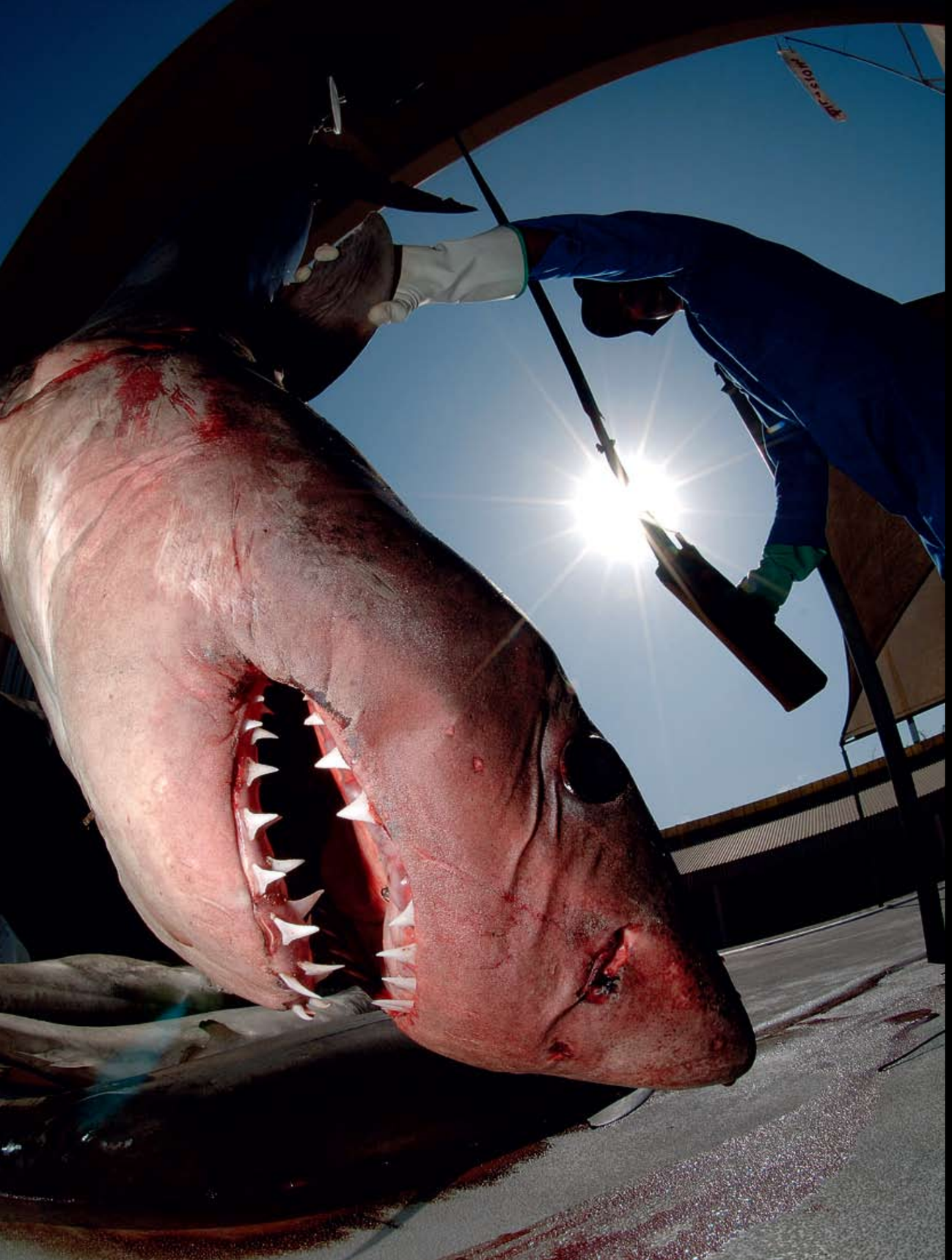


SHARK NETS

the real killers of the sea?

