

INVESTIGATION:  
**NSW SHARK  
MESHING  
PROGRAM**



JUNE 2023

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## EXECUTIVE SUMMARY

The shark mitigation strategy in New South Wales (NSW) has slowly been evolving over recent years. The introduction of Shark-Management-Alert-In-Real-Time (SMART) drumlines and shark surveillance drones has provided a glimmer of hope to those in the community who want to see the program cease its current lethal methods. But the State has been seemingly reluctant to make the final transition away from the lethal Shark Meshing Program (SMP) that still operates for eight months of the year.

This program is having a disastrous effect on the marine environment and is unwanted by local residents and councils alike. Scientific evidence and expert advice show that the SMP negatively impacts, and is an ongoing threat to, marine animals and the marine environment. In addition, there is no scientific evidence that supports the SMP as an effective strategy to keep beachgoers, swimmers, and surfers safe - with 80% of shark encounters in Sydney occurring at netted beaches<sup>1</sup>.

Due to the apparent stagnated progress in the NSW shark mitigation plans, our organisation has undertaken a thorough independent investigation into the historic and continued operation of the SMP.

The current SMP has many fundamental shortcomings that are investigated and explored in this investigation, some of those being:

- The majority of sharks caught and killed are either non-target species or too small to be considered a threat to human safety, many of which are also endangered and/or protected species.
- Many endangered and/or protected non-shark species are caught and killed such as various turtles and ray species, many of which are federally protected species listed in the EPBC Act.
- Other non-endangered yet protected species such as dolphins, seals, and whales are also caught and killed.
- Inaccurate, missing, and inconsistent reporting by shark meshing contractors, both historic and ongoing, lead to data inaccuracy. Data accuracy and integrity are vital for the accurate assessment of this program and whilst best efforts have been made to work with existing data, the lack of data integrity means impact is underreported and the precautionary principle must be applied when assessing the program's impact.

- Post-release mortality rates of animals are not made available, many of which would likely succumb to stress and injury post-release, based on visual evidence obtained.

It is clear from assessing data on shark incidents in states and countries that currently, or historically, operate some form of shark meshing/netting program, that there is no evidence of the efficacy of these programs achieving their stated purpose.

In addition, a growing number of surveys show public opinion strongly opposes shark meshing for various reasons, including its ineffectiveness, the killing of marine animals, its impact on the marine environment, and the disturbance of marine ecosystems.

Local NSW Governments also unanimously oppose the SMP. In March 2022 a unanimous resolution passed by Local Government NSW requested that the NSW Government phases out the use of shark nets. The historic motion also asks that the shark nets be replaced with a combination of alternatives that protect swimmers more effectively and do not harm marine wildlife.

Additionally, a lengthy and in-depth NSW Parliamentary Inquiry and Federal Senate Inquiry found in 2016 and 2017 respectively that lethal shark control measures should end.

This investigation covers all the above points in more detail, as well as explores other significant issues of the current SMP. The investigation concludes with key recommendations collated in Appendix 1 for the consideration of the state government. We understand that the reasoning behind the continuation of the SMP is not scientific, but rather political. We hope that this investigation can form the basis for policy changes leading to the overdue discontinuation of the current program, or if required, legal challenges of the current program.

New South Wales should be applauded for the many alternatives which have now been tried, tested, proven, and successfully implemented in NSW, however, there is no longer any valid reason why the lethal aspect of the program should continue.

The shark meshing program can and should cease immediately, and not doing so increases the extinction risk for protected and endangered species.

<sup>1</sup> [https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0003/1433469/9caae8f8c5bb0187413ec01b54fc9c09c8822ddb.pdf](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0003/1433469/9caae8f8c5bb0187413ec01b54fc9c09c8822ddb.pdf)

## 1. INTRODUCTION

The Shark Meshing Program (SMP) in New South Wales (NSW) was established in the 1930s as a response to increasing concerns about shark incidents along the state's coastline. The program aimed to protect beachgoers and reduce the risk of shark encounters, by reducing shark populations through the use of nets along selected beaches.

The history of the SMP can be traced back to a series of shark bite incidents in the 1930s. The incidents sparked public outrage and led to calls for action to prevent further shark incidents. Although with the benefit of hindsight, we can trace many of these incidents back to the dumping of offal by local slaughterhouses, which was not understood at the time, and the most suitable response with the knowledge at that time was deemed to be to reduce local shark populations with mass slaughter of sharks. On October 28th, 1937, the killing of sharks began in NSW at Bondi Beach<sup>1</sup>, and with this, the NSW government initiated the SMP, an expanded version of which is the same program still in use today.

The program involves the installation of mesh nets approximately 150 meters in length, extending 6m high from the ocean floor. The nets are designed to catch and kill sharks swimming near popular beaches, therefore reducing the shark population and in turn attempting to reduce the risk of a shark bite incident.

The SMP has caught and killed many thousands of sharks since its introduction. In the first 12 months of the program alone, approximately 1,000 sharks were taken off Sydney beaches.<sup>2</sup> Since then the program has steadily expanded geographically in 1972 and again in 1987<sup>3</sup>, and today covers 51 beaches broken up into five regions.

The SMP today primarily targets large sharks, such as white sharks, bull sharks, and tiger sharks, but approximately 90% of shark net catch is not these sharks. The program is indiscriminate in catching non-target shark species as well as countless species of harmless marine animals such as whales, dolphins, rays, and many more.

The program has faced warranted criticism and controversy from environmental groups, marine conservationists, and the public because of this indiscriminate decimation of marine life.

Supporters of the program emphasize the importance of public safety and the need to balance shark conservation efforts with the protection of beachgoers, citing a low number of fatalities at beaches with shark nets. However, it has been proven repeatedly that shark nets do not keep the public safe. The reduction in fatalities is instead attributed to other factors such as fast intervention from lifeguards and improved medical care for severe trauma.<sup>4</sup>

Despite the ongoing debates surrounding its effectiveness and ecological impact, the SMP in NSW remains a significant component of the state's approach to shark bite mitigation. It operates on numerous beaches along the coast and continues to provide a false sense of security for beachgoers and surfers.

1 <https://trove.nla.gov.au/newspaper/article/17402683> / <https://trove.nla.gov.au/newspaper/article/17420362>

2 [https://www.dpi.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0003/636537/FR24-shark-meshing.pdf](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/636537/FR24-shark-meshing.pdf)

3 [https://www.researchgate.net/publication/232957415\\_Decadal\\_trends\\_in\\_shark\\_catches\\_and\\_effort\\_from\\_the\\_New\\_South\\_Wales\\_Australia\\_Shark\\_Meshing\\_Program\\_1950-2010](https://www.researchgate.net/publication/232957415_Decadal_trends_in_shark_catches_and_effort_from_the_New_South_Wales_Australia_Shark_Meshing_Program_1950-2010)

4 <https://www.nature.com/articles/s41598-022-16950-5>

## 2. DATA INTEGRITY

We were originally blocked access to detailed Shark Meshing Program (SMP) catch data via Government Information (Public Access) Act 2009 (NSW) (GIPA Act) under application GIPA20-1157, with the supplied reasoning stating that catch information is made available in the Annual Performance Reports, as follows:

**“GIPA 20-1157 - Information publicly available**  
*The requested statistical information in scope can be located on the Departments website*  
[https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0004/856165/Report-into-the-NSW-Shark-Meshing-Program.pdf](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0004/856165/Report-into-the-NSW-Shark-Meshing-Program.pdf) for data between 1950 to 2009. Additionally,  
<https://www.sharksmart.nsw.gov.au/shark-nets> contains locations, species, and fate data from 2013 onward.”

The data provided in these Annual Performance Reports are not detailed enough to make any type of meaningful independent scientific inquiries or conduct any detailed critical analysis of the SMP.

As such, we reapplied for this data again and were eventually granted access (GIPA 22-64). Whilst eventually granted, the initial rejection shows an inclination to avoid independent inquiry into the program and must be considered actively hostile to analysis, and designed to dissuade third parties from accessing important data. It should not require two GIPA applications to access such basic information that is clearly in the public interest. After eventually gaining access to this information, we noted many cases of data inaccuracy.

By cross-referencing supplied data (GIPA 22-64), and supplied imagery (GIPA 20-1157) we have identified extremely concerning discrepancies in the data.

For example, a Little Penguin killed in a shark net was supplied as an image for 2019, however, zero are noted in the 18-19 or 19-20 catch data.

