

**Submission
No 73**

MANAGEMENT OF SHARKS IN NEW SOUTH WALES WATERS

Name: Mr Drew Scerbo

Date Received: 22/10/2015

To whom it may concern,

In regard to the current plans of action and probable outcomes regarding the state of shark mitigation of your region, I feel it incumbent upon me to provide some perspective and viewpoints on the matter. These are rational, logical and (most importantly) factual representations. I find it important to state it thusly as I know you require those types of information to help formulate your perspectives. I trust that you will digest this information and take it into account prior to any decision making. Yet, first I feel the need to introduce myself so you understand the background of its interpretation.

I am a marine biologist. I have an undergraduate degree in marine biology and a masters degree in biology (with emphasis on biomechanics). Formally, I have been studying sharks since 1990. Informally since 1977. Over that time, I've experienced the explosion of interest in sharks for both good and ill, which I will get to in just a minute. I have both learned and instructed shark anatomy, biomechanics, neuroscience, physiology, and many other subtopics. I have read thousands of peer-reviewed articles, non-fiction books, and published notes on these species. I have a library of hundreds of these books, I have entire external hard-drives filled with volumes of information on sharks in nearly every topic you can think of. I have consulted with colleagues, media, research facilities and documentarians about sharks. In my personal life, I am on first name bases with many of the leading scientists in the field of ichthyology and chondrichthology/elasmobranchology (study of fishes and sharks). I have written position papers on difference aspects of shark conservation, I have conducted public presentations and acted as scientific advisor for a number of non-profit organizations with sharks as their main focus. So, why all this background information? Simply put – to let you know that I know more than you do and will likely ever know about the topic of sharks. Am I the most knowledgeable expert on sharks? Certainly not, but mine is a voice you should consider as an expert opinion. Now, let's discuss some history about public perceptions of sharks.

Initially, I experienced the demonization of these fish due to public reactions to a movie and book authored by Peter Benchley back in the early 1970's. Over the course of two decades, I personally witnessed the deplorable collapse in shark populations of many species due to fear and irrational thinking. Whole subpopulations of sharks were exploited by those looking to make names for themselves as "protectors of human rights" and self-made heroes while the behavior they exhibited was nothing of the sort. They capitalized on mass fear and made fortunes off the ignorance of the public. This should be considered the "dark ages" of shark knowledge and awareness. In essence, even though there was absolutely no spike in shark incidents around this time, they were treated as a new adversary to the human condition. Basically, because they existed – they needed to be destroyed.

Conversely, this was also a time of awakening in shark science. Even though it began more in the 1960's, the 1970's began a love affair between sharks and scientists. It is also the birth of shark conservation as well, but it would not be known for another 20 years. See, as the demonization of sharks increased – a polarization introduced rational minds to the need to understand sharks. While

fishermen collected their trophies – science sought truth in the mayhem. Pioneers like Sonny Gruber, Richard Ellis, Eugenie Clark, and many more began to define the truth in these fish rather than develop ways to destroy them. As fear escalated, funding grew to protect ourselves from sharks and allowed scientists to explore the possibilities. In essence, did we really need to fear these species...or was it all a mass delusion caused by hysterical reactions to fiction. We began to demystify sharks. Experts began to pop up from all over the world. United States, European countries, South Africa and the land down under – Australia. In fact, a large part was played by a shark bite survivor, Rodney Fox, who in the 1980's demonstrated that the white shark was not much different than any other large predator. Sure they appear to act maniacal, but through a series of expeditions – Mr. Fox welcomed scientists to understand these phenomena. Over the course of 15 years, we learned so much.

We began to see that actions of sharks had purpose. They bit/bumped into cages due to electromagnetic fields. They have incredible senses that lead them to follow scent trails for many kilometers. They are social, interactive and – perhaps most astonishing, social.

This golden age of understanding sharks began and in part, Australia was leading the way. Rodney Fox was a vehicle for scientists to get up close and personal with the malevolent denizen that literally kept the public from feeling safe...even in swimming pools. This was just the beginning of the great changes to come. These included Discovery Channel's Shark Week (a huge boon for understanding sharks) and perhaps most importantly – the first ever protection for white sharks.

Australia 2002, Australia becomes the first country to legally protect white sharks in all Australian waters. This was a moment where the entire world looked at Australia with progressive pride. The enlightened nation made the benevolent decision to rise above fear and mythology to protect a species maligned throughout all of human history. Australia "humanized" the white shark because the first time ever, we saw *them* as vulnerable. I was always captivated by Australian culture, but honestly it was that announcement that made me fall in love with the country. As a scientist, I saw Australia as a new frontier for scientific literacy and wisdom. I was certainly not alone and colleagues from around the world applauded this unprecedented protection of such a vital species. All of us expected Australia to stay at the forefront of shark awareness and scientific discovery.