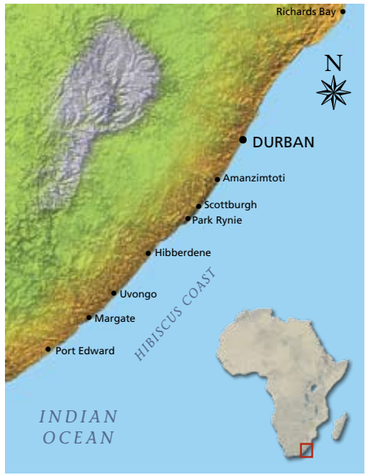
Back in the late 1950s, South Africa's popular east coast was rocked to the core when no fewer than five people were bitten by sharks in a matter of days. Mass panic ensued and holidaymakers fled, leaving resort towns deserted and financially ruined. In response to the public outcry, shark nets were installed along much of the KwaZulu-Natal coastline, where many remain to this day. Shark bite figures plummeted and everyone was happy… except, of course, for the sharks and the multitude of other animals that are killed every year. Photojournalist and marine biologist **Thomas P. Peschak** investigated the true cost of lethal bather-protection methods and asks, 'Are shark nets really still necessary?' ▸

TEXT & PHOTOGRAPHS
THOMAS P. PESCHAK/SAVE OUR SEAS FOUNDATION

THIS SPREAD Populations of great hammerhead sharks are declining worldwide and South Africa is no exception. Shark nets have been recording fewer catches of the species, which suggests a reduction in their numbers.

PREVIOUS SPREAD Unlike many ocean-users, surfers are generally well educated about sharks and the minimal risks they pose. In this photograph, shark-diving expert Mark Addison of BlueWilderness tests the reaction of a blacktip to a surfboard.

PAGE 38 Despite enjoying protected status in South Africa since 1991, great white sharks continue to be caught legally in the shark nets under an exemption.



ABOVE Fifty years ago, the only good shark was a dead one. Times may have changed, but sharks continue to instil fear in many people.

OPPOSITE Marine protected areas, like Aliwal Shoal off South Africa's east coast, afford some shark species respite from commercial and recreational fishing activities. Despite Aliwal Shoal's status, though, shark nets are situated within its boundaries.

6 January 1958. The popular South African holiday resort of Margate wakes to the rumbling sound of explosions. Those residents agile enough to scramble onto balconies and rooftops are greeted by the sight of the six-metre-high steely grey bow of SAS *Vrystaat* slicing through a glassy summer sea. Captain Terry-Lloyd steers the frigate to run parallel to the shore and at 09h24 orders the release of depth charges. Fifteen-metre cascades of seawater erupt into the air and the shock waves of the underwater explosions are felt many kilometres away.

Half an hour and 48 one-hundred-pound depth charges later, thousands of fish, their swim bladders ripped apart by the blast, flounder on the surface. A gunnery squad armed with high-powered rifles takes up position on the bow and fires on any fish larger than a metre that is still alive. By now, almost all of Margate's year-round residents are watching the spectacle, while holidaymakers pack furiously to join thousands of others fleeing inland in bumper-to-bumper traffic.

In a few short weeks between the dusk of 1957 and dawn of 1958, the Indian Ocean off the KwaZulu-Natal coast south of Durban was transformed from a summer playground for beach-ball-toting and sand-castle-building tourists into a sea of fear and death. Just before 17h00 on 18 December 1957, 16-year-old amateur lifesaver Robert Wherley was bodysurfing off Karridene when a shark bit one of his legs. Two days later, at Uvongo, 15-year-old Allan Green was also bitten by a shark while standing on a shallow sandbank, and succumbed to his injuries. Three days later, Vernon Berry was killed by a shark in waist-deep water off Margate. Just before New Year, 14-year-old Julia Painting was repeatedly bitten. She survived, but lost an arm in the incident. A few days later, Deryck Prinsloo suffered a shark bite at Scottburgh and subsequently died.