We attempted to identify the bird but were not able to from the image or by speaking with the Protected Species and Communities Branch of the Biodiversity Conservation Division of the Department of Agriculture, Water and the Environment

**“Unfortunately without the last digit (I can’t make it out either) it could be one of 10 birds. Each of the 10 birds were all banded in 2002 on one of three dates 22 OCT 2002, 29 Oct 2002 or 5 NOV 2002. The banding of these birds occurred at one of two locations: Manly Point, Sydney Harbour; or**

*Collins Beach, Spring Cove, Sydney Harbour*  
*That is about as much as I can provide without the last digit to actually individually identify the specific bird.*

*Sorry I can’t be more specific*

*Nathan Perring*  
*Migratory Species Section*  
*Protected Species and Communities Branch*  
*Biodiversity Conservation Division*  
*Department of Agriculture, Water and the Environment”*



*Images obtained under Government Information (Public Access) Act 2009 - Ref: GIPA 20-1157*

Additionally, images obtained show pregnant female sharks caught and killed that have been cut open, exposing a uterus full of pups. These pups are not included in the reported count of sharks killed, and any assessment made is done based on understated data.



*Images obtained under Government Information (Public Access) Act 2009 - Ref: GIPA 20-1157*

Data accuracy and integrity are vital for this process. Annual Trigger Point Reviews and other assessments of this program (environmental or otherwise) rely on accurate data. Given we have found the catch data is inaccurate and misleading, it cannot be relied upon.

Further, we note an almost complete absence of non-shark catch being listed in the catch data from 1950-1990. This means that historical catch data and population impacts of the program are understated, and data can once again not be relied upon.

This creates scientific uncertainty, and by applying the precautionary principle, this program is recommended to cease on this basis.

The SMP is allowed to operate due to a Joint Management Agreement (JMA) between the Department of Primary Industries (DPI) and the Environment and Heritage Group (EHG) within the Department of Environment and Heritage. The agreement outlines the roles and responsibilities of the agencies involved in the meshing program and is reviewed every five years to ensure it meets its objectives.

The 2017-2022 five-year JMA was due for review at the end of 2022. A Senior Policy Adviser to the Minister for the Environment confirmed in July 2022, that the JMA would not be rolled over and assured us that the JMA would be updated and public consultation would occur before finalisation.

In early 2023, just prior to this report being finalised, DPI advised that following the completion of the internal review, the JMA has been rolled over without amendment and without public consultation, despite the JMA not meeting its objectives. We were advised that:

“From the Department level I can tell you that a preliminary meeting was held with DPI, EHG, the Fisheries Scientific Committee (FSC) and the Threatened Species Scientific Committee (TSSC) prior to the JMA being reviewed. Numerous aspects of the JMA and Management Plan were discussed with the trigger point system being a key focus point. The JMA has been subsequently reviewed by DPI and EHG (as Parties to the Agreement) with the major outcome being that the JMA not to be amended, and trigger points need to be reviewed as part of the Management Plan.

The Management Plan controls the operational aspects of the SMP, and it is this document that DPI and EHG are in the middle of adjusting with the trigger point review system being a huge focus. DPI and EHG have been investigating alternative catch monitoring systems with the aid of internal and external biometricians. The current trigger point system will remain in place until a better system has been reviewed and endorsed by the FSC and TSSC and subsequently signed off by DPI and EHG, with other minor changes being made at the same time.

In accordance with the Fisheries Management Act, as the JMA document is not being amended/redrafted then there is no public consultation required. The Management Plan (as mentioned) is the operational document and can

be amended at any time once all Parties agree and it is endorsed by the FSC and TSSC. If you have suggestions/ideas for potential changes to the Management Plan, then perhaps provide those to the FSC and/or TSSC”

### **Shark Meshing Catch Data: 1999-2021 Initial Briefing**

The following figures are based on an initial examination of data provided by the NSW DPI regarding the catch in the shark meshing program.

Although the dataset only starts in 1950, anecdotal evidence tells us that the first decade of the program was high on catch. For the purposes of accuracy (more animals identified down to species level) and currency, only data for the last 22 years from 1999-2021 is discussed here.

This section focuses on three main areas:

1. Target and non-target sharks
2. Animals of conservation concern
3. Animals of public/tourism interest

While several animals may fit into more than one category, the category deemed most relevant is used for the sake of data organisation.

#### **1. Target and non-target sharks**

Within the 22-year period examined, a total of 3,009 sharks were caught with 2,593 (86.2%) found dead. These represent roughly 24 different species, excluding those marked as “unidentified”.

These sharks are also diverse in size, with the smallest caught being a smooth hammerhead (*Sphyrna zygaena*) measuring 25cm in length and the largest being an unidentified hammerhead species measuring 5.5m in length. It is important to note, however, that the dataset has several inconsistencies in the “size” field with no standardised units used and several missing entries.

It can be difficult to determine the true length of various animals by the data as it is unclear what is meant by certain entries. For example, a Sydney South entry from 21 February 2000, simply lists the size of a grey nurse shark (*Charcharias taurus*) as “8” with no indication of what unit of measure this refers to.

Using the unit of measure found most commonly across the rest of the dataset, this would indicate the shark was 8m long. The maximum size on record for this species is 3.3m. We assume the unit of measurement was actually feet as this would fit this species’ biological characteristics at 2.4m. The fact that units of measurement are haphazardly recorded and used inconsistently across all entries makes the information impossible to interpret accurately.

Within the 3,009 sharks caught, two major groups of sharks consistently dominate, those being Carcharhinids (whaler sharks) and the Sphyrnadae (hammerheads).

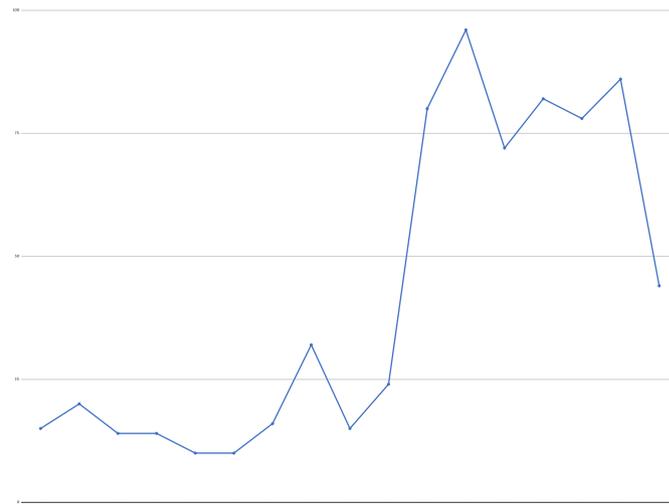
#### **Carcharhinidae**

Of the 3,009 sharks caught, 789 (26.2%) belong to the genus *Charcharinus*. These are smaller, and somewhat picturesque-looking sharks. It is a diverse group with

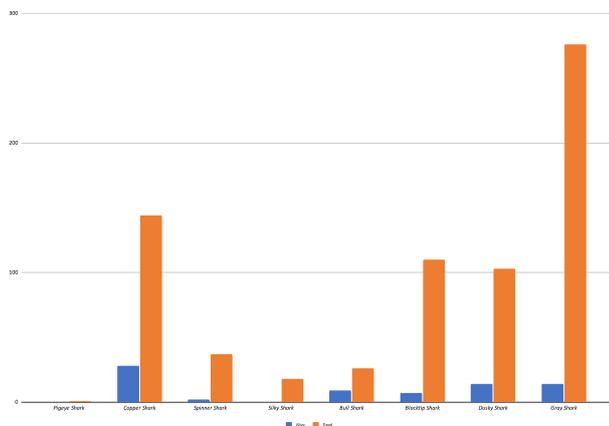
conservation statuses ranging from Least Concern to Endangered. One of the most commonly caught species is the endangered species known as the dusky shark (*C. obscurus*).

Again, this dataset is unreliable for two main reasons. Firstly, except for *C. brachyurus*, there is no attempt to identify any Charcharhinid down to the species-level before 2010. This leaves a massive gap in the data as individual species are unable to be identified.

Secondly, post-2010, the dataset only sorts this genus into seven species plus an “unidentified” category. This category is specifically unidentified Carcharhinids and is separate from the broader category of “unidentified sharks.”



Graph 2: NSW Smooth Hammerhead (*Sphyrna Zygaena*) Bycatch from 2005 - early 2021



Graph 1: Requiem Shark (*Carcharhinidae*) numbers from 1999 - 2021

NB: Full-size tables have been included in Appendix 2

### Sphyrnadae

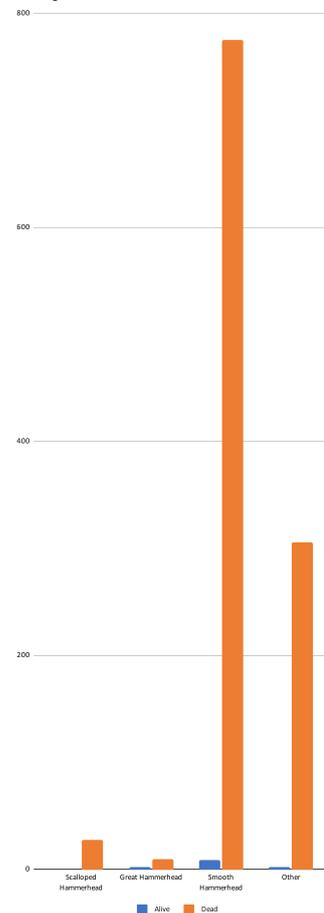
Sphyrnadae, or hammerhead sharks, are the most represented genus in the NSW shark catch data. The 1,132 individuals caught make up 37.6% of the total catch.

