



BEYOND THE BITE

EVER SINCE *JAWS* HIT THE THEATRES, EVERYONE WHO DARES ENTER THE WATER “KNOWS” THEY RISK A SHARK ATTACK. BUT HOW DANGEROUS ARE THESE CREATURES REALLY, AND WHAT WILL HAPPEN IF THEY GET HUNTED TO EXTINCTION? **CAIN NUNNS** SPEAKS TO SOME SHARK EXPERTS AND A BITE VICTIM WHO, SURPRISINGLY, HOLDS NO GRUDGES

“IT FELT LIKE A REALLY SHARP PULL. THERE WERE A COUPLE OF SECONDS OF ‘S...T WHAT’S HAPPENED?’ THEN I LOOKED AT MY ARM AND THE BIG HUNK OF FLESH HANGING OFF IT. I WENT INTO A BLIND PANIC,” SAYS JOE FERRAR, RECOUNTING LAST YEAR’S BRUSH WITH A SHARK AT A MURKY RIVER MOUTH IN A REMOTE CORNER OF BALI, IN INDONESIA. “I HELD IT TOGETHER WITH MY OTHER HAND. IT WAS MANGLED — ALL ATTACHED, BUT JUST A BIG LUMP OF MEAT. WHEN I LET GO TO LOOK AT THE DAMAGE, MY ARM OPENED UP AND JETS OF BLOOD SQUIRTED OUT.” UNFORTUNATELY FOR FERRAR, WHO WAS ON THE FIRST LEG OF AN EPIC OVERLAND TRIP FROM AUSTRALIA TO EUROPE, HIS PROBLEMS HAD ONLY JUST BEGUN.

A short stay at the local clinic produced little besides petrified nurses, a quick bandage job and a dose of Valium. The four-hour pain-wracked cab ride to the capital, Denpasar — and a hospital that had cut its trauma teeth on Bali bombing victims in 2002 — planted the seeds of fear about losing his arm. That fear was compounded by a nine-hour wait for an operation that resulted in 120 exterior stitches and the fusing together of five tendons and reams

PHOTOS: GETTY IMAGES (WHITE SHARK); ROADTRIP: LIFETIME (ARM AFTER SURGERY)

THE GREAT WHITE SHARK (*CARCHARODON CARCHARIAS*) IS ONE OF THE MOST FEARED CREATURES IN THE WORLD. HOWEVER, WHILE IT IS A CARNIVORE, IT USUALLY PREYS ON SEA LIONS, SEALS AND TURTLES
OPPOSITE: JOE FERRAR'S ARM AFTER SURGERY, WITH 120 EXTERIOR STITCHES, A PERMANENT REMINDER OF HIS RUN-IN WITH A SHARK



FAMILY TREE

Sharks belong in the same class of fish, known as *Chondrichthyes*, as rays and chimaeras. The term refers to the fact that these organisms have no bones, and instead have skeletons of cartilage. According to the Florida Museum of Natural History, chimaeras are sort of fish-like — with no scales, a soft body and three pairs of beak-like teeth, they probably aren't what you picture when you think of fish. A big difference between sharks and rays is the way they move. A shark propels itself with the movement of its tail, while rays swim with their “wings” (pectoral fins).

of muscle fibres. But despite being far more likely (some sources say up to 75 times more likely) to be struck dead by lightning than bitten by a shark, Ferrar was still one of the lucky ones.

BITE VICTIMS

According to the University of Florida-administered International Shark Attack File (ISAF) — widely regarded as the



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world's definitive source of shark attack information — 2011 was a bad year for fatalities caused by bites from the ocean's top predators. While in all, unprovoked attacks dipped from 81 in 2010 to 75 last year, the number of deaths increased dramatically. The ISAF says that 12 fatalities were recorded in 2011, the highest yearly total since 1993. Over the past decade, an average of 4.3 people died annually after being attacked by sharks.

