SYDNEY COASTAL COUNCILS GROUP INC.

councils **caring for the coastal environment**

# SUBMISSION

# Senate Inquiry into the efficacy and regulation of shark mitigation and deterrent measures

February 2017

004-17GW

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To: Environment and Communications Reference Committees
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## Introduction

Established in 1989, the Sydney Coastal Councils Group (SCCG) is a co-operative organisation with twenty-seven years' experience in leading sustainable coastal management. The SCCG comprises eleven Member Councils who represent over 1.4 million Sydneysiders, and is the peak NSW ROC representing coastal councils.

The Sydney Coastal Councils Group Strategic Plan 2015 – 2019 sets out three guiding principles which encapsulate the core vision, mission and goals of the SCCG:

1. Restore, protect and enhance the coastal environment, its associated ecosystems, ecological and physical processes and biodiversity.
2. Facilitate the sustainable use of coastal resources, now and in the future.
3. Promote adaptive, integrated and participatory management of the coast.

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 vulnerable and protected species. As such, the issue must be considered in the broader context of sustainable marine management.

The SCCG welcomes the opportunity to contribute to the Senate Inquiry. As the focus on this inquiry is very similar to the NSW Inquiry into management of sharks in NSW waters this submission will address the Senate inquiry Terms of Reference providing summary of the key points raised within the NSW context while providing details of previous policy and management requests and recommendations the SCCG has provided to the NSW Government for more than a decade.

## 1 General Comments

The SCCG acknowledges that the management of sharks is a sensitive and politically charged issue, particularly given the recent spate of shark encounters in NSW waters and elsewhere. Whilst rare, encounters with sharks can be extremely traumatic for those affected. A whole-of-government national 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.[1] 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.[2] 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 mitigation and deterrent measures consider the role of sharks in the ecosystem as well as shark conservation strategies, and animal welfare concerns for sharks as well as non-target species.

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[1] 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>

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

**Recommendations**

- Ensure the development and implementation of shark mitigation and deterrent measures, that balance conservation of shark species, and public safety in the broader context of sustainable marine management.

- Allocate sufficient and long-term resourcing to relevant agencies to work on mitigation and deterrent measures based on good science, conservation management strategies, and research into new technologies.

- The Australian Government play a leadership role in coordinating a whole-of-government response and brokering engagement on the issue across relevant industries and the community.

## 2 SENATE INQUIRY TERMS OF REFERENCE

This submission considers each of the Inquiry's Terms of Reference.

### (a) research into 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 regional, national and international research should be undertaken to inform appropriate mitigation strategies and deterrent measures, 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 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 has been 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.

Ongoing research and monitoring of shark movements is critical. We note the CSIRO is currently researching White Sharks to establish a baseline estimate of population in Australian waters. The development of a national monitoring strategy is critical to 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 and nationally consistent strategies.

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 and deterrent measures on sharks as well as bycatch (non-target species).

**Recommendations**

- Undertake a review of existing regional and international research to inform appropriate mitigation strategies and deterrent measures, and identify research gaps.

- Focus new research efforts on the behaviours and movements of target species to better understand the target species so that tailored measures can be developed that provide public safety, whilst also ensuring overall target species welfare and conservation.

- Support further research into how environmental factors, such changes in water quality and temperature, influence shark numbers and behaviour.

## (b) the regulation of mitigation and deterrent measures under the *Environment Protection and Biodiversity Conservation Act 1999*, including exemptions from a controlled action under section 158;

The Recovery Plan for the White Shark (Carcharodon carcharias) under EPBC Act provides the key linkage to the future sustainable management of this vulnerable species.

The SCCG is concerned that that since the species listing as vulnerable under the EPBC Act on 16 July 1999 there has been little progress in understanding population dynamics within State and national waters.

The current recovery plan notes that the 2002 White Shark *(Carcharodon carcharias)* Recovery Plan, finalised in November 2008, concluded that it was not possible to determine if the white shark population in Australian waters has shown any sign of recovery (DEWHA, 2008). The 2013 Recovery Plan also notes it will remain in place until such time as the Australian population of the white shark has improved to the point at which the population no longer meets threatened species status under the EPBC Act.

The SCCG queries how this determination will be achieved without a significant increase in effort to effectively estimate population numbers or at least attempt to model population dynamics. The SCCG also questions the correlations being drawn from Shark meshing / control programs for evidence of population dynamic numbers with statements in the currently Recovery plan such as "Recent evidence from the New South Wales Shark Meshing (Bather Protection) Program suggests that white shark numbers may have stabilised over the last 30 years in that state".