Of the 1,132 hammerhead sharks caught, 98.9% (1,119) were found dead due to several factors that make hammerheads more susceptible to succumbing to stress.

Identification to the species level was mandatory only after 2014, however, we are unable to evaluate how accurately contractors are able to identify to the species level.

The high numbers of all hammerhead species caught are more concerning as *S. lewini* and *S. mokarran* are now both listed as critically endangered in most Australian states. Size data indicates the removal of many juvenile sharks, which will negatively influence the prolonged population of the species.

Ultimately, the extremely high number of non-target species caught, including these hammerheads, negates any perceived metric of success from this program.



Graph 3: NSW Hammerhead (*Sphyrnadae*) numbers from 1999 - 2021

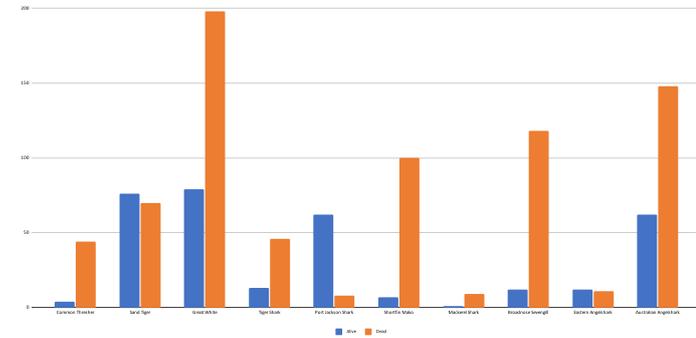
### Other sharks of concern

The bulk of the remaining sharks caught are a mix of genera and species including two target species, the great white shark (*Carcharodon carcharias*) and the tiger shark (*Galeocerdo cuvier*).

Again, an average size of 1.9m and 2.94m for great white sharks and tiger sharks respectively indicate that even though these are target species, juveniles are the

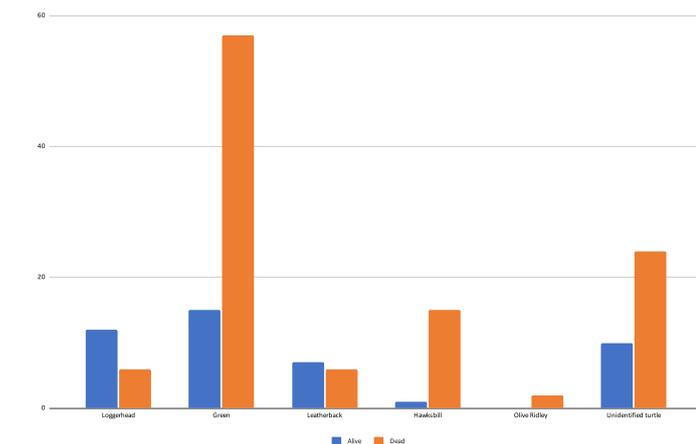
most commonly caught. Juveniles pose little threat to swimmers. Whether this is representative of the overall population or an effect of the catch method used requires further research to arrive at any conclusion.

The final species of concern is the critically endangered grey nurse shark (*Carcharias taurus*). Of the 146 caught, 70 were killed. These sharks have a high tourism value, meaning this is not only an ecological problem but an economic one.



Graph 4: NSW Misc Shark numbers from 1999 - 2021

## 2. Animals of Conservation Concern



Graph 5: NSW Sea Turtle numbers from 1999 - 2021

According to a report published in April 2022, a recent study found that Australia wiped out a genetically distinct population of southeast Australian tiger sharks before it was even known they existed. In an interview with Yahoo News<sup>1</sup>, one of the authors of the report, Dr. Alice Manuzzi from the Technical University of Denmark, said the decline appears to coincide with two factors, one of them being the introduction of shark control programs.

The rudimentary and inaccurate data gathered in the SMP makes it difficult to ascertain the program's adverse effects fully, including its impact on the now extinct south-eastern tiger shark population.

Excluding the shark species already mentioned, numerous endangered species are consistently caught and killed in shark nets. Marine turtles are commonly caught, and of the six species found in Australian waters, five have been caught in this program. The species *C. mydas* and *Eretmochelys imbricata* are endangered and

<sup>1</sup> <https://au.news.yahoo.com/australia-wipes-out-distinct-tiger-shark-population-before-discovered-041054946.html>

critically endangered respectively while other species of sea turtles are vulnerable, all with decreasing population trends.

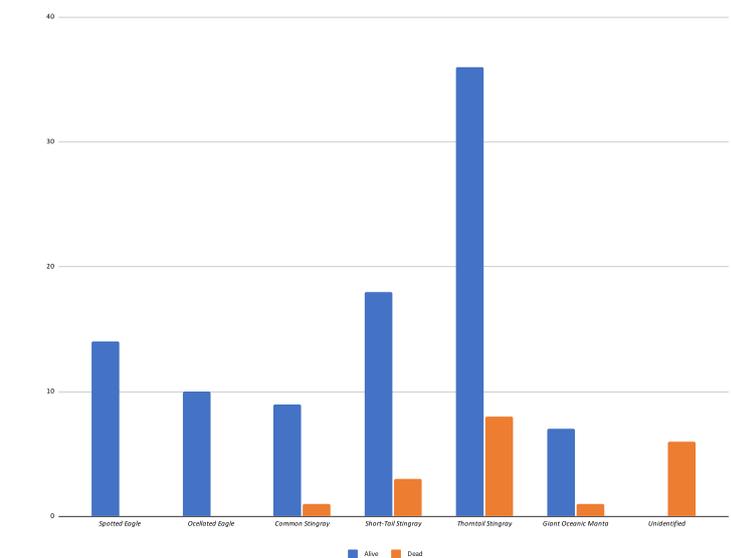
Additionally, several species of rays are caught in nets with giant manta rays (*Manta birostris*) of particular concern due to their conservation status of endangered and their high economic value from tourism.

## 3. Animals of public/tourism interest

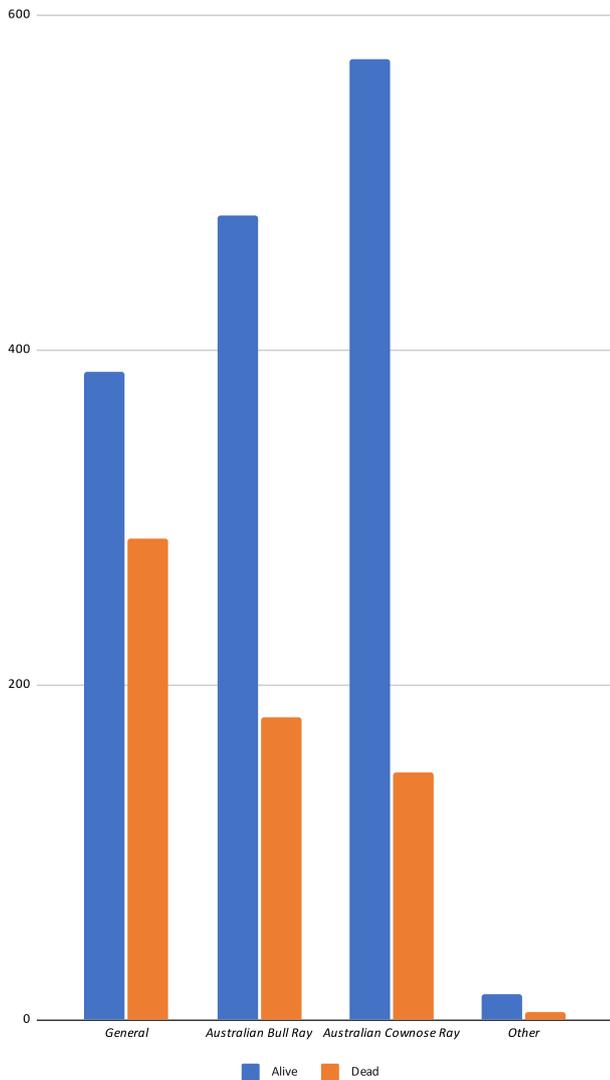
While some animals may not be of conservation concern, they still hold significant public interest due to their charismatic nature, making them a drawcard for tourism.

Rays, aside from manta rays, constitute a huge portion of the catch, with a total of 2,172 captured, and 642 (29.6%) of those were dead. Rays are of minimal risk to swimmers and are highly desired sightings by divers.

The most prominent groups caught are the Myliobatiformes (eagle rays, including *Myliobatis australis*) and *Rhinoptera neglecta*. Both of these groups exhibit schooling behaviour, which is indicated in the catch data when many are caught in close succession.



