understanding THE SHARK FACTOR

By Kerry Wright

"There are 400 known species of shark. 100 of these are found in South African waters. The statistics show us that out of these 100 only 6 have been indicated in 'incidents' with humans along our coastline. Out of the 6 only three, the Tiger, the Bull (Zambezi) and Carcharodon carcharias aka the Great White Shark are considered under certain circumstances to be a threat to humans."

A Great White curiously investigates a Jelly Fish. Despite their apex predator status they are cautious creatures. © Peschak

It hasn't been a great year for shark attacks on our coastline. Conversations in the line-up and the car park, particularly in the Cape, frequently turn to what's behind the recent increase in activity.

Carcharodon carcharias aka the Great White Shark - it's the world's ultimate ambush predator that's been around for 400 million years. A six-metre-long, two-ton, 300-toothed ocean-dwelling apex predator who doesn't blink. It lives where we play, and that makes us nervous. We don't want to be the next statistic.

Emotions are running high, and we want answers, and rightly so. Because answers mean we can understand the risk, maybe even mitigate it; be less likely to become that statistic. Our fear isn't irrational; every time we step into the ocean we enter the proverbial food-chain. So irrational fear no, but magnified, maybe.

But it's not only Whites we should be wary of; Tigers and Zambezis have also been implicated in attacks along our coast, particularly in the warmer waters of the Eastern Cape and KwaZulu-Natal.

Tiger Sharks here are traditionally mellow, although the warmer the water, the more active they are. Divers swim with them off Aliwal Shoal and Scottburgh surfers see them regularly. This doesn't mean they don't pose a risk to surfers – they're wild animals after all – but we aren't part of their normal diet.

Bull sharks, or Zambezis as we know them, frequent the shallow warm waters of all the world's oceans. This, coupled with their unique ability to swim huge distances up freshwater rivers (hence the name Zambezi), means they're regarded as the most frequent attackers of water-users globally. Although more common in our warmer waters, they've been found as far west as the Breede River, when a female Bull shark was followed 30km upstream.

They're territorial and aggressive, which together with their preference for shallow waters brings them into regular contact with people. Victims are often attacked in murky water near flooded rivers – the shark's ideal feeding environment as they scavenge on rays, fish and small sharks. Most attacks on people are thought to be investigations rather than predations.

Zambezis are widely believed to be responsible for the recent spate of attacks in Port St Johns: five attacks, four of which were fatal, over the last three years. Speculation grew about the reason for the sudden spike in attacks.

Most plausible is the exponential increase in water-users in that area, with surfing being a relatively new pursuit for local youths. Poor waste management, including offal being thrown into the river, has also been blamed.


Tiger Sharks are more common in warmer waters and are often seen by divers, fishermen and Surfers in the Aliwal/Scottburgh area. © Peschak

Although the four confirmed Zambezi attacks in SA since 1990 are far fewer than those attributed to Great Whites, it's possible that a large proportion of the attacks in which the species is unconfirmed due to poor water visibility may be attributable to Zambezis, particularly along the KwaZulu-Natal and Transkei coasts.

Crunching the numbers

There's a significant disparity between "real" and "perceived" risk thanks to the emotion and media furore surrounding sharks.

Admittedly the four reported Great White attacks along the SA coastline this year haven't helped. Last year there were two. At first glance a 50% increase over last year's figures seems to support the perception that attacks are on the up. But is this an overall upward trend? It just doesn't seem that way when you crunch the numbers.

In 1990 a group of medical professionals, marine biologists & shark behaviourists formed the Global Shark Attack File (GSAF) to improve understanding of when and why sharks sometimes bite us, and hopefully lessen the likelihood of such accidents.

Combining the GSAF and KwaZulu-Natal Sharks Board records of confirmed Great White encounters along our entire coastline since 1990, there're a total of 63 encounters. Applying some brain-melting statistical analysis to the numbers tells us we can be 95% certain that there's no overall trend in human/Great White encounters in SA over the past two decades. It's not going up, it's not going down. What we have is a graph of random alternating peaks and troughs, not one heading skywards as the tabloid media would have us believe.

Looking at a regional level for the same time period also didn't reveal any statistically significant sign of upward trends either. Overall there have actually been fewer shark encounters along our coastline in the first decade of this century (2000-2009, 26 attacks) than the 1990's (1990-1999, 31 attacks).

