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MICHAEL SCHOLL; RAMÓN BONFIL (BELOW); MARINE AND COASTAL MANAGEMENT (RIGHT)

Spying on Great White Sharks

TO BETTER PROTECT THEM BY RAMÓN BONFIL

THE RHYTHMIC rocking of the 21-foot boat and the warmth of the sun are putting us to sleep as we wait patiently in Gansbaai, off the superb Western Cape coast of South Africa. Suddenly, the cry of “Shark at 12 o’clock!” rings out from the observation tower, and we spring to our feet. It’s all action and excitement as the skipper of the *Lammidae*, Michael Scholl, a postgraduate student from the University of Cape Town and collaborator on our project, hauls in the rope with the bait, and we try to catch a glimpse of the great white shark that has responded to our chum.

The behavior of this 12-foot fish is very different from the distorted image most people have of great white sharks, inspired by sensationalistic films and pseudo-scientific TV documentaries. No rush to attack and devour, no thrashing around or displays of pure aggression, no hugely



gaping mouth showing lots of sharp teeth. This shark swims calmly and cautiously toward the bait and slowly circles it several times to investigate, while keeping an eye on the humans leaning over the side.

Gansbaai is perhaps the foremost spot on Earth for sighting great white sharks because of their abundance and proximity to the shore. During this April trip, we’re here hoping to tag several of them with

the most modern scientific instruments available for long-distance tracking of fish: pop-up archival transmitting tags (PAT tags). These tags allow us to follow the vertical and horizontal movements of aquatic animals in a way that only ten years ago was just a dream.

Once we’ve attached a PAT tag to this shark, the microchip will store information every 60 seconds for up to 12 months on the depths, temperatures, and light levels of the water where the shark swims. Then, at a programmed date and time, the tag will break free from its tether and float to the surface, where it will transmit the data through the Argos satellite system directly to my personal computer. With all this information, we can learn a great deal about each shark’s daily movements.

As Michael manipulates the bait to lure the shark close enough to be tagged, I prepare my hand-spear and turn on the

PAT tag. I take aim and shoot, inserting the dart that anchors the tag into the shark's back, just below its dorsal fin. Success! We've tagged our first great white shark of the 2003 season.

By the end of two weeks my colleague Stephan Swanson and I have reached our goal: ten great white sharks (four males and six females) are swimming the seven seas with our PAT tags. Stephan and Mike Meyer, our fourth team member, work for the South African government's Marine and Coastal Management Branch, WCS's main partner in this research effort to learn more about great white sharks and the threats to their conservation.

Ranging throughout all oceans, great whites are classified as *vulnerable* by IUCN-The World Conservation Union. Their numbers have declined in the last 30 to 50 years due to several factors: accidental by-catch in the fishing operations of many fleets, especially those looking for valuable tunas and bill fishes; a surge in trophy sport fishing inspired by the *Jaws* books and films; and accidental death in the gill nets strung up to keep beaches safe for swimmers and surfers. Due to overharvesting, a decline in the white shark's natural prey—mainly bony fishes, other sharks, and marine mammals—may also be a contributing factor.

Because great white sharks grow and reproduce slowly, their recent decline puts them at risk of extinction unless they are protected throughout their range. We need to find out more about their migrations and movements, and how they utilize the South African coast, in order to evaluate whether the protection they receive in these waters is working. In 1991, South Africa became the first country to legally protect white sharks in its 200-mile Economic Exclusive Zone. Namibia, Australia, the United States, and Malta have followed suit with similar legislation. We also hope to convince the international community to list great white sharks under CITES (the Convention on International Trade in Endangered Species).

The work we accomplished in April was relatively easy compared with what

we set out to achieve in June. Our goal on the second trip was to capture white sharks and fasten near-real-time satellite tracking devices to their dorsal fins. These tags would reveal the precise location of a shark every time its fin broke the surface of the water. To do this, we designed and custom-made a cradle to gently lift the sharks out of the water and restrain their movements while we worked carefully to avoid injuring them—or us.

We set out on a 150-foot South African research vessel with a larger team that included a veterinarian. We wanted to take all necessary measures to make sure that the sharks we captured and tagged were safe and healthy when we returned them to the sea.

The June field trip was a great success. We managed to equip four sharks with near-real-time satellite tags and we have been following their movements for up to six months or more; we still occasionally hear from one of these sharks. If we can raise enough funds, we hope to deploy 20 PAT tags and 20 near-real-time satellite tags on great white sharks in South Africa by the end of 2004.

Great goals and expectations, all for the sake of a great fish!

Ramón Bonfil has been studying sharks for 20 years. He launched the WCS Marine Conservation program's great white shark project in 2002. For more information, log on to www.wcs.org/greatwhitesharks.



The author (right, in sunglasses) and his team capture a great white shark (left, top) and attach a near-real-time satellite tag on its dorsal fin (left, inset).