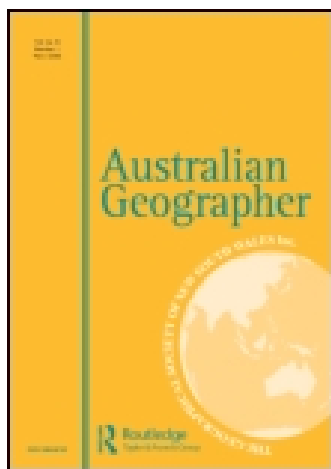


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THINKING SPACE

Killing Sharks: cultures and politics of encounter and the sea

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Australia Day 2014 began badly for sharks. The day before—25 January—lines of large baited hooks were rolled out, 1 km from the shore along some of Western Australia's most popular beaches. Within 24 hours the first shark was caught. Hauled alongside a boat, the animal was shot four times in the head with a rifle and its body dumped further offshore. It was a 3m tiger shark (*Galeocerdo cuvier*).

This act was part of a strategy established by the Western Australia (WA) government under Premier Colin Barnett. Catching and killing sharks is one component of a 'Shark Hazard Mitigation Strategy' first adopted in 2013, in response to five shark-related fatalities in WA waters in the space of 10 months. Following a further fatality in November 2013, the Barnett government announced it would begin a catch and kill program. A zone has been mapped, extending 1 km from shore along a number of popular beaches in Perth and in the state's southwest. At its edge, lines of large baited hooks, known as drum lines, are set. Within the zone—dubbed by journalists and others the 'kill zone'—sharks deemed to pose an 'imminent threat' to beachgoers are hunted and killed (ABC News 2013). Sharks caught on the drum lines or within the zone are measured: those less than 3 m are released; those 3 m or over are killed. In the first days of the program several undersize sharks were caught, some released, others found dead on the line. The contract for catching and killing sharks in WA is worth \$5700 per day (Orr 2014). The aim of this program is to reduce the risk of human injury or fatality through shark bite. But the program has seen strong public disapproval and vehement opposition from marine and ecological scientists internationally. The social sciences, arts and humanities have been less visible in the debate (with some important exceptions; see Neff 2012 and Neff & Yang 2013 on the politics of 'shark attack').

In this commentary we argue that geographers have much to offer high-profile public debates such as this one, and the broader social, cultural and political context of decision making and practice around pressing environmental issues. In particular, geographies of nature examining cultures and politics of human–non-human

interactions can shed light on attitudes, practice and politics. Here we argue, first, that cultural and political geographers can further contribute to understanding how we negotiate *troublesome encounters* between humans and the non-human world, and inform decision making by institutions and individuals that is both more effective and more ethical than present practice. Second, we argue that this series of events illuminates an area wanting of research in Australian geography: that is, geographies of the ocean. Despite the strong culture of the sea in Australia, and the high profile of ocean-related issues in the public realm, ocean spaces are under-studied by geographers. Cultural, political and economic geographers (among others) have much to offer an emerging field of ‘ocean geographies’. To begin to address these questions, we present preliminary findings from ongoing research on ocean-users and human–shark encounters, which show that people frequently encounter sharks without incident, and that ocean-users oppose management strategies that involve killing.

Catch and kill

The controversial catch and kill policy is one part of WA’s Shark Hazard Mitigation Strategy. Other elements of the \$6.85 million program include funding for ground, water and aerial beach patrol and funding for research. These elements are to be commended. But the catch and kill policy is misguided and ill-informed. The project aims to reduce the likelihood of beachgoers encountering sharks by reducing the numbers of sharks of three species in popular beach areas: white sharks (*Carcharodon carcharias*), tiger sharks (*Galeocerdo cuvier*) and bull sharks (*Carcharhinus leucas*). These species have been identified as posing most danger to humans. Given its aim to strategically target and reduce numbers of these species, the program has been described by members of the public and the scientific community as a cull.

In order to legally institute this culling program the WA government sought federal government exemption from their responsibilities to protect listed species. The three target species are identified on the IUCN Red List of Threatened Species. White sharks are listed as ‘vulnerable’—defined as ‘considered to be facing a high risk of extinction in the wild’. Tiger sharks and bull sharks are listed as ‘near threatened’—defined as ‘close to qualifying for or is likely to qualify for a threatened category in the near future’ (IUCN 2001). Permission was granted by Federal Environment Minister Greg Hunt.

Shark science and scientists

Somewhat surprisingly, given their iconic status, sharks are very poorly understood. As compared to their terrestrial counterparts (large, land-based carnivorous species), sharks remain elusive with regards to their geographic movements and migration, and their breeding. But what we do know is that several species live long and breed late. A recently published study of white sharks, for example, finds that males can live to at least 70 years (Hamady *et al.* 2014); previous work suggested a maximum figure of 23 years. Given the limited knowledge of these species, the implications of removing large (i.e. mature) individuals are uncertain. But knowledge of other large carnivores, with various habits and habitats, suggests that the implications are likely to be significant (Ripple *et al.* 2014). The WA catch and kill strategy has not been

preceded by an impact study to consider its possible effects. Nor is it supported by any scientific study to suggest it will be effective in its aims of reducing human injury or fatality. The lethal approach taken to shark management is a knee-jerk reaction rather than informed, effective environmental policy making.