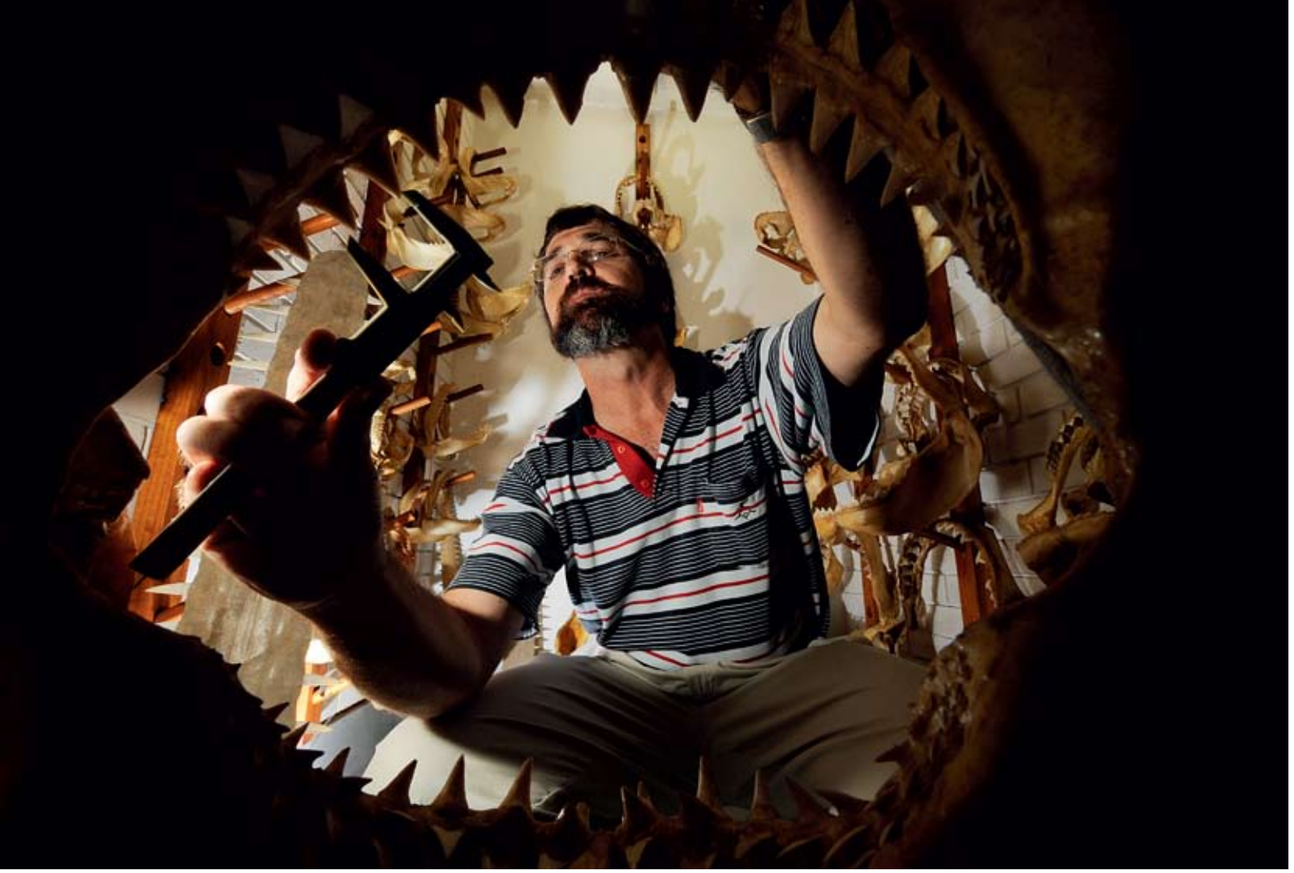
Mass panic ensued and soon many South Coast resorts stood empty. With the summer season ruined, hoteliers desperately needed a shark-free Easter season. Unfortunately, their prayers went unanswered.