Although an upward trend in attacks is evident when looking from the early 1900s, both the International Shark Attack File and GSAF caution against reading too much into this apparent increase. Scientific and media coverage of shark attacks back then was far less inclusive, with technological advancements since the 1980s having considerably improved our ability to report and record these attacks.

There's concern around an apparent increase in the number of attacks around the Greater Cape Town area. Despite no statistical evidence of an upward trend from 1990 to October 2011, there were more attacks in the 2000-2009 decade (6) than the 1990-1999 period (12). However, before we quickly point to this as evidence of increasing attacks, consider that there were 10 attacks in the 1980s. So all we can conclude is that the number of Cape Town attacks in the first decade of the 21st century has been higher that the '90s, but not dissimilar to the '80s.

The ups and downs in attacks from year to year, and decade to decade, are motivated by a variety of factors, be they oceanographic or meteorological conditions, population demographics (both human and shark), or social and economic conditions that influence our time spent in the ocean.

Irrespective of the absence of an upward trend in attacks over the last 22 years, Great White sharks have become increasingly conspicuous, particularly in the False Bay region. Anecdotal evidence from many long-term Fish Hoek residents attest to this.

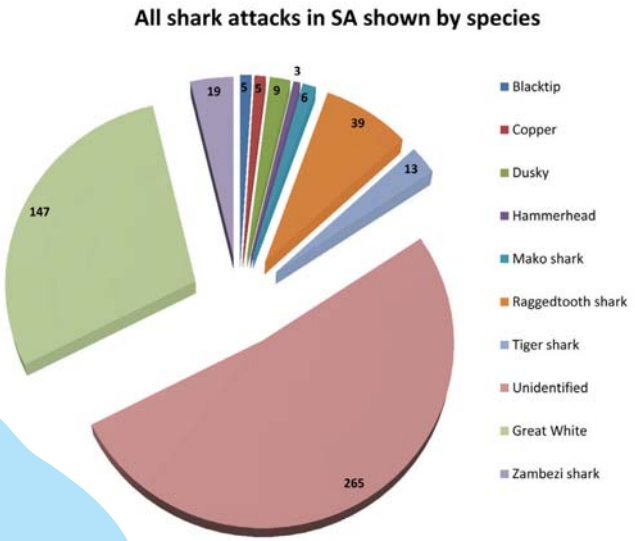
"I literally grew up in the water and on the beach of Fish Hoek. Today you wouldn't dream of swimming out into the bay, let alone swim across it with just your speedo on." Alan Van Gysen

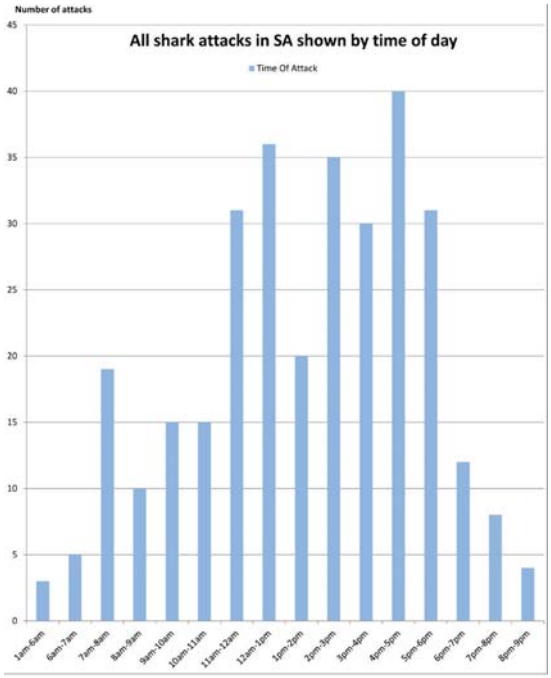

Named the Bull Shark for it's pugnacious disposition and muscular front body, it has also been named the Zambezi after its propensity to swim far up the Zambezi River and other rivers along the east coast of Africa. It is often found in murky or brackish water. © Peschak

