

Submission to the Senate Standing Committee on  
shark mitigation and deterrent measures

Shark quota trading scheme

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## Personal background

I have been surfing the Northern Rivers Region for forty years and have been living in Ballina for fifteen years. Over the past two years, I have had numerous close encounters with sharks, including two occasions of being in the surf at the time of an attack, one of which occurred just five metres away from me.

## Summary

My submission is divided into three parts:

- Estimating the risk,
- Appreciating the dilemma, and
- Settling the debate.

The purpose of section one is to eliminate any doubt about the elevated risk of shark attack, so the reader appreciates that our fear of attack is justified. The next section invites the reader to focus on the problem in terms of its ethical implications, rather than being distracted by arguments that avoid responsibility. The last section presents a novel solution to the problem, by engaging market forces to balance the wishes of two diametrically opposed interests.

## Estimating the risk

On the 70km stretch of coast between Byron Bay and Evans Head, there have been 13 shark attacks since September 2014: an average rate of one shark attack every nine weeks. Eight of those attacks occurred within 12 kilometres of Ballina; four of which occurred within one kilometre of the river mouth.

Despite the high concentration of shark attacks, some people insist that the risk is still extremely low. You might hear, for example, that many more people die on the roads. But, it is not appropriate to compare the rate of shark attacks with the national road toll because practically everyone is at risk of being in a car accident, while very few people are exposed to the risk of shark attack.

Unfortunately, we do not have reliable figures of how many people surf in Australia. But, if we say that 1% of the population surfs, then the national average of two shark attack deaths per year would be equivalent to 200 deaths, relative to the entire population. While this compares favourably with the road toll, which was almost 1,300 last year, the risk of shark attack is not evenly distributed throughout the surfing population: it varies depending on which stretch of coastline is surfed and how long each surfer spends in the water.

As for time spent in the water, this obviously varies a lot from surfer to surfer, but if we apply the 80/20 rule to, say, 2% of Ballina's total population of 40,000 (800 surfers), approx. 160 surfers (20%) would account for 80% of the total time spent surfing. On the basis of exposure, we can then match this subset of 160 surfers with  $0.8 \times 4$  attacks per year, which elevates the risk of shark attack for these surfers to  $3.2/160$ , or 2%. Since 3 of the area's 14 shark attacks since 2008 were fatal, the risk of being killed by a shark would be almost 0.5%. There would still be variation within this group, so the risk to some could easily be double the average, approaching 1% for death and 3% for injury.

Another way to calculate the risk of shark attack is to consider the total number of hours spent in the water. I would estimate that over the past two years, about 200 days of the year produced surfable conditions at Ballina's Lighthouse Beach and Shelly Beach, with a total average of about 200 hours spent in the water each day of surf. Since there have been four attacks in two years, the risk would be about 1:20,000 for every hour spent in the water ( $200 \times 200 / 2$ ). The longer you spend in the water, the greater the risk; so if you spend an average of one hour in the water each day, the risk of being attacked in the course of a year would be about one percent (assuming that it makes sense to extrapolate from these figures alone).

So, you really can't conclude that driving to Lighthouse Beach is more dangerous than surfing there. Sure, more people die on the nation's roads. But, there are so many cars on the road, all day and every day, that the risk of dying in a car accident is a tiny fraction of the risk of shark attack in Ballina. Imagine if tens of thousands of people died on the roads each year. Ponder that for a moment and you will get a sense of how it feels to surf around Ballina.

## Appreciating the dilemma

Ethics is about taking responsibility for a predicament. The problem with claiming that more people die this way and that is that it avoids responsibility. There are numerous arguments that take this approach, which basically ridicules the problem, e.g. "The sea is the shark's domain", "If you're so afraid, don't go in the water", etc. Some people even blame the victim. But, we must not place all responsibility on the individual, because the community is morally bound to take responsibility for younger people, who are notorious risk-takers. Besides, shark attacks impact a lot of people, not just the victims. Families suffer the loss of a loved one. Witnesses are traumatised for months, sometimes years. And the broader community feels anxious every time an ambulance can be heard anywhere near the beach.

At the heart of this debate is the question of moral status. Is it morally permissible to kill sea creatures so that humans can enjoy the ocean without fear of attack? Or do sea creatures have a moral right to live, even if humans occasionally fall victim to shark attack? It is an ethical dilemma, which can be explained in terms of the doctrine (or principle) of double effect, according to which it may be morally permissible to protect sharks if the suffering caused by shark attacks is proportional to the benefit of protecting them.

Unfortunately, there is no definitive answer to this question. Having followed the debate intently for two years, I don't believe either side will ever accept that they are wrong. There are perfectly reasonable arguments presented on both sides. So, the problem will likely persist for many years to come. But, if we agree that the dispute cannot be resolved within the foreseeable future, it might be worth exploring a different approach, aimed at settling the dispute in a way that could actually satisfy both sides. If this can be achieved, the benefit to the community could be profound.

## Settling the debate

It might be possible to settle the shark debate by auctioning the fate of sharks to the highest bidder. The government could hold regular auctions allowing the market to decide the fate of one shark per day. The money raised could then be used to compensate the losing side. Ideally, the funds would be invested in the needs of each community. Surfers would decide how best to protect themselves and the Greens would decide how best to protect the environment. This would relieve the government of the responsibility of having to make everyone happy, which is probably impossible in the shark debate.

Basically, the system works because people are challenged to put their money where their mouth is. I reckon the Greens would quickly lose interest in the shark debate if they had to back up their beliefs with hard cash. On the other hand, if the environmental movement is being supported by large corporations, as some have suggested, then a trading scheme could tap their wealth instead of depending on public funds to deliver costly programs that only benefit a small minority of the population.

A trading scheme would take a lot of decisions out of the government's hands. Surfers would be paying for the right to surf with fewer sharks, by funding environmental projects endorsed by the Greens. Conversely, the Greens would be paying for the right to protect sharks, by funding programs that protect surfers, but only in ways that surfers endorse. This ensures that the losing side feels compensated, by giving them the power to explore other options. After all, the Greens are fighting a war on many fronts, where funds can be put to good use, while surfers would be able to fund other measures to avoid shark attack.

Over time, the outcomes might swing back and forth, with the occasional shark attack triggering more investment in eliminating sharks. Of course, this would upset the Greens, who would respond by raising the stakes, generating more money for shark deterrents. So, apart from providing an alternative mechanism for policy decisions, a trading scheme would adjust to changing circumstances more efficiently than government deliberation.

We are all hoping that the problem goes away by itself. But, as the shark population grows alongside our own expanding population, the tragedies will probably continue with increased regularity. So, in the interest of resolving our differences, I think we should be given the opportunity to participate in regular auctions that demonstrate our commitment to either maintaining or reducing the number of sharks.