

**Submission
No 64**

MANAGEMENT OF SHARKS IN NEW SOUTH WALES WATERS

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Date Received: 23/10/2015



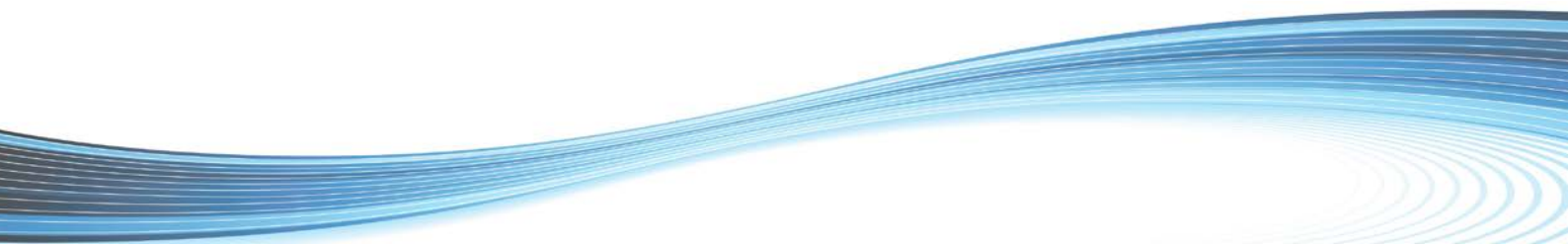
SYDNEY COASTAL COUNCILS GROUP INC.
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SUBMISSION

Inquiry into management of sharks in NSW waters

October 2015

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Introduction

Established in 1989, the Sydney Coastal Councils Group (SCCG) is a co-operative organisation that advances sustainable management of Sydney's urban coastal environment, with twenty-five years' experience in leading sustainable coastal management. The SCCG comprises fifteen Member Councils who represent over 1.4 million Sydneysiders, and is the peak NSW ROC representing coastal councils and the third largest based upon population.¹

Our Member Councils share a strong interest in mitigating shark encounters whilst minimising harm to marine animals and the marine environment. The management of sharks requires a delicate balance between maintaining public safety and providing for the conservation of a protected species. As such, the issue must be considered in the broader context of sustainable marine management. We have had a long and involved history in this area. We were strong advocates for the establishment of Intertidal Protected Areas and we formed part of the expert panel assessing and declaring Sydney's aquatic reserves. We also collaborated with the team behind Underwater Earth to produce [Underwater Sydney](#), an educational website that uses the latest technology to document and share Sydney's diverse marine life, including various shark species.

We welcome the opportunity to contribute to the Inquiry. Our submission provides general comments in relation to shark management and then specific comments on the Terms of Reference for the Inquiry, namely:

1. The impact of shark attacks on tourism and related industries
2. Changes in shark numbers, behaviour and habitat
3. Adequacy of management strategies
4. Measures to prevent attacks by sharks, including strategies adopted in other jurisdictions.

1 General Comments

We acknowledge that the management of sharks is a sensitive and politically charged issue, particularly given the recent spate of shark encounters in NSW waters. Whilst rare, encounters with sharks can be extremely traumatic for those affected. A whole-of-government approach to shark management is needed to balance conservation and public safety in the broader context of sustainable marine management. This should involve all levels of government (local, state and federal) and provide for effective and meaningful community engagement. It is also critically important that sufficient and long-term resourcing is allocated to relevant agencies in managing recreational water-based activities and the potential interaction with sharks and other marine species.

According to the International Union for the Conservation of Nature (IUCN), a quarter of the world's sharks and rays are threatened with extinction.² Sharks are an inherently vulnerable species due to their relatively long life expectancies, the time taken to reach sexual maturity and their low fertility rates.³ These figures are all the more concerning since sharks play a critically important role in the marine ecosystem as 'apex predators'. Changes in their population and distribution have corollary impacts on other marine species and may disrupt the marine ecosystem as a whole. It is therefore important that any shark management

¹ Gooding, A 2012, *A Comparative Analysis of Regional Organisations of Councils in NSW and Western Australia*, Australian Centre of Excellence for Local Government, University of Technology Sydney.

² International Union for the Conservation of Nature (IUCN) 2014, 'A quarter of sharks and rays threatened with extinction' *News Story 21 January 2014*, <<http://www.iucn.org/?14311/A-quarter-sharks-and-rays-threatened-with-extinction>>

³ Department of the Environment 2015, *Sharks in Australian Waters*, <<https://www.environment.gov.au/marine/marine-species/sharks>>

strategies consider the role of sharks in the ecosystem, and that the Federal Government play a leadership role in responding to issues and concerns. The Federal Government is also best-placed to broker international engagement in the development of management measures to ensure global conservation of shark species.