But don't rush to judgement just yet. The number is still relatively low, and scientists point to an increase in global tourism numbers, shoddy beach management, and underdeveloped rescue and medical infrastructure as the primary causes of last year's spike, particularly in locations not normally associated with shark attacks.

Three of those places — Reunion, Seychelles and New Caledonia — registered a total of five fatalities amongst them before local authorities began calls for culling programmes. Conservationists responded with calls of their own, accusing them of smoke-and-mirrors

public safety campaigns designed to protect tourism industries.

“Over the last decade, more people are going to places where there are sharks. Local communities are not prepared for the number of people going into the water,” said the ISAF's director George Burgess, in a February interview with AFP.

Burgess highlighted the United States, long a shark attack hotspot, as a country that has successfully minimised threats to the public through investments in education, beach safety personnel, and medical resources. “When trauma occurs, and when there are serious injuries in the water, we get people to the hospital quickly,” he noted.

The United States recorded 29 of the 75 global attacks last year. None of these were fatal. And while scary, the numbers pale in comparison to the wholesale slaughter of shark species on the open seas.

SHARK SLAUGHTER

A report by the Pew Environment Group, *Sharks in Trouble: Hunters Become the Hunted*, used an analysis of the Hong Kong shark fin trade to estimate that up to 73 million sharks are killed every year. The report found that some populations had declined by as much as 70 to 80 percent. Other estimates were higher still — up to 100 million in some cases.

“Estimating the number [of sharks] caught each year is very difficult because sharks go unrecorded through illegal fishing and finning operations. Some countries allow for fisherman to remove the fins of sharks and land the bodies separately. The real number is likely to be much higher than [the Hong Kong study] as it did not account for illegal catch, which contributes largely to the shark fin trade,” says Ryan Kempster, a marine neuroecologist at the University of Western Australia, in Perth, Australia.

“There are virtually no limits on how many sharks can be caught on the high seas,” he adds. “International trade restrictions apply to only a handful of species, even though nearly one-third of the world's sharks are threatened or near threatened with extinction.”

Kempster, who founded shark conservation group Support Our Sharks, says the single biggest threat to sharks is shark fin soup, long considered a delicacy in economically dynamic parts of Asia, particularly China. “Given the speed of economic growth in countries like China, more people are keen to show their wealth and status in society by serving the delicacy to their family and friends,” says Kempster.

Shark fins are one of the world's costliest food items, with prices reaching as high as US\$700 per kilogram or US\$100 for a single bowl of soup, according to the Pew Environment Group. And it's these prices

that are driving an opaque industry built on big payouts and even bigger profits. While nobody knows for sure just how much it is worth, the minimum value of the global trade has been estimated at a whopping US\$400 million a year.

"The fin industry is often shrouded in mystery, with many illegal operations undetected due to the inability to identify the source of fins once they have been removed from the shark. It is a very lucrative business with some very big players," says Kempster.

EFFECTS ON THE ECOSYSTEM

What is more readily known is the impact the trade is having on animals that scientists deem "crucial" to maintaining balance within marine ecosystems. According to the International Union for Conservation of Nature — more commonly known as the IUCN — of the 1,046 shark and ray species known to man, approximately 17 percent are considered to be threatened and 13 percent are considered near threatened.

"THE FIN INDUSTRY IS OFTEN SHROUDED IN MYSTERY, WITH MANY ILLEGAL OPERATIONS UNDETECTED DUE TO THE INABILITY TO IDENTIFY THE SOURCE OF FINS"

For more than 400 million years, sharks have regulated the marine food web. In the types of coral reefs commonly found in Asia and the Pacific, herbivorous fish such as parrotfish are needed to eat algae and provide space for corals to grow. When sharks are removed from the reefs, larger fish, which feed on the herbivores, multiply and stymie the growth of new coral.

"Sharks play a vital role in the oceans, in a way that an average fish does not. Most sharks serve as top predators, at the pinnacle of the marine food pyramid. They regulate the natural balance of these ecosystems, and keep prey populations in good condition, healthy and strong, enabling more naturally fit animals to pass on their genes," says Kempster.