Upon the announcement of shark protections, I refreshed myself on the few references I had read about regarding Australia's relationship with sharks. I buried myself in the history of Australia's shark mitigation policies and the burgeoning conservation movement. I was already well versed in much of the biological diversity, population studies and regional abundance of sharks (of all species) in Australian waters...but soon I expected to see progress in the form of rescinding the exclusion nets and other invasive and destructive devices. One had to figure that if you pass protections, it should include all threats to these species. Obviously, these changes never occurred.

Skipping forward a decade – the progress made by Australia is now moving backward. I cannot explain the reversal of fortune, but looking at the shark statistics, its even more of a mystery. See, while shark incidents appeared to be on the rise...with the influx of tourism and increased population and

recreation...no increase in shark activity occurred. As a scientist, I've gone over the data and the level of incidents remains static and unchanging. Around 2008, a spate of shark incidents appeared to shake the country to its core. The birth of social media made these incidents immediately available the world over.

In 2011, shark incidents reached a pinnacle in the country's history. Even though less than 10 people were killed – these incidents frightened the nation. In hopes of understanding, scientists from all over the world wondered what changed. This led not only to scientific speculation, but sparked the rebirth of the irrational thought process. One year of unusual activity was given so much weight that wild speculation abounded and suddenly every one latched on to the idea that the protections passed less than a decade earlier had worked too well. Here is where I will add some distinct detail:

Almost every shark incident involving injury around the entire coastline of Australia's coasts are immediately blamed upon the white shark (*C. carcharias*). Despite evidence to the contrary, old habits die hard. Many of these incidents were poorly investigated (there are a number of experts I would have no problem recommending that are highest level in their field and could easily determine species from even photographs – I recommend you look into them) and a definitive culprit was hardly ever determined. In the public mind, there is only ever one suspect (retroactively placed there by the history of shark and man). In response, on multiple occasions local provinces have set out drumlines and sent out fishing crews in an attempt to find the individual shark that possibly injured the person involved.

Now, I shouldn't need to reiterate this, as it's been well documented by many scientists, but revenge killing almost never (<1%) finds the specific culprit. Scientifically, the regions are too large and sharks that make these encounters are far too migratory to allow for any chance of catching the offender. White sharks travel hundreds of miles in a day. This is not a distance as the crow flies, but a twisting-turning, meandering travel pattern. Much like you might see in some spy movie, this is the perfect way to avoid being tracked. In addition, the social aspect of sharks means that where there is one, there are always more, further decreasing the likelihood of capturing the specific shark. Irrationally, most people will not care if the exact shark is caught and the public tend to just want some sort of revenge killing – as if it sends a message to sharks that they should mind their manners. Not kidding, this is the mindset and its been verified through interviews with the average layperson. Yet, if we were to use this logic in human criminal investigation, it would never be tolerated.

Still, I understand that the public also asks that "something" be done. Yet, it's foolish to operate with such low efficiency. It wastes time, money and manpower when it could easily be avoided to begin with, but more on that later.

Setting out drumlines is as irresponsible as the outlawed bear traps of the old days. They are indiscriminant, irresponsible and ineffective at their purpose. Much like nets, they tend to capture and kill more non-targeted individuals than just about any other method. What's being done is killing any shark or similar sized organism that is hungry. Your drumlines have caught mola molas, turtles, rays, dolphins and non-targeted sharks. All are innocent of doing harm and therefore the process is (in fact)

criminal and irresponsible. They are also terribly unmonitored which increases their failure rate and the mortality of non-targeted species. In fact, there is (so far) not a single effort using drumlines that can be verified to have caught a dangerous shark. Not one, so a zero percent (0.00%) efficiency rating is being paid for with citizen money and has no effect upon increasing safety for anyone. Quite the contrary, when these drumlines catch non-targeted species, they may draw in more sharks as they are attracted to the scent, sound and splashing of struggling victims. Adding this means it's the exact opposite of being effective...it actually may endanger the public. Time to change tactics rather than insult the public by pretending any of the efforts anywhere have had any effect on public safety.

Now, I could go into alternative methods, but they are equally destructive and inefficient. Nets are worse in many regards and provide no protection. They kill even more non-targeted species and individuals. They can even trap predators in with the bathers if these sharks run the gauntlet and find a way inside (which happens more often than publicity suggests). Add to that the criminal act of entangling other protected species such as the internationally protected whales and marine mammals. Dolphins (at least 18 different species), whales (at least 12 species), pinnipeds (seals, fur seals and sea lions) of more than 20 different species, sea turtles (more than 5 species), other fish, non-dangerous sharks, rays, eels, etc. You find anything larger than 0.2m long and it can and will die in these nets.