Graph 6: NSW Ray catch numbers from 2019 - 2021



Graph 7: Stingrays (*Myliobatiformes*) & Cownose Rays (*Rhinoptera*) catch numbers from 2019 - 2021

Marine mammals are also caught in these nets including whales, dolphins, and pinnipeds (seals and sea lions). Even though numbers are low compared to other taxa found in the nets, the high mortality rates and public affinity towards these animals are cause for concern.

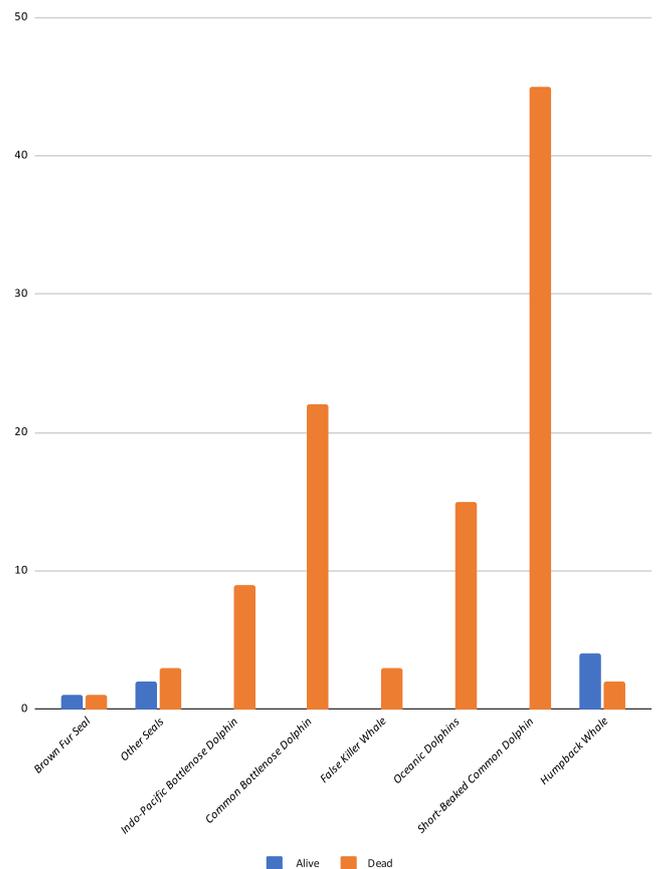
The highest mortality rate is the common dolphin with 45 killed by the nets along with 22 common bottlenose dolphins and 9 Indo-Pacific bottlenose dolphins. Of those captured, 100% were found dead, along with 15 animals only classified as Delphinidae.

As with other data, broad classifications disappear completely, in this case around 2013, and animals are

classified down to species after this point. This makes it difficult to determine the numbers of each species up until this point which were previously amalgamated into broader classifications.

Humpback whales are also present in the data which excludes several known entanglements following April 2021.

Of the six entangled whales, two were dead. It is important to note that the condition of animals being released are rarely recorded, and the numbers released alive is not an indication of their post-release chances of survival. It is thought that many will succumb due to injuries, stress, vulnerability, or other factors associated with entanglement in the nets.



Graph 8: NSW Mammal numbers from 1999 - 2021

Lastly, the SMP impacts environments outside the jurisdiction of NSW as clearly indicated by NSW shark tracking data. However, the SMP does not publicly report on any findings of this nature.

In Summary, the above analysis shows that scientific data is missing, not transparent, or likely understated. This makes it impossible to draw any substantial or accurate conclusions about the level of harm of the shark net program.

The data that is available clearly demonstrates that the level of bycatch or non-target animals entangled in shark nets is significantly higher than target animals. Also, there is no data gathered to indicate whether animals released alive survive in the longer term.

Faced with an unreliable dataset and a program that is clearly harming the marine ecology without any proven benefits, we propose that the government should move forward with a precautionary approach to<sup>2</sup>:

- cease all shark net-related activity
- explore non-lethal alternatives
- involve the public in decisions about the future of the program and alternatives, including educating the public about:
  - o existing uncertainty about the program's efficacy
  - o ecological damage the program causes
  - o non-lethal alternatives and any other options
  - o shark safety in general

The onus is on the program to show its effectiveness through accurate and reliable data, rather than continue to exist simply because it has existed for decades.

Applying the precautionary principle, the program should cease indefinitely, or at least until such time as this can be addressed.

**Recommendation 1:**

The NSW government shall take the below immediate steps, prior to further meshing seasons (if any):

- Improve reporting accuracy of catch data via independent monitoring for 100% of net checks
- Track post-release mortality via tagging and detailed reporting on post-release deaths/suspected deaths
- Conduct a thorough audit of existing datasets to, where possible, rectify all historical data accuracy errors
- Make raw data relating to the SMP's catch and kill rates since 1950 publicly accessible and downloadable to enable further independent assessment of data
- Provide transparent reporting on in-utero shark pups and other in-utero species killed
- Provide timely and transparent reporting of equipment that is dislodged, retrieved, or lost, including the circumstances and any consequences

Access to all of the above data should be publicly available and not require a GIPA application.

The current reporting accuracy issues create significant scientific uncertainty, and by applying the precautionary principle, this program is recommended to cease on this basis until this can be rectified.

*We would like to acknowledge Andrew Khalil for his assessment of the data presented in this section.*

<sup>2</sup> Kriebel D, Tickner J, Epstein P, et al. The precautionary principle in environmental science. Environ Health Perspect. 2001;109(9):871-876. doi:10.1289/ehp.01109871

### 3. BREACHES OF THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Based on the data analysed, we have identified an intensification of catch over the last two decades for many Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) listed species, which is in breach of the EPBC Act.

The NSW Government's position on its requirement to adhere to the EPBC Act when it comes to shark nets is:

*9.5 An action that has, will have or is likely to have a significant impact on matters of national environmental significance may need approval under the Environment Protection and Biodiversity Conservation Act 1999. Section 43B of the Environment Protection and Biodiversity Conservation Act 1999 provides that actions that are a lawful continuation of use of the land, sea or seabed that was occurring before 16 July 2000 are not subject to approval under the Environment Protection and Biodiversity Conservation Act 1999.*

*9.6 Approval under the Environment Protection and Biodiversity Conservation Act 1999 for the SMP was not sought in 2009 (when the first Management Plan was enacted) on the basis that the SMP was a lawful continuation of use of the land, sea or seabed and was therefore covered by the continuing use exemption in section 43B of the Environment Protection and Biodiversity Conservation Act 1999<sup>1</sup>.*

Below is an excerpt from Section 43b, which is the basis that the SMP currently operates. Bold has been added by us to highlight areas of concern.

**43B Actions which are lawful continuations of use of land etc.**

*(1) A person may take an action described in a provision of Part 3 without an approval under Part 9 for the purposes of the provision if the action is a lawful continuation of a use of land, sea or seabed that was occurring immediately before the commencement of this Act.*

*(2) However, subsection (1) does not apply to an action if:*  
*(a) before the commencement of this Act, the action was authorised by a specific environmental authorisation; and*  
*(b) at the time the action is taken, the specific environmental authorisation continues to be in force.*

*Note: In that case, section 43A applies instead.*

**(3) For the purposes of this section, neither of the following is a continuation of a use of land, sea or seabed:**

**(a) an enlargement, expansion or intensification of use;**  
**(b) either:**

*(i) any change in the location of where the use of the land, sea or seabed is occurring; or*  
*(ii) any change in the nature of the activities comprising the use;*  
*that results in a substantial increase in the impact of the use on the land, sea or seabed.*

From the data, we believe that since 2000 and the introduction of the EPBC Act there appears to be an intensification of catch in the following species:

- White Shark (513 caught in the 50 years pre-2000, 267 caught from 2000 to 2021)
- Green Turtle (0 caught in the 50 years pre-2000, 72 caught from 2000 to 2021)
- Leatherback Turtle (0 caught in the 50 years pre-2000, 13 caught from 2000 to 2021)
- Common Dolphin (4 caught in the 50 years pre-2000, 41 caught from 2000 to 2021)
- Bottlenose Dolphin (1 caught in the 50 years pre-2000, 21 caught from 2000 to 2021)
- Silky Shark (0 caught in the 50 years pre-2000, 18 caught from 2000 to 2021)
- Scalloped Hammerhead (8 caught in the 50 years pre-2000, 22 caught from 2000 to 2021)

Catch data shows a clear intensification of catch since 2000, making operating under the 43b exemption illegal. This is a serious and ongoing breach of 43b that requires the SMP to seek federal environmental approvals. These approvals should have been sought prior to intensification, or the program should have been ceased or scaled back to reduce catches to pre-2000 levels. At this point, after many years of operating in breach of the federal EPBC Act, the only tenable option is for the program to cease entirely. The program can no longer legally operate within federal law.

It is worth noting that the data shows an increased negative impact on protected species during the terms of the last two JMA's - a gross breach of these agreements. This requires termination of the current JMA for not meeting its objectives, meaning the program can no longer legally operate within NSW law.