Recommendations

- 1.1 Promote a whole-of-government approach to shark management to balance conservation and public safety in the broader context of sustainable marine management.
- 1.2 Allocate sufficient and long-term resourcing to relevant agencies for implementation of management strategies.
- 1.3 Call upon the Federal Government to play a leadership role in coordinating a whole-of-government response and brokering international engagement on the issue.

2 The impact of shark attacks on tourism and related industries

It is important that the incidence of shark encounters is considered in the context of increasing beach visitation and recreation. Throughout Australia there is a trend of population growth, increasing beach visitation, a rise in the popularity of water-based recreational activities and people accessing previously isolated coastal areas.⁴ For example, Surf Life Saving Australia recorded a 20 per cent increase in beach visitation between 2008 and 2009 alone.⁵ These trends may have given rise to an increase in shark encounters as well as a perceived increase in risk of shark attack. However, at this stage, there is no concrete evidence that sharks are impacting on tourism and related industries. Nonetheless, the perceived risk of shark attack may have the potential to adversely impact on Australia's tourism industry in the short-term.

It is important that educational materials appropriately target tourists and visitors who may be less familiar with the risks of shark encounters. For this reason, tourism bodies and related industries should be engaged in the development of ethical and appropriate management strategies.

Recommendations

- 2.1 Engage tourism bodies and affected industries in the development of ethical and appropriate management strategies.
- 2.2 Ensure educational materials appropriately target tourists and visitors.

3 Changes in shark numbers, behaviour and habitat

Despite large research efforts, both locally and internationally, there is still a great deal of uncertainty about shark numbers, behaviour and habitat. It also appears that some management strategies are contrary to, or not informed by, the best available information. As such, a review of existing local and international research should be undertaken to inform appropriate management strategies and identify research gaps.

New research efforts should focus on the behaviours and movements of target species so that tailored management efforts can be developed - namely for the White Shark, Tiger Shark and Bull Shark. Further research into how environmental factors influence shark

⁴ West, J G 2011, 'Changing patterns of shark attacks in Australian waters', *Marine and Freshwater Research*, vol. 62, p. 744.

⁵ Surf Life Saving Australia 2010, 'An Update on beach and aquatic safety', *Beachsafe Newsletter*, Issue 17.

numbers and behaviour is also needed. For example, consideration of how sharks respond to changes in water quality and water temperature may assist with predicting their movements. The east coast of Australia is currently experiencing unseasonably warm waters and, with increasing climate variability, such trends may increase in the future. Understanding how such changes affect the abundance and distribution of different shark species and their prey may assist with predicting their movements.

Recommendations

- 3.1 Undertake a review of existing local and international research to inform appropriate management strategies and identify research gaps.
- 3.2 Focus new research efforts on the behaviours and movements of target species so that tailored management efforts can be developed.
- 3.3 Support further research into how environmental factors, such changes in water quality and temperature, influence shark numbers and behaviour.

4 Adequacy of management strategies

There are a suite of management strategies currently deployed to mitigate the risk of shark encounters in NSW and Australia. These include deterrence measures, detection measures, monitoring and research, and community education. Increasing research into the impacts of these strategies assists in understanding their effectiveness, however it is difficult to draw conclusive evidence and there are legitimate concerns about the environmental impacts of certain strategies.

Of particular concern are the adverse impacts of the NSW Shark Meshing Program (SMP). The SMP is a key deterrence method employed by the NSW Government to discourage sharks from aggregating near beaches. Since the Program was introduced in Sydney in 1937, there has only been one fatality due to shark bite on a meshed beach.⁶ However the SMP is responsible for the often fatal entanglement of sharks and other marine life. In 2014-15, 189 marine animals were entangled in the nets.⁷ A large majority of those (77%) were non-target species and over 60% died as a result of the entanglement.⁸ Of those killed, 23 were protected or threatened species, including turtles, sharks and dolphins.⁹ We acknowledge the need to ensure public safety at our beaches, however we are deeply concerned about the detrimental impacts that shark meshing is having on a range of marine life, particularly critically endangered, threatened and migratory species. As such, we support the trial of alternative deterrence measures, as discussed in section 5 below.

