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The truth about sharks: Far from being 'killing machines', they have personalities, best friends and an exceptional capacity for learning



A tribe of marine scientists has set up base on the tiny island of Bimini in the Bahamas to unravel the secrets of the creature most misunderstood by man. Oliver Duff dives in...

OLIVER DUFF | Friday 28 November 2014

I was snorkelling far offshore when the bull shark appeared. Movement in the corner of my eye, then a silhouette 30 metres away, slipping through the turquoise haze on that late afternoon. He was fat, with a bright white belly and distinctive snub nose. He studied the two-legged intruder and began to circle, slowly closing the gap: 20 metres, 15, 12...

I stuck it out for as long as I dared, then, trying to avoid panicked splashing, I kicked for the boat, not taking my eyes off him. You don't want to mess around with a bull.

These waters off tiny Bimini, in the Bahamas, teem with sharks. A tribe of marine scientists, led by the grandfather of shark biology, Samuel 'Doc' Gruber, has set up base on the island, determined to unravel the secrets of the creature most misunderstood by man. The research coming out of the

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Bimini Biological Field Station – better known around the world as the Sharklab – is transforming our knowledge of what glides beneath the seas and oceans.

Turn off the spine-tingling music and forget everything you thought you knew about this solitary, "mindless killing machine". Sharks have individual personalities. They socialise, choose best friends and create social networks of unusual complexity. They can be trained by humans to complete simple tasks, much more quickly than rabbits or cats, for instance, and retain the knowledge for much longer. Sharks also teach each other new tricks: how to find food, identify predators and charm mates. Like sea turtles, some travel huge distances to return to their own birthplace, again and again, to give birth themselves. Most don't need to swim continuously to survive. And rather than being near-blind and reliant on smell, which is the general perception, they in fact have advanced sight. They feel pain. And the boldest sharks face a greater risk of dying before adulthood.

Why does any of this matter? Well, we're killing about 100 million sharks every year, 11,000 an hour, either for the Chinese soup trade (where the de-finned shark is chucked back into the sea to sink and die on the bottom) or as bycatch.

Marine biologist Jean-Marie Ghislain's stunning images of sharks

The idea of shark-free waters may seem appealing, until you consider the havoc that would be unleashed on the rest of ocean life if that happened. Sharks, as apex predators, balance ecosystems, stopping animals in the middle of the marine food chain from proliferating and destroying life still further down. Sharks also pick off the weakest, sickest and slowest fish, helping to prevent the spread of disease and parasites, and strengthening the gene pool of prey species. That's why scientists consider sharks to be 'keystone' species in marine ecosystems. Take them away and the structures collapse.

Five years ago, I was a phobic rattled by shadows in the swimming pool. Now I'm a shark nut. I have free-dived – no cage, armed with nothing more than a snorkel and an underwater camera – with about 100 big sharks (by that, I mean longer than two metres). No 'great' whites or oceanic whitetips among them, but tiger, yes, bull, great hammerhead, sand tiger, lemon, Caribbean reef, blacktip, grey, and perhaps the laziest, the nurse shark. (This sluggish character loiters near the bottom and sucks in small prey that happens to pass by.) I have not yet been eaten on sight, but I have been stared at with alarm and curiosity.

Underwater, I'm still prone to pangs of claustrophobia from poor visibility, or agoraphobia from the vast expanse, but I've rationalised my fear of sharks. Only about a dozen of the 500 species have posed any danger to humans, and even then, very rarely. Calling sharks man-eaters is like judging

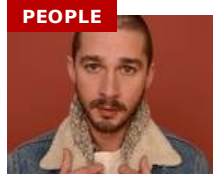


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the whole of humanity by a handful of serial killers. Every year, billions of people around the world enter shark habitats; on average, four of them die.



Shark and diver interact at Tiger Beach, Bahamas (Jean-Marie Ghislain)

My infatuation began on the Barrier Reef in 2009, scuba-diving in Queensland. Your heart drums the first time you see that unmistakable shadow emerge from the gloom. Two long grey reef sharks approached us. Time stopped as they span back and forth, inspecting the huddle of novice divers. Then, as suddenly as they had appeared, they slipped back into the unseen Pacific. I was awed by their grace, power and inquisitiveness.

Fast-forward to 2014 and I'm on South Bimini, 50 miles east of Miami, to see the Sharklab scientists in action. I spotted an advert online: anyone can visit to take part in their 'research experience', five days a month where outsiders can live and study at the field station. It's a means of fundraising and spreading the urgent conservation message. (I paid my own way.)

The biologists give lectures and take us out on the boats to help with their day job: capturing, tagging and releasing sharks, then tracking their movements, in the hope of finally understanding their behaviour. You get to wear swimming trunks to the office, but have to watch your fingers.

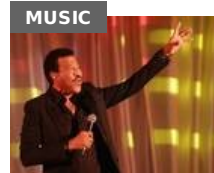
Uniquely in the Bahamas, all species of sharks are protected. If you get in the clear, warm water, you will meet large sharks. So an hour after landing at the airstrip, I'm already on a small boat a mile offshore, ready to jump in.

All around us, the dorsal fins of large Caribbean reef sharks chop the surface. Looking over the side I could touch them as they glide beneath us. The main thing to remember is not to jump in right on top of one – unlikely to be enjoyable for either party.