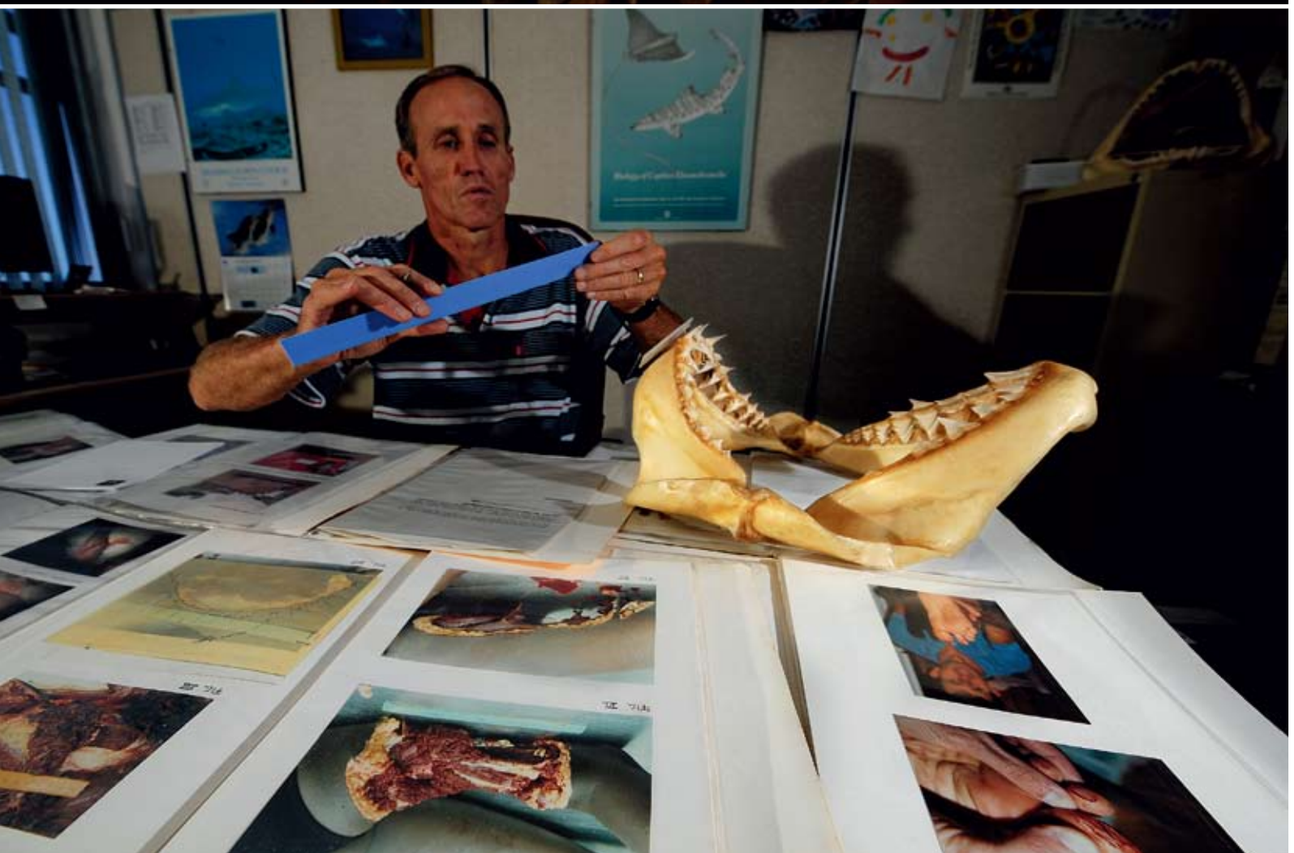
On 3 April 1958, Nicholas Francois Badenhorst was snorkelling at Port Edward when he was bitten by a shark. Two days later, a shark killed 28-year-old Fay Bester, a mother of four, in knee-deep water at Uvongo. Hysteria again spread through the resorts, turning them into ghost towns. In the months that followed, many businesses descended into financial ruin and bankruptcy.

In the wake of what is today referred to as 'Black December', the hard-hit South Coast tourism association demanded that the shark threat be dealt with immediately. Aside from the depth-charge approach, many coastal municipalities responded by taking inspiration from a precedent set off Durban's beaches seven years earlier and installed shark nets at many of the affected beaches. Multiple 200-metre-long nets were set parallel to the coast in 10 to 14 metres of water, approximately 400 metres from the shore. Many people falsely believed that the nets were a protective barrier that prevented sharks from reaching swimming beaches. In fact, they act as gill nets, designed to catch, suffocate and kill as many sharks as possible, the rationale being that reducing the number of sharks in the sea will also reduce the likelihood of them coming into contact with bathers and other ocean users.

Almost immediately after they were installed, the nets began to trap large numbers of sharks, prompting many other KwaZulu-Natal coastal towns to deploy them as well. Between 1960 and 1970, the total length of shark nets increased from two to 31 kilometres at 39 locations. By 1989, nets were in place at 64 beaches between Port Edward and Richards Bay, spanning some 45 kilometres. They have been so efficient ▶

THEY [THE SHARK NETS] ACT AS GILL NETS, DESIGNED TO CATCH, suffocate and kill as many sharks as possible





at killing large numbers of sharks that, apart from three non-fatal incidents, there have been no shark bites at beaches with shark nets since then.

Almost 50 years to the day after the first shark bite that heralded Black December, I am driving down the same coastal road that became clogged with the cars of panicked holidaymakers all those years ago. I have come to the South Coast on a photojournalistic quest to investigate the environmental cost of almost four decades of shark nets, and to determine whether they still have a role to play in a modern, conservation-conscious society.

Data from the Natal Sharks Board (NSB), the organisation tasked with managing and servicing the nets, show that between 1978 and 2008 approximately 33 684 large sharks were caught, of which 12.5 per cent were released alive. In addition to catching what the NSB terms 'dangerous' species, such as great white, tiger and Zambezi sharks, the nets also killed thousands of blacktips, ragged-tooths and other species that have never bitten people or only been implicated in very minor injuries.