**Recommendation 2:**

The Federal Minister for the Environment call in a review of the SMP for suspected breaches of the *Environment Protection and Biodiversity Act 1999* and to investigate the impact of the SMP on threatened and protected species, particularly migratory species.

<sup>1</sup> [https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0008/855962/management-plan-shark-meshing-program.pdf](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0008/855962/management-plan-shark-meshing-program.pdf)



Images obtained under Government Information (Public Access) Act 2009 - Ref: GIPA 20-1157



Images obtained under Government Information (Public Access) Act 2009 - Ref: GIPA 20-1157



Images obtained under Government Information (Public Access) Act 2009 - Ref: GIPA 20-1157

## 4. TRIGGER POINT INADEQUACIES

There are significant issues and technical discrepancies in the trigger points used for the management of the SMP, that do not allow for its effective, timely, and well-informed management.

The NSW government guidelines of 2022, 'Setting Trigger Points for Evidence-based Threatened Species Management', notes:

*“Triggers are not intended to be a reactionary approach to management that is implemented as a response to a decline. Trigger points, when tripped, should enable timely and pre-defined decisive actions and interventions to ensure effective management of the program.”*

Below are some key failings of the existing trigger points:

- SMP trigger points relate to the number of entanglements, not the number of animals that die as a result of entanglement.<sup>1</sup> Mortality rates of animals released 'alive' should also be measured, taken into account, and included as a trigger point
- Shark populations are decreasing, therefore the average number of catches that need to occur before a trigger point is tripped should be reduced, not staying the same or using 'exceeding' previous catch rates as a factor
- A reduction in the number of animals caught should also be a trigger point, expressed as catch per unit effort, as it may indicate that particular populations have decreased<sup>2</sup>
- The size and age of the animals caught should be considered. For example, if small sharks of the target group are being caught that do not pose a threat to people, this must be a trigger point as this is an environmental and population impact for no benefit to the beach's safety. Also if larger or breeding-age sharks are being caught this is also an issue as it impacts future populations. This is another important reason for including pups killed in the data
- The trigger point at 12.1.1 of the current Management Plan (dated 2017), should include any shark incident regardless of its seriousness, that is all bumps, bites and even minor injuries from shark bites not just 'serious' injuries. For example, bumps, bites of boards, and shark sightings from the beachside of the shark nets as these are all clear failings of the program, what the public understands shark nets to be, and the level of protection they are believed to provide. These could be verified by witnesses, including lifeguards or by other means, for example, drone footage. The presence of a shark between the beach and a shark net would mean the shark net had failed to stop the shark. Whether a shark bite is fatal or serious is irrelevant. Shark nets have no impact on the

severity of a shark bite or the shark's behaviour once it swims past the net. As it is currently worded, this trigger point is redundant

- The trigger point regarding the Annual performance report submitted to the Parties to the Agreement by 31 July each year is not adequate 'public' reporting. We believe quarterly performance reports should be made public and, for increased transparency, include primary data rather than processed data. We also recommend weekly social media updates for the community, discussed further in recommendation 11.
- The Threatened Species Scientific Committee (TSSC) was critical of the actions taken by DPI and DEH to eliminate risk to threatened species when trigger points are tripped. The TSSC stated: "We are similarly extremely concerned that there was no immediate response to the triggering of two species of turtle in this year's report; 19 green and 16 leatherback turtles. Loggerhead turtles were also caught. Nets should have been pulled immediately from the areas where catches were made to ensure no further turtles were caught, and yet this did not happen. These species cannot sustain such mortality and better management actions are required to eliminate the increased risk of extinction posed by netting."<sup>3</sup>

### **Recommendation 3:**

DPI and DEH should urgently revise the trigger points to be proactive measures with pre-defined, decisive, and timely responses when triggers trip, in line with NSW Government guidelines of 2022. These should be retrospectively applied to the past five years of the SMP, to fairly assess the damage the program is causing.

Trigger points should proactively minimise harm and should also include these basic tenets:

- Any shark incident in any meshing region must be considered a failure of the meshing program and trigger a review
- Any threatened or protected species caught in any shark meshing equipment must be considered a failure of the meshing program and trigger a review
- Any non-target species caught in any shark meshing equipment must be considered a failure of the meshing program and trigger a review
- Any lost and unrecovered shark meshing equipment must be presumed to be ghost equipment which will be left to kill wildlife for decades and must be considered a failure of the meshing program
- Any animal released alive, that perishes within 183 days (will require tracking of all released animals) must be considered a failure of the meshing program
- Timely and pre-defined actions to respond to tripped trigger points
- Regular reporting available publicly on trigger point incidents

<sup>1</sup> NSW Shark Meshing (Bather Protection) Program 2017/18 Trigger Point Review Report, [https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0008/856178/nsw-smp-201718-trigger-point-review-report.pdf](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0008/856178/nsw-smp-201718-trigger-point-review-report.pdf)

<sup>2</sup> Department of Agriculture, Water and Environment, Threatened Species Information, <https://www.awe.gov.au/environment/biodiversity/threatened/conservation-advice/carcharias-taurus#:~:text=This%20indicates%20a%20decline%20in%20the%20order%20of%2077%25%20over,substantially%20in%20East%20Coast%20waters.>

<sup>3</sup> [https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0003/1433469/9caae8f8c5bb0187413ec01b54fc9c09c8822ddb.pdf](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0003/1433469/9caae8f8c5bb0187413ec01b54fc9c09c8822ddb.pdf)

## 5. NSW PARLIAMENTARY INQUIRY FINDINGS AGAINST THE PROGRAM

Following a spike in shark-related incidents in NSW in 2015, the NSW Parliament conducted an inquiry into the management of sharks in NSW, with a particular focus on the economic impact of shark incidents.<sup>1</sup>

Although the effects on tourism were their initial focus, many submissions received during this process highlighted the effects of shark nets on marine life, leading the committee to review both issues.

The committee received a total of 81 submissions from a range of stakeholders including environmentalists, residents, and small business owners.

Following the inquiry, the committee outlayed 13 recommendations and hundreds of findings, including Recommendation 7 which states:

*“The Committee recommends that, subject to the outcome of current trials, the Department of Primary Industries move toward replacement of current shark meshing with more ecologically sustainable technologies such as the eco-barrier.”*

Concerning the impact of the SMP on marine life, the committee found:

*“5.9 The effect of the nets on marine species is well documented. For example, a 2009 report found that between 1950 and 2008, over 16,064 fish and marine mammals had been caught in the nets. The species most commonly caught in the nets were non-dangerous sharks (such as hammerhead, whaler and angel sharks and stingrays, with smaller numbers of dolphins, turtles, whales and seals.”*

*“5.10 During the 2014-15 meshing season, the Department of Primary Industries recorded 189 marine life interactions with the shark meshing. The interactions were comprised of 44 (23 percent) with ‘target sharks’ (includes bull, tiger and white sharks), and 145 interactions (77 percent) with non-target marine life. Out of the 189 reported interactions, there were 73 occasions when animals were released alive.”*

Concerning the efficacy of the program, the committee found:

*“5.27 To date, there has only been one fatality as a result of a shark attack on a beach where nets are in place. This fatality occurred at Merewether Beach in Newcastle, in 1951. However, there have also been a number of serious*

*shark-related incidents at meshed beaches. These include those where people have been bitten, resulting in sometimes serious injury, or had their surf board nudged or bitten by a shark.”*

*“5.30 - The presence of lifeguards at patrolled beaches is also a key factor in preventing shark incidents, particularly fatal incidents. For example, the Marine Ecology Research Centre observed that, ‘there is one other method that has resulted in zero fatalities over an extended period of time, one that is often overlooked: surf-lifesaving-patrolled beaches.”*

*“5.32 - Improvements in communication and medical treatment may also have played a role in preventing fatalities from shark attacks. The provision of first aid and emergency medical treatment - particularly the use of tourniquets - have reduced instances of fatal blood loss in victims. Improvements in medications, particularly antibiotics, have also reduced the likelihood of post-attack infections, resulting in fewer people succumbing to their injuries.”*

The chair’s foreword to the document also states:

*“The 13 recommendations in this report present an opportunity for Government and the community to work together. Along with a better understanding of sharks, the report’s recommendations seek to inform the community about beach safety, including awareness of sharks, and how beachgoers can make informed decisions when undertaking water based activities.”*

The negative impact of the current SMP on our marine life and local economies is clear. Since the report was released in 2016, DPI has continued to move slowly but steadily toward non-lethal alternatives as per Recommendation 7, however to date, these have supplemented shark meshing, not replaced it.

It appears that only political will is preventing the full recommendation from being implemented.

### **Recommendation 4:**

The NSW government shall utilise data gained from testing alternative methods, such as the superior target shark catch rates of SMART drumlines, and the proven ability of drones to spot target sharks, and use these methods to finally and fully comply with Recommendation 7 of the committee, ending the SMP.