SHARK ATTACK STATISTICS FOR SOUTH AFRICA 1913 - NOV 2011

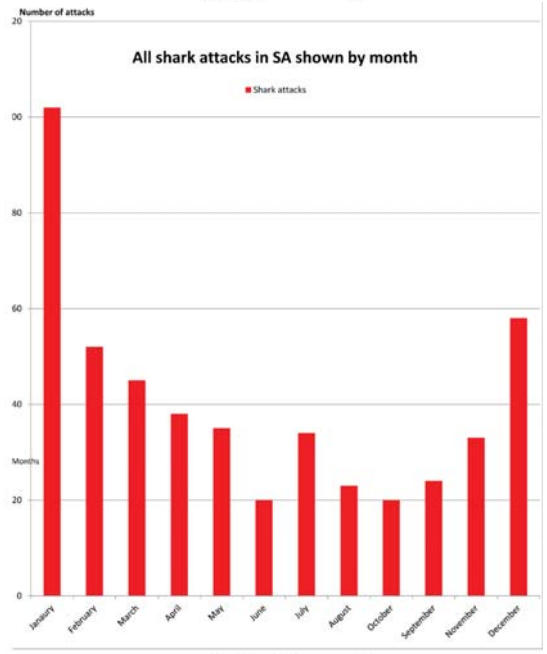
A total of 511 incidents over 98 years.

Data sourced from The Global Shark Attack File, courtesy of the Shark Research Institute. All rights reserved.