"Studies have shown what happens to ocean ecosystems without sharks," he explains. "Fisheries shut down due to increases in normal prey species, which decimate commercial stocks. Coral abundance declines and is replaced by macroalgae. Species diversity declines.



PHOTOS: GETTY IMAGES (WHITE SHARK); CORBIS (WHITE SHARK AND DIVER, SHARK FINS); IMAGINE (FIN FICTION)



ABOVE: SCIENTISTS SAY GREAT WHITES ARE "NATURALLY CURIOUS" AND WILL EXAMINE THINGS (LIKE PEOPLE) THAT THEY COME INTO CONTACT WITH. UNFORTUNATELY FOR US, WITH NO HANDS, A SHARK'S METHOD OF EXAMINING OBJECTS IS USUALLY BY BITING THEM (FAR LEFT) LEFT: SHARK FIN SOUP IS A DELICACY IN MANY PARTS OF ASIA, FUELLING THE TRADE, WHICH KILLS MILLIONS OF SHARKS EVERY YEAR

FINS, FUN, AND FRICKIN' LASER BEAMS

GREEK ATTACK

IN THE FIFTH CENTURY BC, ANCIENT GREEK HISTORIAN HERODOTUS WROTE A DRAMATISED ACCOUNT OF SHARKS RIPPING INTO AN ENTIRE PERSIAN WAR FLEET. BROKEN UP BY SHORE ROCKS, THE PERSIAN SHIPS WERE THEN EASY PREY FOR THE ANIMALS, WHICH "SEIZED AND DEVOURED" MANY A FLAILING SAILOR. ACCORDING TO HERODOTUS, 300 SHIPS WERE DESTROYED AND MORE THAN 20,000 MEN KILLED BY THE SEA AND THE HUNGRY HUNTERS



FIN FICTION

POOR AND DESPERATE BECAUSE OF UNWISE INVESTMENTS, AUTHOR MARK TWAIN IN 1897 WROTE A BOOK CALLED *MORE TRAMPS ABROAD* TO RAISE FUNDS. IT FEATURED AN OUTLANDISH STORY ABOUT HOW REAL-LIFE MUGIL CECIL RHODES MADE HIS FORTUNE. WHILST WANDERING POOR IN SYDNEY, RHODES CAUGHT A SHARK WITH A SCRAP OF NEWSPAPER IN ITS BELLY. THE NEWSPAPER DETAILED A WAR BETWEEN FRANCE AND GERMANY, PROVIDING INFORMATION THAT ALLOWED HIM TO CORNER THE MARKET IN WOOL AND MAKE A KILLING



OUR ANSWER IS "NEITHER"

COMEDY SITE YOURATHER.COM, WHICH ASKS OUTRAGEOUS HYPOTHETICAL QUESTIONS, POSED A DOOZY: **WOULD YOU RATHER FIGHT A SHARK WITH BEAR ARMS, OR FIGHT A BEAR WITH SHARK ARMS?** "THE BEAR WILL HAVE NORMAL FEET AND THE SHARK WILL STILL HAVE GILLS," THEY HELPFULLY CLARIFIED

DRAWN EVIL

WHAT'S SCARIER THAN A SHARK? AN INTELLIGENT SUPERHUMAN GOD-LIKE SHARK WITH ARMS AND LEGS, OF COURSE. IN THE DC COMICS UNIVERSE, KING SHARK IS NOT TO BE TRIFLED WITH. ALSO KNOWN AS NANAUE, HE IS THE SON OF THE HAWAIIAN SHARK GOD. THE VILLAIN HAS BARED HIS JAWS AT EVERYONE FROM AQUAMAN TO SUPERBOY AND BATMAN