<sup>1</sup> <https://www.parliament.nsw.gov.au/ladocs/inquiries/2091/Final%20Report%20-%20Management%20of%20Sharks%20in%20New%20South%20Wales%20Waters.pdf>

## 6. FEDERAL SENATE INQUIRY FINDINGS AGAINST THE PROGRAM

Since the 2017 JMA, a federal inquiry into the efficacy and regulation of shark mitigation and deterrent measures has been undertaken by the Senate Environment and Communications References Committee (Committee).

The inquiry received 78 submissions including input from scientists, state governments, community leaders, surf life saving representatives, and shark bite victims.

The inquiry handed down its report in December 2017. The report included [20 Recommendations](#) aimed at the governments of New South Wales and Queensland, as well as the Australian government.

It was the Committee's view that lethal shark control measures should end<sup>1</sup>. The Committee also made it clear that sharks are important for a healthy ocean and that the shark control programs should not continue simply because the programs predate the commencement of the EPBC Act.<sup>2</sup>

Recommendation 1 of the Committee's report states<sup>3</sup>:

*“The committee recommends that the New South Wales and Queensland Governments:*

- *immediately replace lethal drum lines with SMART drum lines; and*
- *phase out shark meshing programs and increase funding and support for the development and implementation of a wide range of non-lethal shark mitigation and deterrent measures.”*

Further support from the Committee for the removal of lethal measures includes, but is not limited to:

*“8.13 In making this observation, the committee emphasises that it wants to enhance the safety of the oceangoing public; the committee's consideration of these impacts might differ if the lethal measures were clearly effective at protecting beachgoers. However, measures that cannot be proven to have a significant positive effect on public safety but which significantly damage the environment and affect the structure of the marine ecosystem should not be permitted to remain in place. Despite Australia's international obligations to conserve migratory sharks and advances in scientific knowledge of the marine environment, including about the importance of sharks for healthy oceans, the decades-long New South Wales and Queensland*

*shark control programs continue to escape assessment under the Commonwealth's Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). This is simply because the programs predate the commencement of the Act.”*

*“8.16 In the committee's view, the use of lethal shark control measures in Australia should end. The committee acknowledges that non-lethal measures are not 100 percent effective in preventing a shark bite incident from occurring. However, the same observation applies to lethal devices. Evidence presented to the committee regarding non-lethal measures clearly indicates that new and emerging technologies can provide effective protection in many circumstances without causing the damage to the marine environment associated with nets.”*

*“8.19 The committee recommends that the New South Wales and Queensland Governments:*

- *immediately replace lethal drum lines with SMART drum lines; and*
- *phase out shark meshing programs and increase funding and support for the development and implementation of a wide range of non-lethal shark mitigation and deterrent measures.”*

The Senate inquiry report states that the Committee cannot support unproven measures that harm the environment and destabilise the structure of marine ecosystems.

### **Recommendation 5:**

The NSW government shall make publicly available the timeline and plan for phasing out the SMP. A draft plan shall be available for public consultation before 1 September 2023.

### **Recommendation 6:**

If there are delays to the implementation of Recommendation 5, the NSW government shall immediately change the standard operating practices of the SMP so that it only operates during the summer months and only during daylight hours (as per SMART drumlines), until such time as nets are phased out fully.

<sup>1</sup> The Senate, Environment and Communications References Committee, Shark mitigation and deterrent measures, December 2017, paragraph 8.16.

<sup>2</sup> Ibid, paragraph 8.13.

<sup>3</sup> Ibid, paragraph 8.19.

## 7. AUSTRALIAN NATIONAL RECOVERY PLAN FOR THE WHITE SHARK

Under the Australian National Recovery Plan for the White Shark (Plan), the use of lethal nets and drumlines is “to decline as alternatives are developed”.

There are numerous alternative non-lethal mitigation methods and technologies available today, many of which are already used by New South Wales. These include aerial surveillance, SMART drumlines, sensory deterrents, and improved community education. In particular, improved community education has displayed order-of-magnitude decreases in shark bite risk that culling has yet to demonstrate.

Given many of these are in fact being now widely used and adopted by NSW, in order to comply with the Plan, the use of shark nets must now cease.

We note that the Plan lists catch mortality in these programs as ‘accidental’. This is misleading and incorrect. Shark nets are designed to actively catch and kill white sharks along with other target (and non-target) species.

As shown on the Department of Primary Industry website, the Fisheries Scientific Committee determines that:<sup>1</sup>

*“The shark meshing program is a fishing activity involving the placement of nets off beaches and other waters to protect the public from sharks. Shark meshing on Sydney beaches began in 1937 to reduce the numbers of sharks and thereby reduce the risk of shark attacks.”*

Consequently, mortality from lethal shark mitigation processes such as nets, is listed as a principal threat to white shark recovery in Australia.

In addition, the Fisheries Scientific Committee has also found that species other than sharks are indiscriminately caught and often killed in the shark meshing program<sup>2</sup>; and that many of the bycatch species are listed as Vulnerable Species and Endangered Species under the EPBC Act. Meaning that the current shark meshing program in New South Wales waters adversely affects two or more threatened species, populations or, ecological communities and could cause species, populations, or ecological communities that are not threatened to become threatened.<sup>2</sup>

### **Recommendation 7:**

Given that the SMP is in conflict with the National Recovery Plan for the White Shark, as indicated in the Plan, shark nets shall be immediately replaced with non-lethal alternatives in meshing regions where white sharks are under significant threat from the SMP until such time the SMP is entirely phased-out. This information should be made publicly accessible.

<sup>1</sup> <https://www.dpi.nsw.gov.au/fishing/threatened-species/what-current/key-threatening-processes1/shark-meshing>, Ref. No. FR24 File No. FSC 02/05, FINAL RECOMMENDATION CURRENT SHARK MESHING PROGRAM IN NEW SOUTH WALES WATER, [https://www.dpi.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0003/636537/FR24-shark-meshing.pdf](https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0003/636537/FR24-shark-meshing.pdf)

<sup>2</sup> *ibid*

## 8. POST RELEASE (MORTALITY) DATA UNAVAILABLE

There is no known evidence or study that examines or tracks the mortality and survival rate of target shark catch, and bycatch, released alive from the SMP. Rather it seems to be assumed by DPI that animals released 'alive' will survive.

We strongly challenge this position. Videos obtained through GIPA applications clearly show some of these animals are released 'alive' but sink to the ocean bottom or are released in very poor condition.

### Videos:

1. [Australia's Shark Cull Exposed - Grey Nurse "released" and sinks to the bottom belly up!](#)
2. [Australia's Shark Cull Exposed - Great White Shark with horrific skin lacerations from shark net!](#)
3. [Australia's Shark Cull Exposed - White Shark with horrific shark net injuries fumbled back to sea!](#)

The [NSW Shark Meshing \(Bather Protection\) Program - 2016/17 Trigger Point Review Report<sup>1</sup>](#), acknowledges lack of data concerning the survivorship of animals released alive is an issue.

Even megafauna such as Humpback Whales, where it would be relatively simple to attach a GPS tracker during a release from a shark net, are not tracked after release. This lack of data adds a large degree of scientific uncertainty to the animals that are stated as released alive. The expert advice we have received indicates that many animals released 'alive' may soon die, increasing the negative environmental impact over and above what is currently stated.

This leads to an underrepresentation of mortality rates in NSW reporting, misrepresenting the true effect on the destabilisation of ecosystems and impact on protected, vulnerable, endangered, and other species (whether or not the species is targeted under the SMP).

Recently in Queensland, in response to a Humpback entanglement off Coolangatta beach (Aug 11th, 2021), rescuers failed to successfully release the whale during daylight hours on the first day of rescue and attached a GPS tracker to be able to recommence the rescue the following day.

After a second day of failed rescues (Aug 12th, 2021), rescue efforts were abandoned despite significant net, chain, and (deflated) buoys still being attached to the whale. This was verified by phone footage of the whale being spotted a few days later (Aug 15th, 2021).

Wayne Phillips (head of Sea World Rescue) was later quoted in the Guardian, stating:

*“When they cut off some of the net, the whale will swim off quite nicely but unfortunately it's still a death sentence. Any material around that fluke means the whale will end up succumbing.”<sup>2</sup>*

This whale is shown as 'alive' in Queensland Shark Control Program catch data when scientists and Wayne Phillips all agree it is now likely dead. NSW uses the same methodology for documenting animals released 'alive' relating to the SMP.

Images and videos obtained from DPI via GIPA requests also show sharks, including protected species such as White Sharks, being released in what can only be described as extremely unhealthy conditions.

Some are barely able to swim away from the boat and sink toward the sea floor. This once again brings into question the accuracy of the data published by DPI, and whether being reported as 'released' or 'alive' has any correlation at all to survival.