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A diver - protected by a chain mail suit - in the middle of feeding (Jean-Marie Ghislain)

Within seconds of plunging in, we're face-to-snout with them. Caribbean reef sharks are the bold, boisterous puppy dogs of the Bahamas. It's utterly thrilling, sometimes too intense for comfort as they dart by – you have to fend off the nosier ones with a raised fin. After 40 minutes, I don't want to get back on the boat.

The island looks stunning from the air – a spit of sand in coral shallows –but life onshore is less glamorous. The scientists live in a crowded bunkhouse with little privacy and personal space, hungry bugs and stifling heat.

The lab's executive director, Dr Tristan Guttridge, aged 32, admits: "It's not easy to get time alone or to reflect. People here endure some tough conditions to experience life-changing moments, like free-diving with a great hammerhead."

While free-diving with sharks cannot ever be completely 'safe', it is a calculated risk, taking account of species, water conditions, and the size of the diving group. I reasoned that the scientists wanted to send us home with all our fingers and toes.

The real stars of the show at Bimini are the great hammerheads, *Sphyrna mokarran*. These charismatic, elusive and endangered giants grow to six metres long, and for a few months a year they live in the Bahamas Shark Sanctuary. Being close to such a beast – buffeted by its wake as it rockets past your head – leaves you certain of your insignificance in the cosmos.



A startled great hammerhead shark at Rangiroa in French Polynesia (Jean-Marie Ghislain)

We floated in the shallows following three of them for an hour. They are superb hunters and glorious to watch, as they spin and dive through the water column, swinging their wide heads packed with electro-sensors over the seabed to scan for hidden stingrays or flatfish. Their attitude to us? Majestic indifference.

Dr Guttridge and his colleagues have pioneered a research project to find out why the great hammerheads visit the Bahamas, where they have come from and where they go. Great hammerheads respond badly to capture – 90 per cent caught on a line die – so they have to be individually tagged by free-diving researchers who hold their breath, kick down and spear an acoustic transmitter through the shark's dorsal fin.



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The first results are in: one female swam a staggering 750 miles from Bimini up to Virginia in four weeks, making dives as deep as 200 metres on the way. The suspicion is that great hammerheads swim from the Caribbean to the United States, where they have no federal protection and fall prey to commercial and sports fishing. To save them from extinction, biologists first need to know exactly where they go.

One of the extraordinary things about the Sharklab is its genetic database, which contains 3,500 lemon sharks, 500 tigers, 200 blacktips, 150 nurse and 50 bulls. This allows the team to discover family ties between sharks and has provided definitive evidence of mothers returning to their own birthplace to deliver their young. Recently the researchers were delighted to catch a lemon shark whose pups were first detected back in 1993, making her at least 37 years old.



A territorial female attacks, forcing divers into a safety cage (Jean-Marie Ghislain)

Debunking the popular image of sharks as killing machines is Jean-Sebastien Finger, a 29-year-old marine biologist who swapped Paris for Bimini.

"They are not machines, they have personality," Finger explains. He is conducting the first study into the personalities of lemon sharks – the lab mice of the sea (but feistier). By observing them for thousands of hours he's built a "Facebook of sharks" and found that they have their own distinct personalities which are consistent over time. Some are sociable, bold, others shy, territorial, mellow, novelty-seeking, risk-averse, leaders, followers...

"You can't generalise behaviour of one individual to a species," he cautions. The research may eventually be compared across species, including humans, to try to shed light on the evolution of personality.

Another man dedicated to challenging stereotypes is the Belgian photographer Jean-Marie Ghislain. He has chosen art over science, publishing his stunning black-and-white work (pictured on these pages) in a new book, *Shark: Fear and Beauty*. Ghislain was scared of water until the age of 52, when he was still working in real estate. A friend persuaded him that he could overcome this fear by swimming with sharks. Over the past five years he has spent thousands of hours diving with them, trying to capture their beauty and presence. "I realised it was a projection of a fear," he says. "Once I faced the sharks, it was gone."

Danger is something few of us experience. For me, though, swimming with sharks is about more than sensing your own mortality. It's the exhilaration of finding the last real wilderness on Earth, just a few inches beneath the ocean

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surface.

And if all this seems too much, you will soon be able to marvel at sharks without getting your hair wet. The BBC's Natural History Unit has been filming a startling new series, Shark, scheduled for broadcast on BBC1 next year. Four decades after Steven Spielberg's hysterical big-screen effort, rehabilitation cannot come soon enough.

For more on Bimini Biological Field Station, visit biminisharklab.com

'Shark: Fear and Beauty', by Jean-Marie Ghislain (Thames & Hudson, £29.95)

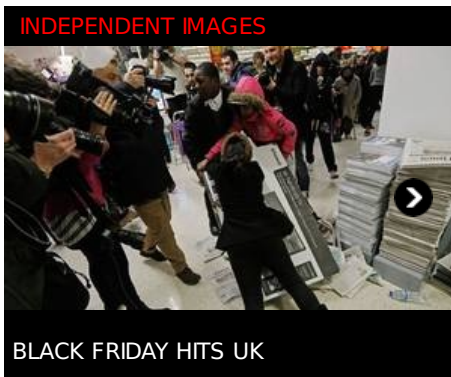
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