Recorded times	314
Unknown times	197
Total Attacks	511



Recorded Months	484
Unknown Months	27
Total Attacks	511

PORT NOLLOTH

ELANDSBAAI

SALDANHA

CAPE TOWN

GORDONS BAY

GAANSBAAI

CAPE AGULHAS

VICTORIA BAY

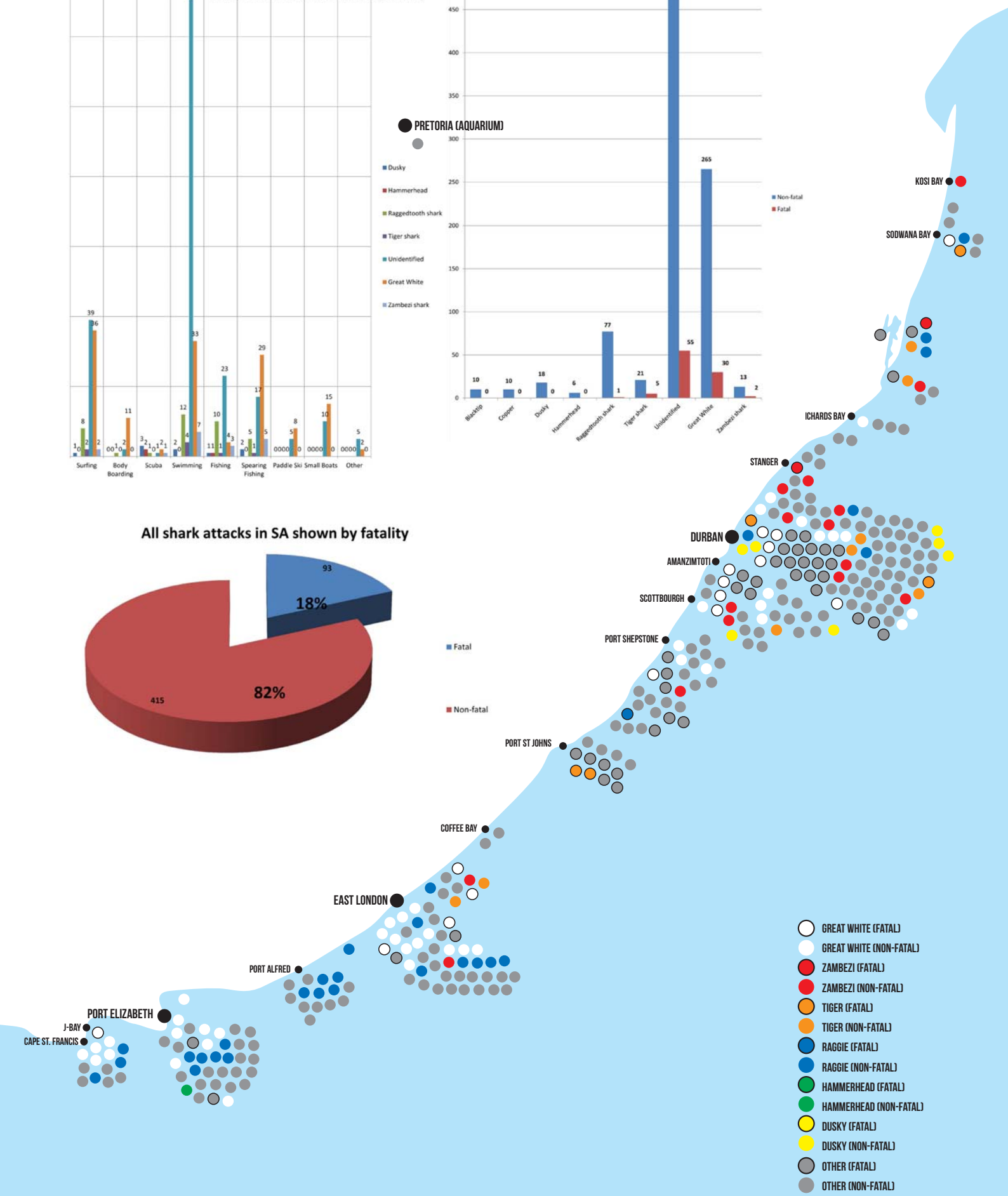
PLETTENBERG BAY

MOSSEL BAY

All shark attacks in SA shown by activity
Surfing
Body Boarding
Scuba
Swimming
Fishing
Spearing Fishing
Paddle Ski
Small Boats
Other
Dusky
Hammerhead
Raggedtooth shark
Tiger shark
Unidentified
Great White
Zambezi shark

All shark attacks in SA shown by fatality
Blacktip
Copper
Dusky
Hammerhead
Raggedtooth shark
Tiger shark
Unidentified
Great White
Zambezi shark
Non-fatal
Fatal

All shark attacks in SA shown by fatality
93
18%
82%
415
Fatal
Non-fatal


PRETORIA (AQUARIUM)
KOSI BAY
SODWANA BAY
ICHARDS BAY
STANGER
DURBAN
AMANZIMTOTI
SCOTTBOURGH
PORT SHEPSTONE
PORT ST JOHNS
COFFEE BAY
EAST LONDON
PORT ALFRED
PORT ELIZABETH
J-BAY
CAPE ST. FRANCIS
GREAT WHITE (FATAL)
GREAT WHITE (NON-FATAL)
ZAMBEZI (FATAL)
ZAMBEZI (NON-FATAL)
TIGER (FATAL)
TIGER (NON-FATAL)
RAGGIE (FATAL)
RAGGIE (NON-FATAL)
HAMMERHEAD (FATAL)
HAMMERHEAD (NON-FATAL)
DUSKY (FATAL)
DUSKY (NON-FATAL)
OTHER (FATAL)
OTHER (NON-FATAL)

As surfers we don't care if we have more chance of getting hit by lightning than being bitten by a Great White. Even if the records show there's only an average of three Great White attacks per year along our coastline, and of those only 40% are on surfers, the fact is that none of us want to be one those unlucky three.

Despite the stats not currently showing an increasing trend in attacks, that doesn't mean it can't change in future. Understandably we want to know what influence cage diving and chumming has on the White's behaviour. What's happening now could influence both us and future generations of surfers, as sharks can live upward of 30 years.

Hey Chummy....

A heated debate rages over whether shark ecotourism aka shark cage-diving, alters shark behaviour and increases the propensity for human/White shark encounters. The local shark cage-diving industry began in 1991, the same year that the Great White became a protected species.

Much of the debate centres on their use of chum to attract sharks, the argument being that this is conditioning sharks to associate us with food.

It seems to makes sense at first: Pavlov rings the bell, feeds the dog; dog learns bell means food. Cage-diving boat dumps chum, shark goes to boat, eats bait; shark learns boat means food. To a degree the science supports that.

Some international and local studies have shown that chumming can change Great White shark behaviour, although a study conducted on the Great Whites in False Bay found no such evidence of conditioning. There was however some evidence of conditioning in four sharks in a Mossel Bay study, but this was considered the exception rather than the rule.

Dr Matt Dicken, PE-based marine biologist and shark researcher, explains "To evoke Pavlovian conditioning in Great Whites requires the equivalent of the 'perfect storm'. You have to repeatedly feed the same shark every day for a prolonged period. There has to be that predictable reward. But the majority of Great Whites are transient in nature, often staying in an area for just one or two weeks before moving off and returning at a later date. It's not often we'll see the same individual on a number of consecutive days, so the opportunity to develop a Pavlovian response would be rare."