Evidence from culling programs elsewhere suggests that culling sharks is not successful in its aim of reducing shark bites. In Hawai'i a series of six control programs between 1959 and 1976 killed 4668 sharks. Analysis of the programs concluded that they 'do not appear to have measurable effects on the rate of shark attacks in Hawaiian waters' (Wetherbee *et al.* 1994, p. 95; see also Holland *et al.* 1999). Recent analysis of the long-standing drum line and netting programs in Queensland (Meeuwig 2014) finds that the program, instituted in 1962, 'has taken a large toll on wildlife, while any increase in human safety has been equivocal at best'. Meeuwig (2014) has found that shark-related fatalities in the state have declined in areas both with and without drum lines, and the steepest rates of decline occurred before their installation. Further, the effectiveness of drum lines is difficult to evaluate because rates of shark bite before and after deployment are so low. Yet the high ecological cost of this project is certain, with 97 per cent of the sharks caught since 2001 at some level of conservation risk. The program has killed thousands of sharks since it began.

Large numbers of scientists are against the WA cull and have spoken and written publicly about the flaws in the strategy, including in the journal *Nature* (Cressey 2013), and in public fora such as *The Conversation* (theconversation.com). By February 2014, 42 articles about sharks had been published in *The Conversation* since the first of the recent WA fatalities, written by scholars from a range of disciplines. Articles there and on other online media sites regularly attract large numbers of comments supporting and disputing elements of the arguments put forth.

'S.O.S. Save Our Sharks'

Public response to the WA government actions has been exceptional. On 4 January 4000 people gathered at Perth's Cottesloe beach to protest against the planned use of drum lines to catch sharks. On 1 February a National Day of Action, organised by a group of institutions, saw 6000 people demonstrate at Cottesloe Beach, joined by 2000 at Manly in Sydney, and more at 11 other sites around the country. These protests are part of a new generation of political action that draws on social media to organise, distribute information, and gather support. Twitter has been used extensively to these ends (notably, through #NoWASharkCull and #NoSharkCull), as has Facebook and online petition sites such as change.org. Among the material circulating on social media and other online fora, are photographs of protestors dressed as sharks, placards proclaiming 'S.O.S. Save Our Sharks', 'Great Whites have rights', 'Stop Cullin' Barnett', and 'It's their home, not ours'. And in the mix we've heard of all manner of things more likely to kill people than sharks (notably car accidents and coconuts, and at the beach, rip currents and other drownings, rock fishing, and sand castles). By late February the Environment Protection Authority had received 'a record number' of 12 000 submissions opposing the cull (Powell 2014).

January also saw publication of a survey conducted by private company UMR Research, which found that 82 per cent of Australians (500 people surveyed) think that sharks should not be killed and that people enter the water at their own risk

(SMH 2014). Continuing research by Neff examines the politics of shark attack, and public and policy response to shark bite incidents (Neff 2012; Neff & Yang 2013). Although human–shark encounter and the recent policy changes in WA is a major environmental issue of public concern, these studies aside, there is little social science research examining the issue. Such oversight needs to change.

Ocean-users and sharks

As part of an ongoing research project, we have conducted an online survey of 557 (i.e. $n = 557$) self-defined WA ‘ocean-users’, including surfers and board-riders, divers, snorkellers, swimmers, paddlers, fishers, and Surf Life Savers.¹ This group represents the people most likely to come into contact with sharks, and focuses on the state in which the recent fatalities have occurred and policy has changed. The survey asked questions in three themes: first, about participants’ ocean use; second, attitudes and practices surrounding using the ocean given the existence of sharks; and third, views about the WA Shark Hazard Mitigation Strategy.

The survey was conducted between February and August 2013; that is after five fatalities and the announcement of the Shark Hazard Mitigation Strategy, but before the most recent policy change, including implementation of drum lines and the 1 km ‘kill zone’. In our ongoing research we continue to investigate attitudes towards these new elements of the Strategy. To publicise the survey we contacted key ocean-user groups in WA, and asked those institutions to advertise our survey on their websites and/or circulate a link to their members. Several institutions, including Surfing WA, Surf Life Saving WA, WA Undersea Club, and WA Game Fishing Association agreed to do so. The survey was then further publicised through social media and word of mouth.

Two sets of findings are particularly relevant to the current debate. These relate to the frequency of ocean-user encounter with sharks, and attitudes and practices towards ocean- and shark management. Here we describe some of our key findings.