Despite their name, shark nets don't only catch sharks; in fact, these gill nets are second only to dynamite as the most unselective fishing method known. They ensnare and drown a wide range of animals, from medium-sized game fish to 15-metre-long humpback whales. Since 2004, the nets catch on average 237 rays, 58 turtles, 53 dolphins and five whales every year. These figures used to be higher but, bowing to public pressure in the 1990s, the NSB began to implement measures to reduce the catches of marine mammals and sea turtles and, to a lesser extent, those of sharks not considered dangerous to people.

DESPITE THEIR NAME, SHARK NETS DON'T ONLY CATCH SHARKS; in fact, these gill nets are second only to dynamite as the most unselective fishing method known

The period between 1999 and 2004 saw the reduction of the length of each net installation by 30 per cent. In addition (owing to socio-economic reasons), some nets were removed completely and, by December 2003, the total length of nets was 28 kilometres, nearly 40 per cent down on the 1989 high. The NSB also began to remove the nets ahead of the sardine run in June and July every year, which resulted in major catch reductions of the dolphins and sharks that follow the shoals.

In 2007, the NSB began substituting drumlines for some of its nets on the Hibiscus Coast (Port Edward to Hibberdene), with the long-term view of possibly replacing all the nets along the KwaZulu-Natal coast. Drumlines are similar to longlines and are equipped with baited hooks to catch sharks. They are far more selective than nets, reducing the bycatch of marine mammals and sea turtles to almost zero. The numbers of 'dangerous' sharks caught by drumlines are similar to those snared by nets, but the effect on other shark species is dramatically different. Drumline mortalities of blacktip, spinner and ragged-tooth sharks are lower, whereas those of small dusky sharks are much higher. The trend in dusky sharks is worrying as the species' late age of maturity (20-plus years) and low reproductive rate render it vulnerable to even limited fishing impacts. On the other hand, the lower catches of blacktips and raggies, both important ecotourism species, are encouraging.

In spite of certain environmental benefits, there are concerns about the deployment of drumlines. Sectors of the surfing community fear that the bait, usually pieces of fish, will actually attract more sharks inshore. There is also a worry that smaller sharks thrashing on the hooks (they have more mobility and survive longer than when caught in nets) will attract larger sharks. The jury is still out on the likelihood of either of these scenarios, but dye tests to measure how far the scent of bait travels and video surveys of drumline catches should provide answers to these questions.

It is the tiger-shark dive operators at Aliwal Shoal, however, who are most concerned, fearing that the drumlines will increase the mortalities of tiger sharks. In recent years, the number of tiger sharks caught in nets has ▶

CAUGHT!

The figures below show shark net catches of nine of the most commonly caught species from 1978 to 2008. Depending on the species, between one and 65 per cent of the animals were released alive.

Great white shark *Carcharodon carcharias*
1 063

Tiger shark *Galeocerdo cuvier*
1 528

Zambezi shark *Carcharhinus leucas*
1 249

Whale shark *Rhincodon typus*
26

Ragged-tooth shark *Carcharias taurus*
5 441

Blacktip shark *Carcharhinus limbatus*
3 088

Scalloped, smooth and great hammerhead sharks *Sphyrna lewini*, *S. zygaena* and *S. mokarran*
6 610

Dusky shark *Carcharhinus obscurus*
6 790

Manta ray *Manta birostris*
1 580

OPPOSITE, TOP Sheldon Dudley, a senior scientist at the Natal Sharks Board, puts the fish caught in the nets to scientific use.

OPPOSITE, BOTTOM Shark biologist Geremy Cliff heads up the research division at the Natal Sharks Board. His scientific expertise lies in the field of shark bites.

climbed, a trend exhibited exclusively by this species. This phenomenon could be explained by the fact that tiger shark numbers are increasing, possibly because they are taking over vacant niches left by Zambezi sharks whose populations have been dramatically reduced.

It is also possible that changes in their behaviour or in the ocean are attracting tiger sharks inshore, bringing them into contact with the nets more frequently. In addition to these environmental factors, tiger sharks are supreme scavengers and may be tempted by the increased number of dusky sharks caught on drumlines. An experimental line set up before the Hibiscus Coast introductions caught a significantly more tiger sharks than the nets did.

Sharks are an important economic mainstay along this coastline; the shark-diving industry at Aliwal Shoal alone is worth at least R18-million (nearly US$2-million) per annum. Tiger sharks are particularly valuable alive as each one has been calculated to earn about R600 000 (US$63 500) in revenue every year. Any threats to this species posed by drumlines must therefore be taken extremely seriously.