Matt adds that even if conditioning does occur, if it isn't maintained by regular positive reinforcement; it will eventually be lost.

A recent Australian study in the Neptune Islands showed a more noticeable effect of chumming on White shark behaviour. The researchers found that although the actual number of sharks didn't increase, they were staying for longer periods of time and that each individual was seen more often.

Care must be taken in extrapolating these results to our local situation as there's a noticeable difference in the number of days the Neptune Island sharks were getting chummed – 278 days/year compared to the 50-80 days/year in False Bay by the three tour operators. However, further research might be needed at Gansbaai, where eight operators chum the waters for nearly 300 days a year.

Despite studies that show chumming can change sharks behaviour, there's no evidence to suggest that these changes are harmful to the sharks (or us) or whether they lead to behaviour changes at other locations.

So does shark cage diving increase our risk of attack?

As a study on South Africa's White Shark cage-diving industry points out: "Would a White shark conditioned to associate a 40-foot chumming boat and cage have this conditioned reflex stimulated by the detection of a six-foot swimmer or board rider?" It's a valid point.

They refer to "Rearrangement Gradients", which basically predicts that the bigger the difference from the conditioned stimuli (in this case the cage diving boat), the less the stimulation of the conditioned response (attempted feeding).

In other words, the conditioned "feeding anticipation" response of the shark is less likely to be evoked by anything that doesn't closely resemble the cage diving boat. So the less it resembles the boat, the less likelihood of association. Personally, I don't think we look much like a boat.

There's concern around an apparent increase in the number of attacks around the Greater Cape Town area. Despite no statistical evidence of an upward trend from 1990 to October 2011, there were more attacks in the 2000-2009 decade (6) than the 1990-1999 period (12). However, before we quickly point to this as evidence of increasing attacks, consider that there were 10 attacks in the 1980s.

When the shark is drawn to the cage-diving boat, it's seeing one big picture. That's big boat, plus smaller cage, plus even smaller people inside the cage. Its association is with the entire picture, not just one small piece of it, meaning us. So when cruising the coast and spotting a human – one with no boat, no cage and no chum – basically no resemblance to the cage-diving situation, it's unlikely to deconstruct the entire chumming/boat/cage/human vision, see the minor element of that picture (us), and go "Ah, food!". It just doesn't stack up.

We don't smell much like a chumming boat either, and smell is the primary sensory stimulus that entices the shark to the cage-diving boat to start with. Sharks smell better than they see. So they smell the chum first, and then head over to check out the boat.

Thus a similarity in both smell and appearance is required for a conditioned shark to associate a new object (a surfer for instance) with a cage-diving boat and have its anticipated feeding response evoked.

I think it's safe to conclude we don't tick either the "sight" or the "smell" box, and can discard the notion that there's a direct causal relationship between chumming and human/shark encounters – in other words, the shark doesn't see us and think "Food!"

But that doesn't necessarily let cage-diving off the hook. If it keeps sharks in the area for longer, and this area's close to where we surf, it's plausible that our exposure to these sharks could increase, and with that the potential for an investigative encounter. So an indirect relationship between cage-diving and increasing human/shark encounters can't be crossed of the list yet.

Thus the location of the cage-diving operations could be a key element to consider in this debate. Although chumming doesn't draw more sharks into the area, it does create a focal point and makes them hang around longer. And if surf spots are within close proximity, would it be unreasonable to assume that our paths might cross more often?

Upsetting the balance

Safety aside, if chumming causes sharks' behaviour to change this could cascade down the entire ecosystem by changing its interaction with other species, with potentially detrimental consequences. Understanding the impacts of such change is complex because each shark is only a transient resident to these locations, and only exposed to chumming whilst there.

"I instinctively feel that chumming is wrong, especially from an environmental angle - enticing wild animals with blood for the pleasure of humans with cameras doesn't ring well with me." Conn Bertish

How to reduce the impact of cage-diving on both sharks and the ecosystem whilst maintaining a viable industry that contributes significantly to the local economy is a challenge, especially as ethical cage-diving provides a platform for Great White shark education, research and conservation.