Ocean-users frequently encounter sharks

Our results show that ocean-users regularly encounter sharks. Of those who responded to the question ($n = 511$), 69 per cent had encountered a shark while undertaking ocean activities. Of these respondents ($n = 355$) 61 per cent had encountered a shark within 1 year of completing the survey. This shows that shark encounters are common over both long- and short-term ocean-use.

The range of species encountered is very broad, and includes the three target species. Of the respondents who had encountered sharks and were able to confidently identify the species ($n = 258$), 54 per cent reported tiger sharks; 23 per cent reported white sharks; and 20 per cent reported bull sharks. These results demonstrate that people encounter sharks frequently (including the three species considered most dangerous to humans), and many encounters take place without injury or death to people.

By February 2014, 25 of the 27 sharks confirmed killed by the WA policy were tiger sharks (the other two were mako, a non-target species; individuals killed were found dead on the line) (WA Today 2014). Yet our results show that tiger sharks—and the other two target species—are encountered in WA waters frequently and without incident.

Ocean-users oppose killing sharks

We asked our respondents about their views on ocean- and shark management. We found that the majority of ocean-users are against management strategies that involve killing. We collated a list of shark management strategies suggested by the WA government, marine scientists, ocean-user groups, and the media (Table 1), and asked respondents to tell us if, and how strongly, they opposed or supported each strategy.

The most strongly opposed strategies were (in order): (1) baited drum lines; (2) culling of species identified as posing a threat to humans; (3) wider use of shark nets; and (4) track, catch and destroy policy. Methods involving killing were the least popular of all strategies proposed. The most supported strategies were: (1) improve public education about sharks; (2) encourage ocean-users to accept the risks of ocean-use; and (3) increase warning systems. The WA government's most recently adopted strategies—drum lines and culling—therefore stand in direct opposition to majority preference.

Notably, the most strongly supported strategies relate to ocean-users developing awareness of sharks and the ocean and changing their own practices. Our ongoing in-depth interviews with survey respondents are providing more detailed information about attitudes and practices associated with ocean use and with negotiating ocean use in the presence of sharks.

Human–non-human encounter and ocean geographies

From this high-profile debate we already know that scientists and the public have expressed strong opposition to the WA government's policy of killing sharks. We argue that geographers can contribute further to this and other environmental debates. In particular, in our present study we have found: first, that ocean-users regularly encounter sharks, including identified 'dangerous species', without incident; and second, ocean-users—the people most likely to encounter sharks—are opposed to killing, and support education and acceptance of risk associated with using the ocean. In the case of a poorly understood group of species and environment, these points can help stem the flow of misinformation that the presence of sharks equates to danger for people. We're continuing this work to

TABLE 1. Shark management strategies suggested by the WA government, marine scientists, ocean-user groups, and the media

-
- Proactive policy of track, catch and destroy
 - Wider use of shark nets
 - Increase warning systems for ocean-users and beachgoers
 - Develop personal shark deterrent devices
 - Wider use of baited drums lines
 - Improve public education about sharks
 - Cull shark species identified as posing a threat to humans
 - Improve signage and information at beaches about shark risk
 - Bring an end to 'chumming' waters for shark tourism
 - Increase aerial patrols over beaches
 - Encourage ocean-users to accept the risks of ocean-use
 - Increase land-based beach-patrols/'shark spotters'
-

Note: options were presented in the online survey in random order.

better understand practices associated with encounters that occur without incident. We hope that this provides impetus for public debate on related practices elsewhere in the country such as the long-standing use of drum lines in Queensland, and shark nets in Queensland and New South Wales.

More broadly—beyond the beach—geographers can contribute further to understanding human–non-human interactions, and especially hazardous, violent, or otherwise troublesome encounters. These have to date received less attention in our discipline than relations with more charismatic others such as companion species (see Lorimer 2007); sharks arguably lack such charisma. In particular, through ethnographic method cultural geographers can illuminate attitudes, knowledge and practice. Environmental and political geographers can shed light on policy, politics and governance processes associated with regulating human–non-human interaction. These and other fields of geography can contribute to public debate and decision making.

Finally, this research alerts us to the fact that oceans are under-studied in Australian geography. Despite the strong, vibrant culture of the sea in this country—and other links to the ocean through issues as diverse as ocean-based trade, fisheries, and asylum-seeker policy—Australian geography remains largely terrestrial. Yet we have much to offer an emerging field of ‘ocean geographies’ (see Bear 2013; Lehman 2013; Anderson & Peters 2014; Warren & Gibson 2014), in areas of culture(s), practice, economies and governance. The unique perspective of the discipline in Australia can contribute to negotiating ocean spaces in ways that are both effective and ethical. In the case of sharks, this involves protecting people and environments, and fulfilling our responsibility to international agreements. In other cases, different actors, politics and practices will be enrolled. Beyond human–shark encounters geographers can usefully shift from land-locked perspectives by applying our analytical tools to researching vibrant and dynamic ocean space.

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NOTE

- [1] Research is being undertaken with approval of the University of Wollongong’s Human Research Ethics Committee.

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