SHARKS ARE AN IMPORTANT ECONOMIC MAINSTAY ALONG THE KWAZULU-NATAL COASTLINE; the shark-diving industry at Aliwal Shoal alone is worth at least R18-million (nearly US$2-million)

A recent study by the NSB revealed that between 1978 and 2003, only four of the most commonly caught shark species – the Zambezi, blacktip, scalloped and great hammerhead sharks – showed a decline in catch rates, which suggests diminishing populations. Together, the net reductions and temporary removals during the sardine run have halved the total shark catch from an average of 1 200 animals a year during the 1990s to 600 per annum in this decade.

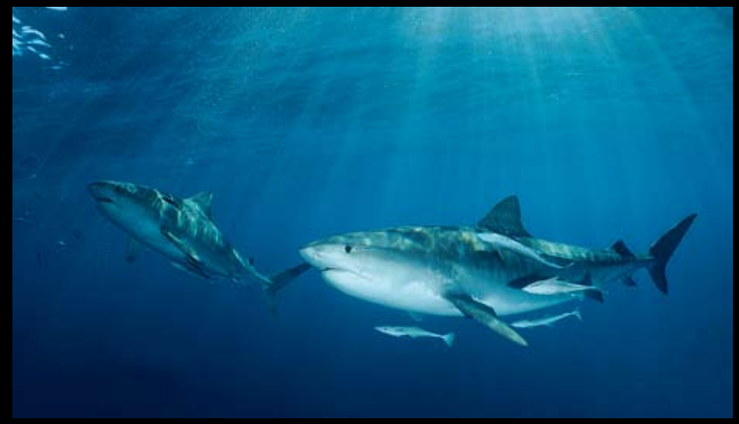
This is a fairly small amount compared to the South African commercial inshore line fishery, which lands at least 5 000 sharks every year, or the annual catch of one Mozambican fishing village, estimated at 3 500 sharks. It is just 0.0006 per cent of the global shark catch of 100 million per year.

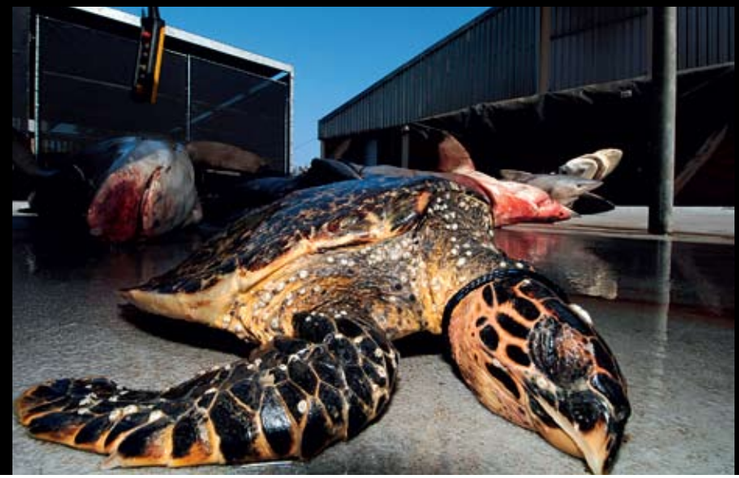
The nets, however, had been in place almost 30 years before any reliable catch statistics became available. This is unfortunate as catches always peaked immediately after installation, when the nets fished near-virgin shark populations. For example, the total shark catch in the Durban nets in the first year was 552 sharks; by the second it had dropped to 182. It would appear that shark populations were most affected early on, when nobody was taking scientific note.

We do know, however, that the nets were probably responsible for the localised extinction of some populations of Zambezi sharks. While the shark-net catches of the present day are unlikely to result in the extinction of a shark species, they may be preventing some populations from recovering to levels where they can adequately fulfil their designated role in the marine ecosystem.

Sharks are the lords of the oceans, occupying the apex of the marine food chain, and their removal by shark nets or other fishing methods is felt throughout the ecosystem. We have only just begun to learn of the nature of such effects, but one study in the Caribbean reveals that healthy shark populations are vital for the survival of coral reefs. Without sharks to control predatory reef fish, populations of species such as groupers and large snappers increase. These, in turn, reduce the populations of smaller algae- and seaweed-grazing fishes. Without these herbivorous fish, seaweeds and algae take over, smothering the corals and destroying an ecosystem that is not only essential for food production and mitigation of coastal erosion, but also harbours a treasure trove of novel medicinal compounds.