There's too much money involved for a ban on cage-diving to ever succeed. But it can be done more responsibly; so what's the sustainable way forward?

Surfers for Responsible Cage Diving are working on a White Paper to amend a few key lines of legislation that make cage-dive operations more resposnible. It centres on the appointment of an independent Environmental Compliance Officer (ECO) for each boat, who'll ensure that regulations are followed.

Reducing the level of chumming, and the number of days per year it's permitted may help reduce the likelihood of conditioning responses. Less exposure, less stimuli, less regularly means a lower chance of conditioning.

There's also anecdotal evidence of sharks being attracted by low frequency sound, so a non-chum alternative may be possible.

Where's home?

Understanding Great White shark demographics and distribution is integral to establishing our potential risk profile. Knowing when and where they're most likely to occur gives us a better chance of minimising an encounter.

White sharks aren't home-bodies, they're travellers. They swim the oceanic equivalent of the N2 from Cape Town to Richard's Bay and beyond, even making transcontinental journeys to Australia and back.

There are key places where they spend most of their time and then they move rapidly between these areas once they decide to change location. These "hotspots" are likely related to feeding, resting, mating and socialising.

A key hotspot for Great Whites is seal colonies. Seal, Dyer and Bird Islands are the McDonald's drive-throughs of the oceanic highway, with seal-burgers topping the menu. Bigger seal colonies generally mean an up-size in the shark population within the vicinity. It's no coincidence that many of the Great White shark attacks occur within the general area of seal colonies. More sharks in an area means a higher chance of bumping into one.

Adult sharks frequent the colonies between May and November, just as seal pups start making their

first forays into the sea. That's probably why there's an increase in shark attacks over the winter months; pity it's at the same time as our best surf.

Juveniles are commonly encountered in inshore areas, often on open-coast beaches, where food is plentiful in summer. Their teeth have to mature before they can upgrade from eating fish to include seal pups in their diet.

Variables such as season, water temperature and clarity, barometric pressure and wind direction could affect where and when they move, rest, hunt or patrol. The only way to evaluate these parameters is though tagging and monitoring. The more tags and listening stations, the more we'll know.

As Matt says: "So much of our fear surrounding sharks is exacerbated by how little we know about them. Research into where they spend their time, and when, is critical to minimising our chances of getting bitten."

He spearheads a ground-breaking shark research project in Algoa Bay. Beach manager Fernando Cain wants to establish a "shark-risk" profile for the bay's popular beaches. With funding from the NMBM he enlisted Matt to establish 20 acoustic listening stations along a 40km stretch of coast. Matt plans to tag 20 Great Whites, starting in December. Monitoring these sharks over time should give us unique insight into their behaviour and where they travel.

False Bay listening stations are currently out for upgrading and will be deployed early next year together with new ones along the Atlantic seaboard. Tagging projects aren't simple. Data might only be collected once or twice a year, and takes time to process. Alison Kock is doing her PhD on the results obtained from the 78 sharks she's tagged in the Cape Town area since 2004. We're all so keen to know the results that they might make the Sunday Times best-seller list when they're published!

Ultimately, if surfers want specific information within specific timeframes, the best way to do this is to fund our own tagging projects. Simply put, if we're paying, the researchers work for us, and the results come according to our timelines. Maybe we need to put our money where our mouth is and stop expecting everyone else to assume responsibility for our safety.

Are we on the menu?

No. The high-caloric, energy-rich blubber of seal pups gives sharks far more bang for their buck. We didn't evolve alongside the shark as ocean dwellers, so don't slot into their natural food chain at all.

If they wanted to eat us there'd be far more than 63 human/White shark encounters over two decades, so it's safe to say they don't hunt us as natural prey.

So why do we get bitten then? Turns out sharks are exceedingly curious, but in the absence of hands to pick something up and give it the once over, they rely on their mouths instead. This might explain why over 70% of Great White bites on humans are bite-and-release only.

Great Whites are generally surface feeders, so surfers occupy the same zone as their usual prey. Much of the time the shark just wants to see what we are, and on discovering we don't taste particularly nice, spits us out and moves on. Unfortunately having numerous large arteries close to the surface means we don't respond well to all those razor-sharp teeth.

That's not to say that there aren't instances where victims get eaten, but these're the exception, not the rule. The majority of White Shark attacks on humans are motivated by investigation rather than predation.

