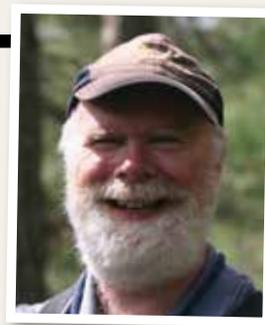


FROM OUR SOUTHERN CORRESPONDENT



Richard Hobbs / University of Western Australia

Scottish comedian Billy Connolly has a hilarious routine about coming to Australia and encountering fauna of all shapes and sizes that can bite, sting, maim and kill you. According to Billy, everything is out to get you in Australia, and it's a surprise that Australians make it to adulthood at all. Nevertheless, he also jokes about the way that, by and large, Australians take the dangerous creatures they live alongside pretty much for granted as part of the Australian environment. Indeed, serious injuries or death as a result of encounters with dangerous wildlife are relatively uncommon (particularly in comparison to things like road and workplace accidents, alcohol-related deaths and so on).

So it's perplexing to witness the situation happening currently in my home state of Western Australia, where the state government, led by Premier Colin Barnett, is implementing a policy of deploying baited drum lines 1km offshore from popular beaches with the aim of catching and killing large sharks, some of which are endangered species. This action is in response to an increase in the number of shark attacks on humans recently, and particularly seven fatalities in the last 3 years. While the prospect of being eaten by a very large fish with lots of sharp teeth is undoubtedly scary, and everyone sympathises with victims and their relatives, there is now a major grass-roots protest movement underway aimed at forcing the government to give up the baiting program.

There are many reasons to be sympathetic with this movement. One is the simple perspective of relative risk. Even the popular media picked up on the observation that shark attacks remain remarkably uncommon. The Sydney Morning Herald editorial on 4 January 2014 (www.smh.com.au) commented: "Given that millions of swimmers and surfers have taken to the waters around Australia during the past century, and given the proximity of so many sharks close to shore through that time, there have been remarkably few attacks relative

to these numbers." Relative to other risks, shark attack is pretty low on the list. In fact, a colleague from New York once told me that, in any given year, more people are bitten by New Yorkers than by sharks worldwide. I thought this was just a crazy New York joke from a crazy New York friend, but it turns out to be true. It also turns out that many more people are killed annually by, for instance, pigs or coconuts than by sharks.

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There is also evidence to suggest that many shark attacks are chance or mistake encounters – if sharks really wanted to eat us, they'd be in at the popular beaches every day during summer picking up fast-food humans (well, they'd probably actually go for the slower moving variety). Speaking of fast-food, a local fish and chip restaurant in Fremantle (not far from Little Creatures) has two wave-skis hanging from its ceiling, each with large ragged-edged holes in their middle – instances where sharks bit the equipment rather than

ate the people. Another such instance involved two lawyers paddling off Cottesloe Beach – again, the lawyers survived but their craft was chomped, prompting a long-running spate of shark – lawyer jokes.

Having said all that, the fear factor defies logic, and it's clear that rational consideration of the relative risks of being eaten by a shark – rather than, say, being run over by a truck – does not play much of a part in decision making, either at a personal or societal level. Sharks, like other big fierce things with teeth, have a place deep within the human psyche and many people – including our state Premier – appear unable to get past this. Even people who should know better get caught up in the hysteria. For instance, Barry Carbon, a former Chair of the Western Australian Environmental Protection Authority, commented in our local newspaper (The West Australian, January 4-5, 2014): "Unfortunately sharks eat people. People feel insecure because they think sharks might eat them. The consequence of this is the necessity to kill sharks that enter into restricted areas."

OK, so the first part of this statement makes sense, sort of – sharks, as we've seen, don't actually eat that many people, but people may well feel insecure because of the fear that a shark *might* eat them, however small the probability



Photo by Richard Hobbs.

of this occurring is. However, the last part of the statement is a huge leap of logic and/or faith that needs to be examined a bit more carefully. It's also been at the heart of the protests going on since the move to bait and kill sharks off WA beaches was announced. The main point of contention is that there appears to be no evidence whatsoever that baiting for and killing sharks has any effect at all on the incidence of shark attacks on humans. It's even possible that the baited drum lines actually draw sharks into areas they would normally not visit, hence potentially increasing the risk of shark attack. As every fisherman knows, for every fish that gets hooked, there are many that get away. There is, however, good evidence from other parts of the world where baiting has taken place that significant by-catch occurs and that baited areas become locally depleted of many forms of aquatic life. Indeed, a report produced for the Western Australian Fisheries Department concluded that: "Due to the environmental impacts of shark control activities, it is not recommended that either shark nets or drum-lines be introduced into Western Australia." (McPhee, 2012).