By keeping predators of commercially important species in check, sharks can be essential for healthy (*To page 52*)





ABOVE Sea turtles are an unfortunate bycatch of shark nets, but are almost completely unaffected by the use of drumlines.

TOP Tiger-shark tourism operators fear that newly installed drumlines will result in a higher catch of tiger sharks and threaten their livelihoods.

ABOVE, LEFT Conservationists install a temporary exhibition of photographs of sharks and other marine animals killed by shark nets to raise awareness of their impacts. Each photograph carries an estimate of the number of each species lost during a 25-year period.

WHO, THOUGH, IS GOING TO HAVE THE DRIVE, COMMITMENT AND DESIRE TO PROTECT AN animal that they are convinced is going to eat them the moment they venture into the sea?

fisheries too. The reduction of sharks in Chesapeake Bay in the US, for example, led to the collapse of the scallop fishery as ray numbers increased in the absence of their principal predators. Research on the role of sharks in South African waters is still in its infancy, yet it would be foolish to assume that they are exempt from such effects.

Notwithstanding the myriad environmental costs associated with shark nets, I believe that their gravest impact today is not on sharks, but on the human psyche. Simply put, they perpetuate the myth that only an ocean free of sharks is safe to swim in. As long as the nets and drumlines remain in place, generation after generation of beachgoers will continue to fear sharks. Are sharks really so dangerous that we have to kill them before they kill us? Statistically, the risk of being bitten by one is tiny – in 2008, with the world population soaring to 6.7 billion people, there were only 58 shark bites, of which just four were fatal. In comparison, 253 000 people died by drowning.

South Africa is one of a handful of countries in the world that continues to kill sharks in the name of bather safety. For a nation with an otherwise sound conservation ethic and currently pursuing lofty marine conservation goals, the shark nets are utterly out of place. Countries with a much higher incidence of shark bites have never felt the need to resort to shark nets or other lethal control measures. Last year, the US bore the brunt of 70 per cent of all shark attacks worldwide, yet nets are not, and have never been, in use there.

Fishing fleets kill in excess of 100 million sharks every year and the populations of many species, such as the oceanic whitetip, once amongst the most common of sharks, have declined by almost 90 per cent. Today, shark populations are probably in a similar state to those of the great whales in the mid-1900s after centuries of intensive hunting. Effective conservation campaigns to end whaling, supported by a wide cross-section of people who believed whales to be intelligent and friendly animals, were largely responsible for bringing most species back from the brink. For sharks to survive, far more people will need to know and care about the role that they play in the oceans. Who, though, is going to have the drive, commitment and desire to protect an animal that they are convinced is going to eat them the moment they venture into the sea?

