dos Tigres in southern Angola in 2003, were recaptured three months later near Swakopmund in Namibia, 715km to the south.

Baia dos Tigres is thought to be an important breeding ground and nursery area for the sharks, but scientists believe that the species migrates to Namibian waters to bear its pups. This theory is supported by the fact that many of the sharks that are caught and tagged in Namibia are pregnant females.

The exact location of the species' pupping grounds remains a mystery, and this is one of the secrets that scientists hope to reveal when four satellite tags which have been attached to bronze whaler sharks are retrieved later this year.

The satellite telemetry project has the support of the Benguela Current Large Marine Ecosystem (BCLME) Programme, a regional initiative which is designed to improve the capacities of Angola, Namibia and South Africa to deal with environmental problems that occur across national boundaries.

Transboundary problems include the migration or "straddling" of valuable fish stocks across national boundaries; the bronze whaler shark presents a classic example of the difficulties associated with managing such stocks.

Tourism potential

In Namibia, bronze whaler sharks are one of the focal points of a vibrant tourism industry. Shore anglers prize the bronze whaler for its legendary fighting ability and anglers from all over the world travel to Namibia in the hope of catching a bronze whaler from the beach, using rod and reel.

Dr Hannes Holtzhausen, the head of research into large pelagic fish at the National Marine Research and Information Centre (NATMIRC) in Namibia, estimates that the recreational fishery for bronze whaler sharks generates R15 million in tourism revenue annually. Almost all of the bronze whaler sharks that are caught by anglers in Namibia are released.

In southern and central Angola however, bronze whalers and other pelagic shark species, such as thresher, blue, shortfin mako and soupfin sharks are harvested by pelagic longliners for their meat and fins. During 2001 and 2002, a targeted fishery for bronze whaler sharks developed in southern Angola, specifically at Baia dos Tigres. The exact levels of harvesting and the impact of this fishery are unknown, but scientists and the tourism industry in Namibia are concerned that it will have a devastating effect on the recreational fishery for bronze whaler sharks.

Determining migration patterns

One of the aims of the satellite telemetry project is to determine the extent to which bronze whaler sharks migrate seasonally between Namibia and Angola. The project will also test whether bronze whaler sharks may be sustainably harvested in southern Angola and what impact this harvesting is having on Namibia's recreational fishery.

"We hope to be able to assess the population and formulate a joint management plan for bronze whaler sharks so that the Namibian fishery can survive," says Holtzhausen.

Satellite tags have already been attached to a 140kg female bronze whaler shark that was caught at Langstrand in Namibia on February 7. A second shark, a large male, was tagged at Sandwich Harbour, south of Walvis Bay in the same month. Two other satellite tags were fitted to a large female and male shark in March.

The Argos PTT-100 archival pop-up tags are programmed to detach themselves from the sharks at year-end. The "pop off" date is scheduled to coincide with Namibia's holiday season in the hope that the tags will be found by shore anglers and returned to NATMIRC. Once the tags pop off the sharks, information about the sharks' migration route is automatically downloaded, via satellite, to an internet site, thereby offering scientists a window onto the world of these fascinating creatures.

Over the past two years, a total of 952 bronze whaler sharks have been tagged with

regular dart tags. During all these surveys, the exact location of the shark's capture is noted and measurements and genetic samples are taken. Biological data has been collected for 261 specimens and to date, 17 tagged sharks have been recaptured. The generated data is helping scientists to gather information about the size distribution and sex ratios of bronze whaler sharks and to identify seasonal changes in catch rates.

It is hoped that the numbers of pregnant females and new born sharks that are caught in these surveys will help to identify breeding and pupping areas so that these areas might be afforded protection in the future.

Fisheries model to be developed

Once all the necessary biological parameters and catch data have been collected, an appropriate fisheries model will be used to assess the bronze whaler stock in Namibia and Angola. Based on the results of this exercise, it should be possible to recommend a harvesting level for the resource as a whole. Such recommendations would take into account the need to have a sustainable commercial harvest in Angola without affecting the non-consumptive use of bronze whaler sharks in Namibia.

Also included in the BCLME-funded study is a genetic research component which will help to determine the stock identity of the bronze whaler resource in the BCLME region (from Port Elizabeth to the Congo River). This should reveal whether the South African population of bronze whaler sharks is indeed separate from the Namibian/Angolan population and will assist scientists to verify the information that is gathered in tag and release studies.

The BCLME-funded project will also include an economic survey which will quantify the value of the bronze whaler resource in Namibia, where the shark is an asset to tourism, and in Angola where the bronze whaler is exploited commercially.

At the close of the project, a plan for the future management of the shared bronze whaler stock will be presented to the governments of Namibia and Angola.

Fishing briefs...

■ The number of people **watching whales** worldwide increased from four million to nine million between 1991 and 1998 and it is estimated that tourists spent a total of $299.5 million on whale tours in 1998. These were some of the facts to emerge from the International Whale Watching Workshop that took place in Cape Town in March. The workshop highlighted the socio-economic benefits of sustainable eco-tourism, and in particular whale watching. It demonstrated that whale watching is much more profitable and sustainable than killing whales and that if properly organised, regulated and managed, it can provide financial and other benefits to local people.