Applying the precautionary principle, the program should cease indefinitely, or until such time as this can be addressed.

### **Recommendation 8:**

Due to the likelihood that the impact of the SMP is much higher than currently reported, the 'Precautionary Principle' shall be applied and the shark meshing program be phased-out as per recommendation 5.

<sup>1</sup> NSW Shark Meshing (Bather Protection) Program - 2016/17 Trigger Point Review Report, [https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0006/856176/2016-17-trigger-point-review-report.pdf](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0006/856176/2016-17-trigger-point-review-report.pdf)

<sup>2</sup> The Kindest Cut: the Australians fighting to save humpback whales tangled in nets, <https://www.theguardian.com/environment/2022/jan/30/the-kindest-cut-the-australians-fighting-to-save-humpback-whales-tangled-in-fishing-nets>, 30 January 2022.

## 9. EFFICACY

It is clear from assessing data on shark incidents in regions that currently, or historically, operate some form of shark meshing/netting program, that there is simply no evidence of efficacy of these programs in their stated purpose.

### New South Wales

In New South Wales, 34 shark encounters have occurred at meshed beaches<sup>1</sup> since the program started. Since this statistic was published, there have been two further non-fatal incidents at Cronulla and Maroubra, both meshed beaches.

Since 2000, nine interactions in the Metro region have involved swimmers, and 25 involved surfers. Twenty-nine (85%) of these occurred at netted beaches while five occurred at non-netted beaches.<sup>2</sup>

The likelihood of surviving a shark bite has improved since 1937, largely attributed to quicker emergency response times, advancements in medical care and first aid techniques, a greater presence of water users in the vicinity to provide immediate assistance, and shifts in the behaviour of water users. Without the above events occurring in areas with prompt first aid and close proximity to world-class hospitals, the consequences of shark bites could have been fatal.<sup>3</sup> Let's not unfairly attribute these survivals to the fact that shark nets were in place.

Furthermore, the proximity of Little Bay to Maroubra (which is a netted beach), where Simon Nellist was killed by a shark in February 2022, means that some may consider this tragedy to have occurred in an area considered 'protected' by the SMP, given the program aims to remove sharks from the area, not just individual beaches.

A recently released review<sup>4</sup> by the TSSC on the SMP's 2021/22 Annual Performance Report comprehensively exposes the NSW meshing program for its lack of efficacy.

TSSC found 82% of the shark incidents since 2000 on the NSW coast had occurred at netted beaches indicating shark nets don't stop shark interactions.

*“Overall, we are extremely concerned that the current management actions are not meeting either of the [JMA] objectives.”*

Sharks have been systematically removed from the Sydney coastline via the use of lethal shark nets since 1937, so there is an argument that the entire Sydney coastline is 'protected' by lethal shark mitigation, rather than simply the 51 beaches directly adjacent to these nets, given they are not a barrier for any individual beach, but a fishing device removing sharks from the greater area.

These shark incident numbers are not statistically different from those seen prior to the program's inception, or those seen at 'non-protected' beaches, proving this program is ineffective. This is supported by the scientific community:

*“The SMP is frequently described as the key factor responsible for reducing the risk of shark bite in NSW. The 2009 review explicitly states ‘the SMP has been effective in reducing incidences of fatal shark attack’ (Green et al., 2009, p. v). There are two major arguments for the SMP, namely few fatalities at meshed beaches and a reduction in the incidence of shark bite since the Program's introduction (Department of Primary Industries, 2012b; Green et al., 2009). Here, we present analysis of ASAF data for NSW, focusing on fatalities and non-fatal injuries. We then discuss four broader social-cultural factors that contribute to the incidence and outcomes of human-shark encounter: increase in population and beach use; changes in cultures of beach- and ocean-use; developments in beach patrol and surveillance; and improvements in emergency and medical response (see Figure 2).”*

*Source: Effects and effectiveness of lethal shark hazard management: The Shark Meshing (Bather Protection) Program, NSW, Australia (Gibbs)*

White Sharks and Tiger Sharks are both targeted by the SMP and are within the top four biggest shark species. Bull sharks are the third species targeted by the SMP but are smaller than tiger sharks and white sharks. Further, larger sharks are able to break free from nets as can be seen from these comments:

1 19/20 NSW Performance Report  
2 [https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0009/1398267/Cardno-Report.PDF](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0009/1398267/Cardno-Report.PDF)  
3 <https://www.nature.com/articles/s41598-022-16950-5>  
4 [https://www.sharksmart.nsw.gov.au/\\_\\_data/assets/pdf\\_file/0003/1433469/9caae8f8c5bb0187413ec01b54fc9c09c8822ddb.pdf](https://www.sharksmart.nsw.gov.au/__data/assets/pdf_file/0003/1433469/9caae8f8c5bb0187413ec01b54fc9c09c8822ddb.pdf)

“Central Coast contractor reported a significant hole found in the Avoca Beach net possibly caused by a large shark” and “Central Coast South contractor reported Avoca Beach net damage. Large animal (shark) appears to have bitten through the top line” and even “Avoca beach net had sustained damage. A section of net approx. 2.4m x 2.4m had been torn and it is believed to have been caused by a large animal (shark).”

### Queensland

In Queensland, “there has been only one fatality and 27 unprovoked bites on a Shark Control Program (SCP) protected beach since 1962.”<sup>5</sup> Since this statistic was published, there have been two further incidents, one non-fatal bite at Bribie Island and one fatal incident at Greenmount Beach.

In a 2019 legal case against the Department of Agriculture & Fisheries (QLD), the Judge found

*“The lethal component of the SCP does not reduce the risk of unprovoked shark interactions. The scientific evidence before us is overwhelming in this regard.”*<sup>6</sup>

This again supports the evidence that these programs are ineffective at reducing shark interactions.

### South Africa

Since 1952, South Africa also used similar nets, aiming to reduce shark populations and therefore interactions. Since this time, 46 people have been bitten by sharks at ‘protected’ beaches, with 10 of these being fatal.

### New Zealand

Dunedin, New Zealand had also employed the use of nets as a way to reduce shark interactions with humans for 40 years; however, in 2011, the nets were removed. This was a result of an investigation, and subsequent vote, carried out by the Dunedin City Council following an Otago Daily Times feature condemning the practice. The shark nets were removed in 2011, despite loud concern from minority sections of the community that there would be fatalities if this were to occur. Since the removal of the nets, no bites or fatalities have occurred.<sup>7</sup>

The above examples clearly show that nets are not an effective strategy to reduce shark-human interactions anywhere, including in New South Wales, interstate, or even internationally.<sup>8</sup>

### Recommendation 9:

The NSW government shall acknowledge publicly that based on available data from regions where shark nets/meshing is or has been used, the data fails to show evidence of the efficacy of these programs, to their stated purpose, and also acknowledge that the program’s impact on the environment more broadly is unknown.

This is key to gaining broader acceptance for the non-lethal measures currently in use, discussed further in Recommendation 10.

<sup>5</sup> Queensland Shark Control Program: Review of alternative Approaches, 20 September 2019, (The Cardno Report), <https://www.publications.qld.gov.au/dataset/e20e-6bccd-c076-42a2-9e17-7d549b02254e/resource/76358bc5-a2fa-46ce-a8cb-0891c75e971a/download/qld-shark-control-program-review-alternative-approaches.pdf>

<sup>6</sup> Humane Society International (Australia) Inc v Department of Agriculture & Fisheries (Qld).

<sup>7</sup> <https://www.nzherald.co.nz/nz/shark-attacks-warning-if-beach-nets-removed/XNF5YJD2PFLO2ZFDNUHCS6ERG4/>, <https://www.odt.co.nz/lifestyle/magazine/shark-nets-are-they-worth-it>; <https://teara.govt.nz/en/interactive/5334/recorded-shark-attacks-in-new-zealand-to-2014>

<sup>8</sup> SUCCESS OF THE KWAZULU-NATAL SHARKS BOARD IN PREVENTING SHARK ATTACKS

<http://shark.co.za/Pages/ProtectionSharks-SASharkattack>; and Shark attack data for KwaZulu-Natal, South Africa, [http://www.sharkattackdata.com/place/south\\_africa/kwazulu\\_natal](http://www.sharkattackdata.com/place/south_africa/kwazulu_natal)

## 10. COMMUNITY SENTIMENTS

On March 3, 2022, a unanimous resolution passed and Local Government NSW requested that the NSW Government phases out the use of shark nets. The historic motion also asks that the shark nets be replaced with a combination of alternatives that protect swimmers more effectively and do not harm marine wildlife.

The precursor to the unanimous resolution was that 7 of the 8 local councils at which the Meshing Program operates, passed motions and provided feedback to DPI in 2021 requesting that nets be removed from their local beaches in favour of modern non-lethal alternatives.

Currently, the NSW government has refused to act.