PHOTO: GREGORY SKOHAL

RIGHT: THE GREAT WHITE SHARK, THOUGH NAMED FOR ITS WHITE UNDERBELLY, HAS A SLATE-GREY UPPER HALF THAT CONTRIBUTES TO ITS HUNTING PROWESS. SINCE THESE FISH USUALLY ATTACK FROM BELOW, THEIR GREY COLOURING LETS THEM BLEND IN WITH THE SEA FLOOR AND SNEAK UP ON PREY

UNLIKE MOST OTHER FISH, NOT ALL SHARKS LAY EGGS. SOME GIVE BIRTH TO LIVE YOUNG

Ecological chain reactions are set in motion that cannot be undone. We should fear a world without sharks far more than one with them."

But it's not just the fin industry that is to blame. Following a spate of attacks in Hawaii, local authorities embarked on a far-reaching cull of the indigenous tiger shark (*Galeocerdo cuvier*) population, despite strong opposition from scientists and conservationists. Most scientists say cull programmes are emotional "knee-jerk" reactions designed to assuage public concerns, and have little impact on reducing the number of attacks.

The Pew report found that a study on the removal of tiger sharks from Hawaii's French Frigate Shoals ended with disastrous results. Once the sharks were gone, the seabird population skyrocketed, along with their predation on tuna and jacks. Significant declines in the populations of both these species put the kibosh on what were lucrative commercial fishing operations.

SAVE OUR SHARKS

However, in some parts of the world, attitudes are changing, as communities realise the sustainable economic benefits of shark tourism, which generates an estimated US\$78 million annually for the Bahamas alone. Other paradisiacal playgrounds, such as Palau, the Maldives and Honduras, have been quick to catch on, designating swathes of their waters as marine sanctuaries.

"You remove a shark from an environment and it's a one-time pay-off, and in most cases it's a very low pay-off," says Dr Gregory Skomal, a marine biologist and head of the Massachusetts Shark Research Program. "You keep that animal in the water and it's a renewable resource. Places like Palau are benefitting from this because people are willing to spend serious money to dive with a shark in a remote place."

Skomal, a veteran of Discovery Channel's *Shark Week* programming, is in the midst of this debate about conservation and beach management at Cape Cod, in the US state of Massachusetts, the setting for Steven Spielberg's seminal epic, *Jaws*. Skomal, who has worked with sharks for almost 30 years, says a resurgence of great whites (*Carcharodon carcharias*) in close proximity to heavily populated swimming areas has come about through an explosion in the local seal population.

"[In July] for the first time in 76 years, we had an attack by a great white. It almost looked like it just gumped [the victim]. But the extent of the damage was just incredible. The shark didn't want to eat that person. If it wanted to, it would have," says Skomal.

Experts say humans aren't on a shark's food wish list. Most bites, they say, stem from "exploratory action" on the part of sharks. But in the case of tiger, great white and bull sharks, which are reportedly responsible for almost all of the fatalities recorded, those nibbles can result in tremendous blood loss. And the situation is only compounded by a lack of readily available medical care.

"We are moving in the right direction and attitudes are changing through education, conservation regulations — and maybe even *Shark Week*. This attack hasn't led to an emotional reaction. The community realises that there are parts of Cape Cod where you are taking risks by going out in deep water. And you just don't want to do that," notes