We also note that current management strategies and research efforts are heavily focused on open beaches, with less consideration of harbour and estuarine waterways. As recreation in harbour and estuarine waters increases, a renewed focus is needed to tailor management efforts and educational materials in these areas. A common measure currently used is the installation of permanent 'exclusion nets' on harbour beaches. Councils have been proactive in the management of these nets to minimise impacts on other marine species. In some cases, the nets provide habitat for other marine life, including seahorses, as is the case in Manly, Mosman and Woollahra. In this instance there is an expectation for Councils to take on the responsibility of protecting marine life on nets that have become artificial habitat, whilst maintaining nets for the purpose of reducing risks to swimmers. This is despite the nets

⁶ http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/357438/nsw-shark-meshing-bather-protection-program.pdf

⁷ NSW Department of Primary Industries 2015, *Shark Meshing (Bather Protection) Program 2014-15 Annual Performance Report*, p. 19.

⁸ Ibid.

⁹ Ibid.

being outside of the jurisdiction of Local Government (Councils' jurisdiction ends at the mean high water mark). As such, greater resourcing and coordination between Local and State Governments is needed to support their ongoing maintenance.

Education also remains an important management strategy. The NSW SharkSmart initiative provides simple and targeted information for bathers and other water users to minimise their risk of attack. The availability of the SharkSmart application for mobile devices has greatly improved the accessibility of information and the NSW Government should continue to explore the use of other social media channels to aid ongoing dissemination. It is also important that communication is targeted to different user groups (e.g. surfers, divers, swimmers), as their activities expose them to different kinds of risk. In this regard, Local Government is well-positioned to engage with their local communities and the NSW Government should support further engagement with Councils to deliver consistent messaging that is appropriately targeted to local communities and user groups.

Recommendations:

- 4.1 Trial alternative deterrence measures that minimise impacts on marine life.
- 4.2 Tailor new management strategies and educational materials for harbour and estuarine waterways.
- 4.3 Facilitate greater resourcing and coordination between Local and State Governments to support the ongoing maintenance of exclusion nets in harbour and estuarine areas.
- 4.4 Continue to explore the use of social media to disseminate information to bathers and other water users on minimising the risk of shark attack.
- 4.5 Support further engagement with Councils to deliver consistent messaging that is appropriately targeted to local communities and user groups.

5 Measures to prevent attacks by sharks, including strategies adopted in other jurisdictions

We support the NSW Government's current review into existing and emerging technology alternatives to lethal shark mitigation measures. We recommend trials be undertaken on a regional basis to include current meshed areas, non-meshed areas and control sites at both coastal and estuarine locations. It is important that a scientifically valid number of beaches inside and outside of the meshing program zone are included in the trial. We also recommend that the trial review outcomes from the 2006 Scientific Shark Protection Summit, particularly those recommendations that have not yet been actioned.

There are a number of emerging technologies that have the potential to reduce the risk of shark attack while minimising harm to marine life. Examples include the Eco Shark barrier – a large 300mx100m fully enclosed barrier that may be deployed on surf beaches – and the Clever Buoy – developed by Optus and Google Plus using fish finder sonar technology and facial recognition software to detect sharks in the area and send a real time message via satellite to lifeguards. We also support and encourage further investigation and investment by both government and commercial partners in personal protection devices. These should focus on the needs of surfers and divers who use waters outside traditional bathing locations such as headlands and more remote areas. Investigation of such alternatives should be included in the trial.

We also support ongoing research and monitoring of shark movements. We note the CSIRO is currently researching White Sharks to establish a baseline estimate of population in Australian

waters. A national monitoring strategy will also be developed, enabling population estimates to be refined over time, and the work will contribute to the assessment of other conservation-dependent species. Such research is vital to understanding more about the behaviour of these species and developing evidence-based management strategies.

Through all of this work, we believe that a partnership between Local, State and Federal Governments is fundamental. It is equally important that the community is appropriately engaged in decision-making processes. Councils can assist to broker community participation in this regard, however it is important that there is greater transparency in the nature of risks, scientific research and direct and indirect impacts of different mitigation strategies.

Recommendations

- 5.1 Trials of non-lethal shark mitigation measures be undertaken on a regional basis to include current meshed areas, non-meshed areas and control sites at both coastal and estuarine locations.
- 5.2 Review outcomes from the 2006 Scientific Shark Protection Summit, particularly those recommendations that have not yet been actioned.
- 5.3 Future management strategies be developed in partnership with Local, State and Federal Governments.
- 5.4 Enhance transparency in the nature of risks, scientific research and direct and indirect impacts of mitigation strategies to inform community engagement in future decision-making.