Christopher Neff, who has studied the politics of shark attacks, concluded that: "There are no simple government solutions when sharks bite people.

These rare and sometimes fatal incidents are fraught with uncertainties and command a disproportionate amount of psychological space in the minds of the public, as well as a large degree of policy space and funding from many governments." (Neff, 2012). From an ecologist's perspective, the interesting part of this story relates to the process at the top of a lot of people's minds these days – the effective meshing of science with policy. There is undoubtedly much more research needed on every aspect of the shark story. For instance, there is more hot air than light at the moment on the question of whether shark numbers are increasing or decreasing. Many shark species, especially the big relatively rare ones, are classic cases of wide-ranging mobile organisms whose numbers, movement patterns and behaviour are remarkably difficult to study effectively. So the standard scientific response that "We need more research" certainly applies here.

However, there is also a clear need for more immediate responses. In particular, as we all know from watching "Yes, Minister", the government needs to be seen to be doing something. The key aspect here is that we would all, I think, aspire to contributing to an evidence-based approach, especially if you listen to Bill Sutherland and others. And yet, the government decision in this case was

taken *despite*, rather than because of, evidence. There is no evidence that the proposed course of action will reduce the risk to humans, and it is even possible that it could increase the risk. Christopher Neff commented in the Guardian on 27 December 2013 (www.theguardian.com) about the baited drum-line proposal, "If the point is to symbolically kill a protected species for political gain then it will be successful, but if the point is to protect the public from sharks this policy will likely be a failure." However, even the political gain may be short lived if the public, social media and international response is anything to go by. At a 4000-strong rally on one of Perth's main beaches in early January, beach-goers, swimmers, divers and others voiced strong opposition to the policy. Many of the signs on display confirmed what Billy Connelly observed – that Australians are prepared to live with the remote risk of shark attack. One sign succinctly said: "It's an ecosystem, not a swimming pool".

In the meantime, other options are being implemented to reduce shark attacks. A shark-proof enclosure is being trialled at a local beach, and this was recommended as an option by the Department of Fisheries report. Regular aerial searches occur off popular city beaches during the summer months. Sharks are being tagged with transmitters that are detected by off-shore buoys and set off



Rally protesting against proposal to install baited drum-lines off popular Western Australian beaches, January 2014. Photo by Richard Hobbs.

alerts when the shark comes within a kilometre of a beach. Beach goers are now also able to get warnings on shark movements from Twitter (it seems that it's not just INTECOL meetings that have turned to Twitter for help). There are also various personal shark deterrents available, and research is underway on innovative colour designs for wetsuits and watercraft that make sharks less likely to mistake the swimmer or craft for a potential meal.

So, what's the prognosis for evidence-based environmental policy? Well, the answer partially lies, as has been often repeated, in the willingness of scientists to engage with the policy process. But it also has to rely on politicians being willing to move beyond simplistic solutions, particularly where there is no evidence these solutions will have any effect other than wasting a lot of taxpayer money. And of course, there has to be a modicum of desire to take note of the evidence that is there. This last point is becoming moot in Australia as a whole, with both state and federal governments seeking to reverse or compromise existing conservation policies and practices (Ritchie *et al.*, 2013). And, of course, we have a new federal government that has spent its first few months in power backtracking on climate change and dismantling key bodies designed to advise and act on climate issues. The Climate

Commission, set up under the previous government to provide scientific advice on climate change, was one such body to be disbanded – only to be resurrected as an independent body, the Australian Climate Council, after a swift and effective web-based crowd-funding effort showed huge popular support for the body to continue. Around the same time, our new Environment Minister Greg Hunt was in the press saying that he had looked up Wikipedia to check on whether there was a link between climate change and increased bushfire intensity (Sydney Morning Herald, 23 October 2013).

Meanwhile, 2013 was a year of climatic extremes in Australia, with many temperature records being exceeded and anomalous rainfall patterns across much of the country. I had planned not to mention the cricket, but the English cricket team certainly felt the heat this southern summer – not just from the rejuvenated Australian pace attack, but also from the bouts of hot weather that seemed to come on whenever there was a Test match – here in Perth, the hot weather started on the first day of the test and ended just after England had capitulated. An evidence-based approach might suggest that England doesn't do well in hot weather – but then again, maybe it was more to do with the Australian pace attack? No doubt further replication will help sort this out.

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