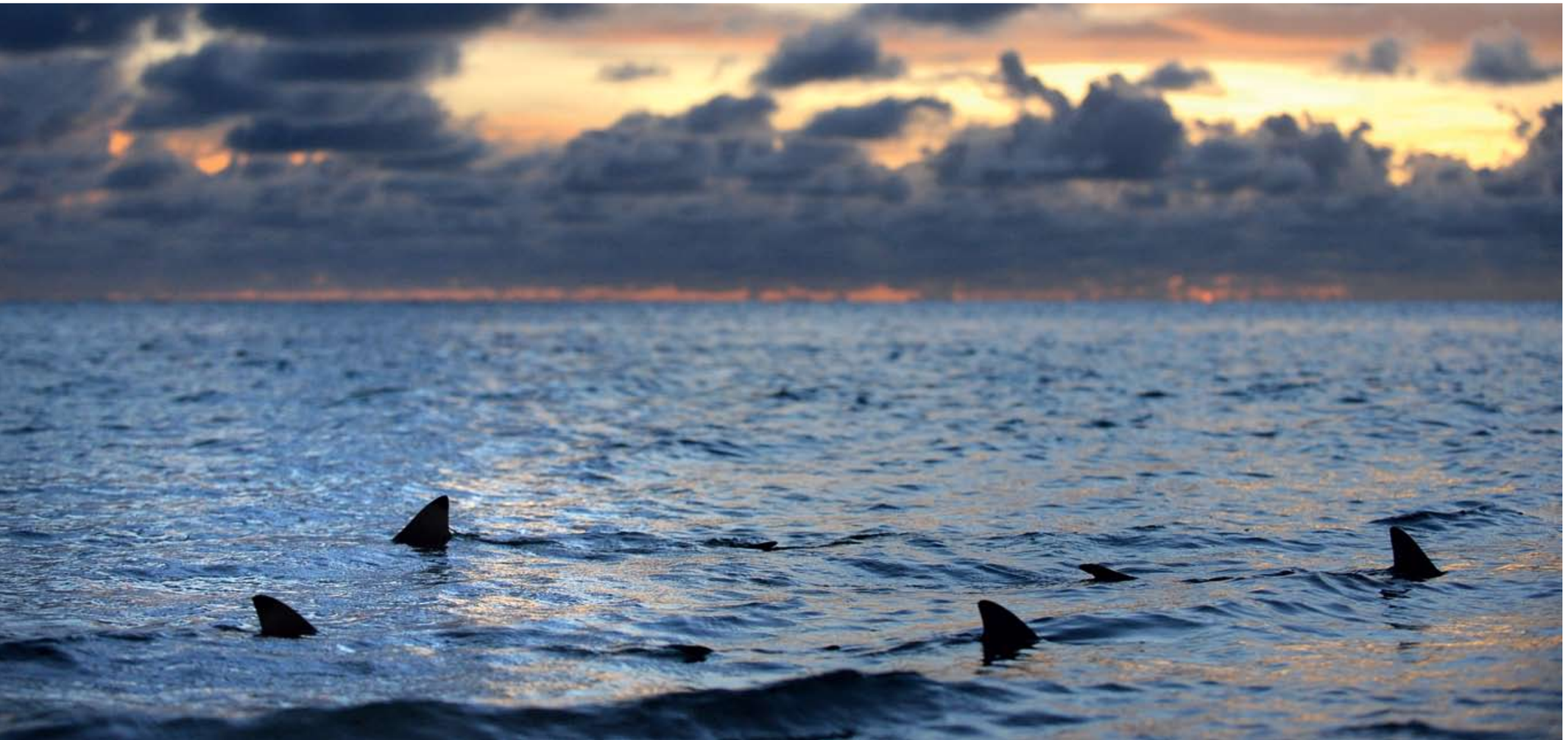
The shark nets were first installed, to great public applause, at a time when science knew significantly less about sharks and the real risks of spending time in the ocean. Yet even in these more enlightened times, one of the first questions still asked of lifeguards by visitors to KwaZulu-Natal beaches is whether there are shark nets in place. If the nets were removed, the NSB believes it would only be a matter of time before some shark species would rebound and the number of shark bites increase. In the current climate of fear, just one incident in the wake of net removals would guarantee more bad publicity for sharks and reinforce the belief that control measures are necessary.

Educating the public about the true risks of bites and the importance of sharks in the ecosystem is hugely important. Until a time when the majority of the population is more open-minded about the issue, it would probably be unwise to remove nets from heavily utilised beaches at Durban and Amanzimtoti. However, the nets and drumlines at more remote locations and those close to shark ecotourism hotspots, such as Park Rynie near Aliwal Shoal, could be dismantled immediately.

NGOs, government and the private sector must unite to put more resources into non-lethal means of ensuring swimmer safety, like stronger and more wide-ranging electronic repellents, and novel technologies like sonar. Shark spotters, used so successfully in the Cape, could also provide the public with a degree of comfort in the absence of nets.

Ultimately, though, whether or not South Africa continues to kill sharks in the name of bather safety is not up to the NSB, municipalities or resort owners; it's up to the general public. It is we who will determine the future of South Africa's sharks, and decide whether these shores will be infected by marine ecosystems in decay or caressed by healthy seas full of life. ■

Thomas P. Peschak is the chief photographer of the Save our Seas Foundation. He wishes to thank the Founder of SOSF for funding the research and photography for this article. He also acknowledges the insights and time given by many of the key role players on both sides of the shark-net debate.



SOS

Save our Seas Foundation (SOSF) is a non-profit organisation that implements and supports scientific research and educational projects focused on the marine environment.

SOSF aims to learn more about the role that marine species, particularly sharks and rays, play in maintaining a healthy ecosystem. It hopes to educate the public about the need to save our seas, especially the consequences of removing sharks and rays from the world's oceans, to support natural marine resource preservation and to conserve the marine realm. For more information on SOSF and the shark-net debate, go to ***www.saveourseas.com***

save our seas FOUNDATION

LEFT The psychological impact of shark nets is as significant as their effect on marine life, for they perpetuate the notion that only an ocean free of sharks is safe for humans to enjoy.

PREVIOUS SPREAD Recent studies have shown that healthy shark populations are essential for coral reefs to thrive. Without them, reefs can be transformed into algae-dominated ecosystems.