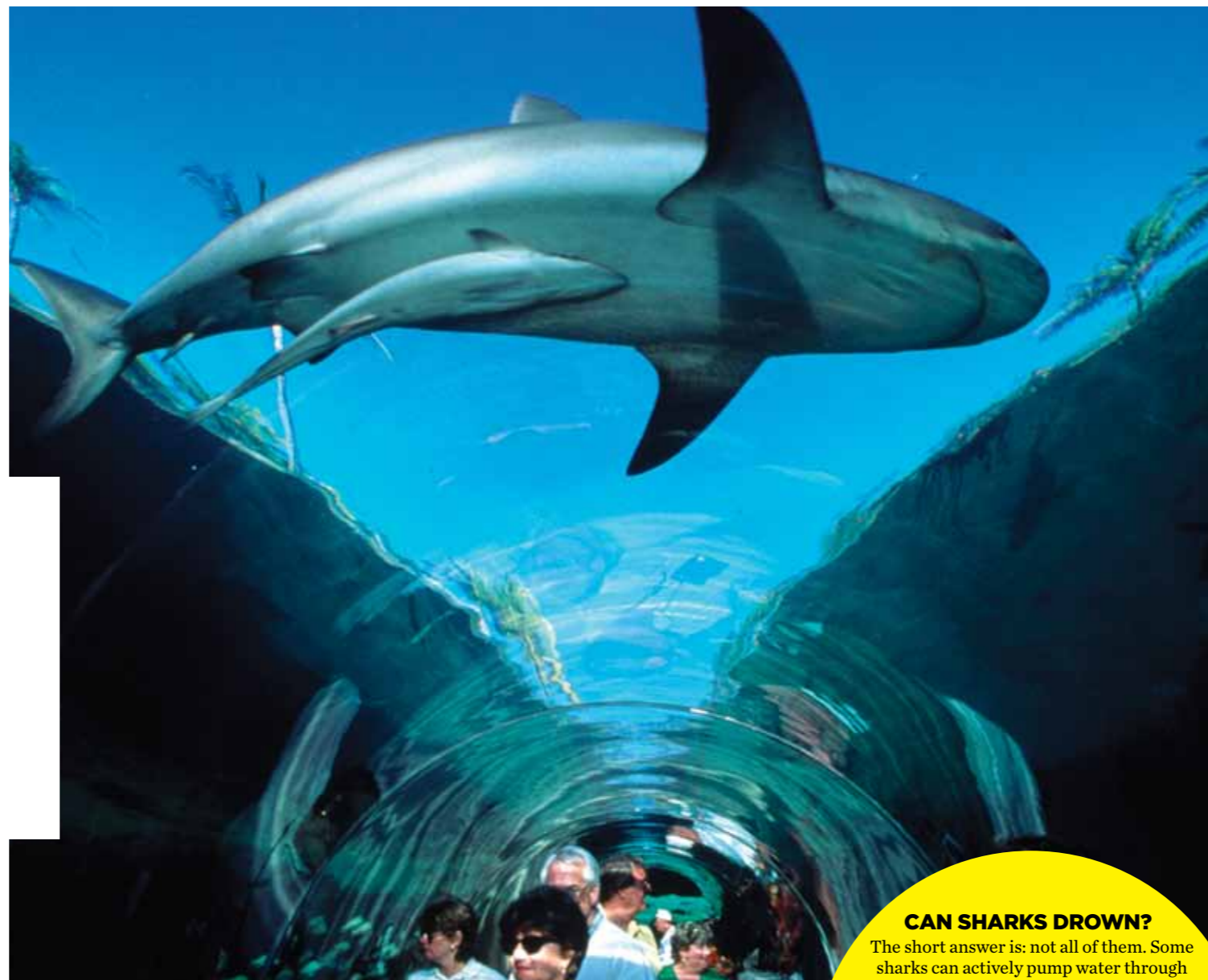
"YOU REMOVE A SHARK FROM ITS ENVIRONMENT AND IT'S A ONE-TIME PAY-OFF, AND A VERY LOW ONE AT THAT. YOU KEEP THAT ANIMAL IN THE WATER AND IT'S A RENEWABLE RESOURCE"

Skomal. "We got a lot of media attention but none of it was along the lines of sharks being evil. The community was logical, but 20 years ago, with the presence of these sharks off our beaches, we would have most likely seen massive culling."

Skomal, who calls his great white diving experience "the most exciting thing I've ever done and a hell of an adrenaline rush", describes an incident in 2004, when a great white became stranded in a small coastal pond near Martha's Vineyard, an island near Cape Cod. His team was charged with removing the shark, unharmed.