How do we avoid being "investigated"?

Great Whites' olfactory bulbs comprise 18% of their total brain mass. That's a nose of note. Cruising along in a relatively "smell-free" environment and suddenly picking up a whiff of something means it's going to head over and investigate.

Obviously sitting in the line-up whilst you're bleeding isn't a good idea. How about peeing? It's not an attractive substance to blood, but if it's the only smell around the sharks going to pull past for a look. And on the very odd occasion follow that up with a "feel".

Sharks are wired to pick up the smallest electrical fields, like the signal given off by a struggling fish. This isn't good news if you have a bit of "magnetic attraction" yourself. It was one of the reasons suggested for the double Great White attack on surfer Shannon Ainslie at Nahoon in 2000. There may be something to it, as he was bumped again two years later, and then 18 months after that was next to Joseph Krone when he got bitten at Jbay. Hopefully the attraction works just as well on the ladies!

What about the "yum-yum-yellow" theory?

A 1960s Navy study led everyone to believe that sharks like yellow. However, more recent research shows that Whites may be colour-blind, seeing the world in monochrome. Contrast, not colour, drives their visual acuity. Nonetheless, yellow is still a highly contrasting colour, which is why it's used on road-signs. And leave the bling on the beach; shimmery bangles and chains could glint like fish scales.

But mostly it's about when and where we surf. If it's a high-traffic shark area, chances are we might get sussed out. This is where tagging studies are invaluable, giving us a "profile" of shark behaviour at our beaches.

Entering the ocean always carries certain inherent risks, including the possibility of being attacked by a Great White. Ultimately we need to be responsible for our own safety, making calculated decisions on where and when to surf. The only way to guarantee shark-free surfing is to stick to the wave-pools.

"The explosion of social media and heightened interconnectedness means news of shark sightings extend far beyond our immediate circle of friends."

So what's going on in Cape Town?

Despite there being no statistical evidence of an upward trend in attacks within the Cape Town region over the last 22 years, local surfers report a far higher incidence of shark sightings.

And no-one really knows why. There's plenty of theories: everything from climate change, to estuary outflows, more seals meaning more food, more sharks because they're now a protected species, changes in shark distribution patterns within False Bay, chumming, more people in the water for longer periods. Most likely it's a combination of factors, some of which we may not yet have considered. We have to be careful about picking out a single factor in isolation and trying to ascribe a behaviour change to just that one variable. Science is seldom that simple. We like to connect the dots, but we can't force them to connect.

There were more attacks around Cape Town in the decade before the White became a protected species than the decade after. Although there could be more Great Whites since they became protected, no-one can accurately pinpoint numbers because tagging only started around the same time. So there isn't much in the way of a before-and-after comparison.

Alison Kock points out: "That Great Whites have always been in the Cape is without question, however, we need to remember that our oceans are dynamic ecosystems and constantly changing. We've noted inter-annual changes in the numbers of sharks using the bay, differences in arrival and departure times and differences in the amounts of time they use the bay. Reaching over 45 years old there're cycles in regional and local movement patterns which we don't fully understand yet."

In a nutshell, Great Whites inhabit a particular area at a particular time because the area itself fulfils a specific requirement, it's just our bad luck when this happens to coincide with a popular bathing beach or surf spot.

We don't know much about Great Whites and until the gaps in the research are filled, we won't be any closer to finding answers.

"We need something tangible to direct our emotions towards when we're dealing with our primordial fear of shark attack, and it's far easier to direct our ire towards something visceral like cage-diving rather than an abstract construct such an increase in the number of water-users"

The explosion of social media and heightened interconnectedness means news of shark sightings extend far beyond our immediate circle of friends. But don't just update your status, do something more purposeful too. Drop a mail about what you saw to your local shark researcher. The more information they have, the better they can start making sense of the puzzle. As concerned water-users it's up to us to contribute to that fact-finding process.

It's unlikely that researchers have any underlying bias in what they report. They're scientists, and scientists tend to base their opinions on what facts are available. Their opinions will evolve according to research.

Shark Deterrents

Nets might be effective, but they aren't the answer; the environmental costs are just too high.