The SCCG understands the significant challenges to determine trends in white shark populations as the species is widely dispersed, low density and a highly mobile apex predator. Clearly the next 5 year review of the species Recovery Plan scheduled in 2018 must aim to determine population base lines as well as to set population targets and mortality limits linked to associated management triggers. The SCCG questions the merit of any ongoing recovery planning process if basic understanding of populations is not available.

**Recommendations**

- A significant increase in effort to effectively estimate population numbers or at least attempt to model population dynamics

- The review of the current recovery plan due in 2018 must aim to determine population base lines as well as set population targets and mortality limits linked to associated management triggers (to be agreed to by all States)

## (c) the range of mitigation and deterrent measures currently in use;

There are a suite of mitigation and deterrent measures currently deployed to mitigate the risk of shark encounters in NSW and Australia. However, it is difficult to draw conclusive evidence of the effectiveness of mitigation and deterrent measures, and there are legitimate concerns about the environmental impacts of certain strategies.

Of particular concern are the adverse impacts of the Shark Meshing Program (SMP). The SMP is a key deterrent method employed by the NSW and QLD Governments 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.[3] 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.[4] A large majority of those (77%) were non-target species and over 60% died as a result of the entanglement.[5] Of those killed, 23 were protected or threatened species, including turtles, sharks and dolphins.[6] The need to ensure public safety at beaches is acknowledged, however the SCCG is extremely 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, the implementation of alternative deterrence measures (including personal deterrent measures) is preferred over the option of netting.

It is also noted that current 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 being outside of the jurisdiction of Local Government (Councils' jurisdiction ends at either the mean high or mean low 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 mitigation strategy. For example the NSW and WA SharkSmart initiatives provide simple and targeted information for bathers and other water users to minimise their risk of attack. The availability of the NSW SharkSmart application ('app') for mobile devices has also improved the accessibility of information and the State and Australian Governments 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:**

- Trial alternative deterrent measures that minimise impacts on marine life including personal devices.

- Tailor new mitigation strategies and educational materials for harbour and estuarine waterways.

- Facilitate greater resourcing and coordination between Governments to support the ongoing maintenance of exclusion nets in harbour and estuarine areas.

[3] http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/357438/nsw-shark-meshing-bather-protection-program.pdf
[4] NSW Department of Primary Industries 2015, *Shark Meshing (Bather Protection) Program 2014-15 Annual Performance Report*, p. 19.
[5] Ibid.
[6] Ibid.

- Continue to explore the use of social media to disseminate information to bathers and other water users on minimising the risk of shark attack.

- Support further engagement with State and Local Government to deliver consistent messaging that is appropriately targeted to local communities and user groups.

- Support further engagement between State Government and the Tourism Industry to develop and deliver consistent messaging to tourists/visitors.

## (d) emerging mitigation and deterrent measures;

The SCCG participated in the NSW Government's ongoing review into existing and emerging technology alternatives to lethal shark mitigation measures, and recommended that trials be undertaken on a regional basis to include current meshed areas, non-meshed areas and control sites at *both* coastal and estuarine locations.

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 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.

Further investigation and investment by both government and commercial partners in personal protection devices is also encouraged and supported. These should focus on the needs of surfers and divers (who represent the majority of shark attack victims) who use waters outside traditional bathing locations such as headlands and more remote areas. Further investigation, research as well as efficacy assessments of current available products should also be included in any future research and trialling program.

**Recommendations**

- 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.

- Future mitigation strategies be developed in partnership with Local, State and Federal Governments facilitated consistently around Australia via a national monitoring strategy.

- Enhance transparency in the nature of risks, scientific research and direct and indirect impacts of mitigation strategies and deterrent measures to inform community engagement in future decision-making.

## (e) bycatch from mitigation and deterrent measures;

In March 2016, the SCCG provided a detailed submission to the NSW Government in relation to the Five year review of the 2009 Joint Management Agreements for the NSW Shark Meshing (Bather Protection) Program (SMP) (link to full submission here).

In this submssion, the SCCG stated that while the evidence that the NSW SMP is achieving the first part of its stated aim, "to reduce the chances of shark interactions within the area of operation of the program" is questionable, there is substantial evidence that it is not meeting the second part of this aim, "whilst minimising impacts on non-target species"

The Review paper records that the ratio of non-target to target species caught in SMP nets over the past 15 years is approximately 2.6:1, and may be as high as to 5:1 (depending on month and year examined).