"I received hundreds of emails, and 99 percent of them were from folks encouraging me to save the shark. Ironically, about half a century earlier, a similar event happened near Cape Cod, and within two hours the town went out and killed it," he says. It is a sentiment shared by Joe Ferrar, who despite his Bali setback, a few nightmares, flashbacks and "losing it" on a Malaysian beach, managed to eventually resume his travel plans — and is now gearing up for a surf trip to El Salvador.

Despite his trauma, Ferrar is philosophical. "I was in the wrong place at the wrong time. It was a random occurrence," he says. "So I try and think about it logically. It's just one of those things." ●



ABOVE: SWIMMING WITH SHARKS ISN'T FOR EVERYONE, BUT YOU CAN STILL COME PRETTY CLOSE TO ONE AT AN AQUARIUM
LEFT: OVERFISHING PARTLY CAUSED BY THE BOOMING DEMAND FOR FINS IS THREATENING THE EXISTENCE OF MANY SPECIES OF SHARK

CAN SHARKS DROWN?

The short answer is: not all of them. Some sharks can actively pump water through their mouths over their gills, and hence can lie still and not suffocate. At the other end of the spectrum are the sharks that can't breathe that way — and yes, these species will drown if they hold still long enough. Incidentally, there have been at least two recorded incidents of a killer whale grabbing a great white, holding it immobile until it drowns, then eating it. After those incidents, the local population of great white sharks disappeared for a while, one member even swimming 3,200 kilometres away.

FINS, FUN, AND FRICKIN' LASER BEAMS

EVIL SHARKS

SHARKS GET EVEN DEADLIER IN THE 1997 FILM *AUSTIN POWERS: INTERNATIONAL MAN OF MYSTERY*. IN THIS JAMES BOND SPOOF, VILLAIN DR EVIL YEARNs FOR WHAT EVERY MEGALOMANIAC WANTS: "SHARKS WITH FRICKIN' LASER BEAMS ATTACHED TO THEIR HEADS!" SADLY, IT CAN'T BE DONE, BUT HIS EVIL SECOND-IN-COMMAND (NUMBER TWO) DOES HAVE AN ALTERNATIVE: MUTATED SEA BASS. "ARE THEY ILL-TEMPERED?" QUERIES DR EVIL. ABSOLUTELY. "OH WELL, THAT'S A START"



NICE SHARKS

FEATURING JACK BLACK AS THE VOICE OF A LOVEABLE SHARK WHO BEFRIENDS THE MAIN CHARACTER OSCAR (VOICED BY WILL SMITH), THE 2004 ANIMATED FEATURE *SHARK TALE* PORTRAYS THE NORMALLY LOATHED ANIMALS AS CARING AND THOUGHTFUL (BLACK'S CHARACTER, LENNY, IS A VEGETARIAN) — THOUGH SOME EVIL SHARKS FEATURE TOO

MUSIC TO SWIM TO

IN 1975, STEVEN SPIELBERG'S *JAWS* HIT THE SCREEN AND BECAME THE BIGGEST SUMMER BLOCKBUSTER IN HISTORY. BUT THE REAL STAR OF THE SHOW WAS *THE HAUNTING SCORE* BY JOHN WILLIAMS. ALTHOUGH MOST OF THE SCORE WAS JUST A REPEATED PATTERN OF TWO NOTES, THE THEME'S SIMPLICITY MADE IT AN *INSTANT CLASSIC*, EARNING WILLIAMS AN ACADEMY AWARD, AMONG OTHER ACCOLADES



FUR, SUCKERS AND TEETH

THE INTERNET CONTINUES TO TERRIFY READERS WITH A TOTALLY PLAUSIBLE **PHOTOSHOPPED "BEARSHARKCTOPUS"** WHICH, AS YOU MIGHT IMAGINE, IS A BEAR BODY WITH A SHARK FACE AND OCTOPUS TENTACLES FOR ARMS. IT CURRENTLY TOPS *DCM*'S LIST OF **LEAST DESIRABLE PETS**