So what is the government of Australia and local provinces to do? There are so many options that are both cost efficient and effective it boggles the mind. Shark Spotter programs, development of monitoring drones, increased medical presence, boats anchored just outside break points, aerial surveys, etc. The list is ridiculously long and all are options, however my view is two-fold and very different from what most will tell you.

First, there needs to be an increased level of personal responsibility for recreational bathers, surfers and anyone that enters the ocean. In the same way that no one can blame the local politicians for getting a sunburn, the same personal choice is made to enter coastal waters. There are incredible advancements that could keep people safer if they truly consider it a responsibility. After all, the people entering waters are not being injured as they go about their business – they are entering the wilderness. It's been said many times before, but if these folks are not willing to accept the risks, then there is no responsibility for blame but their own. It sounds cold and cruel, but when someone drowns, we don't blame the water. When someone is stung by a jellyfish, we don't sweep the area for all ocean drifters. When someone falls on the beach, we don't clear away all the sand. So why the double standard?

There are personal protection devices available for purchase. Even more in development. Certainly it's no fun to swim in a chainmail suit, but it provides protection. With a modicum of effort, we could develop lightweight Kevlar apparel that would prevent shark teeth from penetrating skin. Integrate this technology with wetsuits and we could wipe out shark incidents all together. Problem is, no one wants to take that responsibility and use those devices. It requires more forethought than just throwing on a bathing suit and running into the waves. It requires purchases. But here's the problem, if one isn't willing to protect one's self, then isn't it a lack of personal survival? People purchase flotation devices for their backyard swimming pools, but aren't willing to sacrifice a little personal comfort to avoid

possible interactions with sharks? To understand why this is, we have to look at the reasons and highest on the list is that the chances of having these encounters is SO low, that your average tourist, surfer, or citizen of any kind are not willing to prepare for it.

So how low are the chances of these encounters? Astronomically low. IN fact, at last estimate, even in areas of highest shark activity, the chance of having a physical altercation with a shark is equal to being struck by lightning twice over the course of the 2 years. It cannot be predicted and the incident of these encounters is on par with being knocked unconscious at a professional baseball game (here in the USA). Know why it doesn't happen here (?), because there are literally too few games to make the statistic valid. You would need 10x the amount of games to make it feasible to even occur once a year. Pardon me for using baseball, but the statistics are easy. 30 teams x 162 games each x 45,000 fans per game x a minimum of 36 at bats. So, in essence there are a minimum 7.8 billion chances for a fan to be hit by a baseball. Then the chance of being actually harmed by that ball would further decrease the chances. All this and it's still more likely than being injured by a shark. Take the number of people visiting these beaches x how many times they visit the beach per year x the number of sharks in the area x the impulse for human and shark to interact physically (I could go on) and the level of incident is about 1 chance in 600,000,000 at the highest.

So why do I bring this up? The chances are so low that people are not willing to take personal responsibility for these low chances of injury. Yet, the government is supposed to step in kill sharks to lower these even further? Its statistically irrelevant and not with the effort.

Yes, people get injured and some killed and those are certainly tragic. I completely understand their need to hold someone/something responsible, but we must act conscientiously. We must act fairly. We must act responsibly. The pretense of doing something which has been deemed scientifically irrelevant, insignificant and destroying local waters or wildlife is compounding the tragedy.

A far better investment of time, money and effort should be spent attempting to find acceptable and reliable solutions. Removing part of the shark population will never increase the safety of recreational users. Advancing technology and personal protection technology can.

Ultimately, accidents happen. If airplanes crash, we don't crap the flight industry. If someone is hit by an automobile, we don't ban driving. These would clearly be overreactions to unpredictable circumstances.

Human life IS precious, but taking more life is never a solution. Protecting life can be accomplished much more easily than failed and antiquated methodology. It's never worked, will never work and is way below the integrity of your country. Wildlife is not subject to the laws of our society. They should not be treated as such and any court in the world would never allow retribution without due process. The idea of killing members of a species for simply acting naturally in their own habitat is not only scientifically unsound, but unethical as well. These people, despite their intentions, entered a wilderness and met with accidents. Treat it as such. When someone is killed in their own swimming

pool by an invading predator, then (and only then) is there cause for pre-emptive culling. Just don't hold your breath waiting for it to occur.

Stay at the forefront of ecological progress. Don't act rashly. More than 70% of your population thinks enacting a cull (even a targeted and limited cull) is wrong. Be above the mistakes and do not add to the wrongs already committed. No good can come from this and I say this as a person, a conservationist and a scientist.

Vote to suspend, prevent and outlaw any cull of marine life.

Sincerely,

Drew Scerbo, MSc.