The NSW Scientific Committee's review of the Shark Meshing (Bather Protection) Program (SMP) 2014-15 Annual Performance Report notes "*that there continues to be more interactions reported with non-target (77%) compared to target (23%) species and suggests that the effectiveness of the SMP on target species should be weighed against the evidence of its relatively greater impact on non-target species*" (Eldridge, 2015). The SCCG understands that the Scientific Committee regularly raises ongoing concerns about the impacts of the SMP on non-target species as mortalities for protected and threatened species continue to be recorded for every year of the SMP's operation.

The SCCG acknowledges the need to promote public safety at popular beaches, but is extremely concerned about the ongoing negative impact of shark meshing programs on the wide range of non-target species, in particular (but not limited to), threatened and migratory species. As a signatory to the Convention on Biological Diversity, Australia has an international legal and moral responsibility to protect biodiversity in general and threatened species in particular in our waters. To continue to operate a program that culls numerous non-target species, some of which are threatened, is not consistent with our international obligations.

Key recommendation for the abovementioned submission of relevance to the Senate inquiry include:

- Shark mitigation strategies and deterrent measures determined must consider the role of sharks in the ecosystem and any adverse environmental impacts that nominated strategies might have on the ecosystem as a whole.

- That data on the percentage of target and non-target species caught in the SMP nets (including on shoreward side) is recorded and included in the publicly released catch reports.

- The SCCG supports the recommendation of the NSW shark meshing review paper to "increase the number of disentanglement teams along the east coast of Australia, including in the region of the SMP" (page 11). Adequate resourcing is required to sufficiently staff these (predominately) national parks teams in order to respond to all emergencies, including large whale entanglements. Incorporating trained volunteers to these teams should be further considered by state authorities with Australian government assistance.

- The use of early detection devices on SMP nets to detect the entanglement of large animals and reduce the time taken to alert and mobilise the Large Whale Disentanglement Team.

- The SCCG supports the recommendation in the NSW Review for further research into the efficacy of cetacean alarms or 'pingers' in deterring cetaceans from approaching SMP nets. The SCCG also supports the precautionary approach recommended in the Review to continue the use of cetacean alarms on SMP nets until such research is complete or viable alternatives are available. However, the SCCG also recommends that additional research is conducted into any possible negative effects of such alarms. The SCCG further recommends research into additional non-harmful methods of deterring marine mammals and other non-target species from entering SMP nets.

- The SCCG recommends a reduction in the number of days that SMP nets are deployed be reviewed to reduce the overlap between meshing days and the whale migration. This includes removal of the net during the months of September, March and April.

- It is recommended that the shark meshing program be phased out of beaches altogether, to be replaced with non-lethal methods of bather and surfer protection.

- The SCCG further recommends research into strategies, actions and/or tools that can be implemented to reduce the number of turtle entanglements in SMP nets.

**(f) alternatives to currently employed mitigation and deterrent measures, including education;**

Education remains a critically important mitigation 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 also improved the accessibility of information. State Governments with Federal assistance 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 Australian and NSW Governments should support further engagement with Councils to deliver consistent messaging that is appropriately targeted to local communities and user groups. The State and Federal Government should also engage actively with the tourism industry to develop an education package/key messaging for tourists around risk and safety whilst swimming in Australian waters.

**Recommendations:**

- Trial alternative deterrence measures that minimise impacts on marine life.

- Tailor new mitigation strategies and educational materials for harbour and estuarine waterways.

- Continue to explore the use of social media to disseminate information to bathers and other water users on minimising the risk of shark attack.

- Support further engagement with Councils to deliver consistent messaging that is appropriately targeted to local communities and user groups.

- Support further engagement of the state Government with the Tourism Industry to develop and implement an education program for tourists.

**(g) 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.[7] For example, Surf Life Saving Australia recorded a 20 per cent increase in beach visitation between 2008 and 2009 alone.[8] 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 significantly 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.

[7] West, J G 2011, 'Changing patterns of shark attacks in Australian waters', *Marine and Freshwater Research*, vol. 62, p. 744.
[8] Surf Life Saving Australia 2010, 'An Update on beach and aquatic safety', *Beachsafe Newsletter*, Issue 17.

It is important to note that the real or perceived impacts on the tourism and related industries, including economic impacts needs further investigation, and that decisions on development and deployment of shark mitigation and deterrent measures, particularly in the short-term, should not be reactive to economic impacts alone, and should consider ethical measures that balance public safety concerns, economic impacts, and shark (as well as non-target species) conservation and welfare.

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

**Recommendations**

- Engage tourism bodies and affected industries in the development of ethical and appropriate mitigation strategies.

- Ensure educational programs are developed and implemented to appropriately target tourists and visitors.

- Ensure that decision-making around appropriate mitigation and deterrent measures are based on a balance of concerns including tourist/public safety, evidence based economic impacts on industry and conservation/welfare measures.

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