Catch statistics for 2005-2009 from the KwaZulu-Natal Sharks board show an average of 591 sharks (most harmless to humans) caught per year in its nets, of which only 13% are released alive. On average there are 380 "harmless" animals (turtles, dolphins, etc) caught each year, of which 40% are released alive.

Shark detection programs such as the Shark Spotters, initiated by Greg Bertish in 2004 provide an effective early warning system and definitely play an important role in reducing encounters. However, they're only effective where local topography allows good elevation and are often reliant on only one pair of eyes. Those eyes can't be everywhere at once.

Shark repellent devices interest us as they mean we could surf in relative safety. They use magnetic, electropositive or electrical technology, as well as semiochemical repellents.

Sharks are highly sensitive to electric fields. The SharkPOD developed by the Natal Sharks Board can apparently generate a shark-repelling electrical field with a radius of up to six metres. It generates an electrical field around the wearer, projected from the unit by two electrodes that trigger unpleasant muscular spasms in the shark, repelling it.

Its effectiveness tends to be species-specific, thankfully appearing to work better on the larger

At the end of the day the perceived danger of sharks works as a gate keepers to our magnificent coastline and ensure that spots like this one do not become over crowded. © Wade Howard / ODM

predators known for their attacks on humans, such as the Great White, Zambezi, Tiger and Mako.

However, detractors argue it could inadvertently attract sharks towards the wearer. From afar the shark merely senses a change in the general electromagnetic field of the area, swimming over to investigate.

Rare earth magnets have also been shown to repel sharks – but with an effective range of only 25cm, it's a little too close for comfort. Anyhow, wearing enough magnets to effectively repel a shark would see you sunk to the bottom of the ocean. Nonetheless, research is underway to adapt this knowledge into creating an underwater "fence" of magnets along the seafloor.

There's also interesting research into the use of acoustics (high frequency sound) to repel sharks, although this is still in development. By emitting the sound of a Killer Whale, it's claimed to deter Tigers, Zambezis and Black Tips – no word on Great Whites though.

Hopefully in the not too distant future science will develop proven and practical technology to allow us to surf in safety, knowing we're safe from inquisitives sharks.

What to do if you see a shark

If you spot a shark sussing you out, try not to panic. Remember, it's an ambush predator, so it'd much rather sneak up on you without you knowing it's there. The very fact that you've spotted it already counts in your favour.

Draw your knees up onto your board and don't take your eyes off the shark, whilst trying to face straight towards it. It'll sense that you've spotted it and are checking it out, which itself might be enough for it to lose interest and swim off. Turn your back and it regains that element of surprise it's looking for.

If there're others in the water, get closer together in a group, so you'll look like a bigger object to the shark. If it does come too close for comfort, nudge it away.

Don't start paddling in until you can't see it anymore hopefully meaning it's swum off. Paddle in quickly but calmly. Splashing around like a chaotic kook isn't going to help your chances.

If it does make a go for you, do whatever you have to – punch it in the nose, poke it in the eye. It's hard to say what will piss it off versus chase it off, but sitting there doing nothing isn't going to help your cause either.

The last word

Sharks are integral cogs in our marine ecosystem and certainly deserve our respect and protection. Pull them out of the marine equation and it could collapse like a house of cards, with consequences far beyond what we can comprehend.

Modern marine coastal management stresses an ecosystem-based approach. It's not us or them, it's us and them. We just have to work out how to keep the balance right for both parties. Happy sharks and happy humans would indeed be a happy ending. But until we work out a practical way to achieve that, the sharks remain the gatekeepers of our coastline.

Expanding our knowledge through on-going research is key. You can get involved by sponsoring a tag. While an overnight solution seems unlikely, you may be able to help your grandchildren mitigate their risk of an encounter through a better understanding of shark behaviour while helping to preserve the marine ecology for future generations.

Shark attacks do happen, but they're rare. The ocean itself is much more dangerous than any shark.

For more information:

The Global Shark Attack File & Detailed Stats for all South African Incidents.
http://www.thebombsurf.com/pages/2924/shark-attack-statistics
The KZN Sharks Board
http://www.shark.co.za/
The Shark Spotters
http://sharkspotters.org.za/
The Save Our Seas Foundation
http://saveourseas.com/projects/sharkcentre_za
Carte Blanche program on Port St John's Surfers and Lifeguard
http://beta.mnet.co.za/carteblanche/Article.aspx?Id=4366&ShowId=1