Numerous polls show the public strongly opposes shark meshing at beaches for various reasons, including due to the killing of marine animals, impact on the marine environment, and disturbance to marine ecosystems:

- The Morning Show asked: Four sharks have been killed following two attacks that left victims in hospital—do you think sharks should be culled? 90% No, 10% Yes (13.1K votes)
- ABC Brisbane asked: Should sharks be culled in response to attacks on humans? 84% No, 16% Yes (9.1K votes)
- Channel 7 Brisbane asked: Do you agree with catching and killing sharks? 23% Yes, 77% No (12.7K votes)
- Courier Mail asked: Should sharks be culled in Queensland? 31% Yes, 69% No (552 votes)
- Fairfax Media asked: Do you support the culling of sharks after an attack? 10% Yes, 90% No (voter number unknown)

This is further supported by the wider community calling for the replacement of shark meshing with non-lethal alternatives such as those adopted by other Countries and other Australian jurisdictions, such as recently in Western Australia.

On March 29, 2023, a survey<sup>1</sup> of 500 residents from Waverley Council in Sydney was released by the University of Sydney. The survey looked at public attitudes towards sharks, shark nets, and shark bite mitigation.

The results of the survey are as follows:

- 70% would not blame the state Government if shark nets were taken out and there was a fatal shark attack at that beach;
- 75% would return to the beach if shark nets were taken out;
- 71% believe shark attacks are accidental;
- 71% believe “no one” is to blame for shark attacks; and
- 7% support putting in shark nets following a shark attack.

In our experience, there are key organisations and individuals in NSW (and QLD) that are afraid to speak out against the use of lethal measures, for fear of government reprisals or pressure. Regardless of whether these fears are real or perceived, it inhibits positive and informed debate on the SMP and related issues.

As a result, we believe governments are underestimating the community’s widespread sentiment and support for the removal of lethal mitigation devices.

### **Recommendation 10:**

The NSW government shall immediately put in place a communications process to facilitate open and transparent feedback and dialogue between government departments, non-government organisations, and communities about the SMP, its lack of proven efficacy, its impacts on the environment, and the strategy and timeline to phase out the program.

This includes making the results of all government shark sentiment surveys that have been previously withheld public.

The purpose of this communication is to encourage a deeper community understanding of the effectiveness of the non-lethal measures currently in use, the lack of effectiveness of shark nets, and immediate steps being taken to move to more effective non-lethal shark bite mitigation measures.

<sup>1</sup> <https://www.sydney.edu.au/sydney-environment-institute/our-research/biocultural-diversities/human-shark-relations.html>

## 11. EQUIPMENT LOSSES

When shark meshing program equipment becomes dislodged or damaged, it becomes an extreme safety risk to the marine environment and to ocean users, as well as adding to plastic pollution.

For example, a [drumline washed up](https://youtu.be/Z1nINgCmqck)<sup>1</sup> on Woorim Beach in April 2022. <https://youtu.be/Z1nINgCmqck>

A few weeks later also in April 2022, a [drumline became loose at Sunrise Beach](#)<sup>2</sup> with a shark hooked and swimming in the surf break.

This is also happening in New South Wales, as reported in the 21/22 Performance Report.

- *6 March 2022, Illawarra contractor reported that the Coledale net was missing. A search of the area over the following weeks failed to find the net, and it is still missing.*
- *7 March 2022, Sydney Central contractor reported that the Manly net was missing, and subsequent searches of the area have failed to find the net.*
- *13 March 2022, Hunter contractor reported that Dixon Park net was missing. A search of the area over the next few days failed to find the net. The contractor reported on 18 March that the net had been reportedly found on Dixon Park beach by NSW surf lifesavers and was dragged up next to the surf club. The contractor attended the surf club to collect the net, but the net was not found. The net is suspected to have been put into an industrial waste bin, but this is unconfirmed.*

Shark net equipment losses happen regularly, as evidenced by another example from the 2021/22 performance report:

*“Sydney North contractor reported that the Palm Beach net had a large section (approx. 4 - 5m) missing and the mesh was snapped, suspected caused by a large animal. The missing mesh was not recovered.”*

And large sharks are able to break free from nets as can be seen from these comments:

“Central Coast contractor reported a significant hole found in the Avoca Beach net possibly caused by a large shark” and “Central Coast South contractor reported Avoca Beach net damage. Large animal (shark) appears to have bitten through the top line” and even “Avoca beach net had sustained damage. A section of net approx. 2.4m x 2.4m had been torn and it is believed to have been caused by a large animal (shark).”

### **Recommendation 11:**

Weekly social media updates about the catch of the SMP and SMART drumlines should be made publicly available, including reporting on damaged, dislodged, and lost equipment.

As part of this regular reporting, the public should be informed when equipment becomes dislodged and not recovered immediately, as these pose a potential danger to ocean users including swimmers, surfers, fishers, and craft operators. It may also facilitate locating lost equipment more quickly.

This level of instant communication is already in place for communicating water temperature as measured by VR4G stations, and when pop-up shark tags have landed on a beach and community assistance is required to locate them.

These resources should also be applied to communicating a weekly summary of catch-and-kill statistics of shark nets, drumlines, as well as lost gear.

<sup>1</sup> Shark drumline washed up on Woorim beach April 2022, Video, ABC News, <https://www.abc.net.au/news/2022-04-22/shark-drum-line-washed-up-on-woorim-beach-bribie/13851104>, <https://youtu.be/Z1nINgCmqck>  
<sup>2</sup> <https://youtube.com/shorts/N7PKSQ8DDJA?feature=share>

## 12. SHARK MESHING PROGRAM PHASE-OUT

While the immediate withdrawal of the program should be the primary goal of the NSW government, it is crucial to develop a comprehensive **phase-out plan with a timeframe of no more than 12 months**.

The plan should focus on minimising the imminent risk to protected and non-target species while ensuring the permanent removal of shark nets from all beaches.

As public awareness and scientific understanding have evolved, it is evident that the current approach is neither effective nor sustainable. Therefore, it is imperative that the NSW government takes proactive steps to phase out this program and implement alternative, non-lethal strategies for shark mitigation.

The first stage of the phase-out plan should prioritise the permanent and immediate removal of nets from beaches with special circumstances, considering their ecological, historical, or other significant or unusual circumstances.

For example, two beaches that warrant immediate attention in this regard are Garie Beach and Bondi Beach. Garie Beach, situated within the Royal National Park, has been closed to the public since early 2022 and therefore does not warrant the use of any lethal devices.

The Heritage listed Bondi Beach, including protection for the ocean waters out to the headland, is in direct conflict with the use of shark nets. The area also includes an aggregation site for the Grey Nurse shark, a protected species under the EPBC Act. These situations and others similar to these require decisive and urgent attention to minimise the imminent ecological risk.

It is important to stress that the phased approach should serve as a transitional measure rather than a long-term solution. The focus should be on implementing non-lethal shark mitigation methods that are scientifically proven to be effective, such as increased surveillance, shark spotters, drone technology, acoustic deterrent devices, and public education programs.

The plan should also include the use of shark nets only during daylight hours, in line with SMART drumline use. Furthermore, during a phase-out period, it is crucial to establish a comprehensive contingency plan to address any unforeseen circumstances that might tempt the deployment of nets for temporary periods.

This phased approach should serve as a stepping stone toward a near future where all beaches are free from shark meshing or other lethal devices and are safeguarded by sustainable, non-lethal, proactive measures for the protection of people, wildlife, and the environment.

### **Recommendation 12:**

The NSW government shall immediately end the SMP.

However, it is crucial that if the NSW government does not plan to follow this recommendation prior to the next meshing season, a comprehensive **phase-out plan, with a timeframe of no more than 12 months** is developed.

The plan should focus on minimising the imminent risk to protected and non-target species while ensuring the permanent removal of shark nets from all beaches.

The phased approach should serve as a transitional measure rather than a long-term solution.

- The first stage of the phase-out plan should prioritise the removal of nets from beaches with special circumstances, considering their ecological, historical, other, or unusual circumstances.
- During a phase-out period, it is crucial to establish a comprehensive contingency plan to address any unforeseen circumstances that might tempt the deployment of nets for temporary periods.
- This plan should be based on a thorough risk assessment and prioritise the protection of both beachgoers and marine biodiversity, including the use of nets only during daylight hours, in line with SMART drumline use.

## 13. CONCLUSION

In conclusion, it is clear that the SMP does not achieve its goal to keep ocean goers safe. It is also clear that it has a disastrous and potentially long-lasting effect on the marine ecosystem.

The overarching recommendation of this investigation is that the NSW government immediately prioritise the withdrawal of the SMP and develop a well-structured short-term (12 months or less) phase-out strategy should shark nets return to the waters for any further meshing seasons.

Simultaneously, efforts must be directed towards further implementing alternative, non-lethal shark mitigation methods that protect both humans and marine ecosystems. This phased approach should serve as a stepping stone toward a near future where all beaches are free from shark meshing and are safeguarded by sustainable, non-lethal solutions.

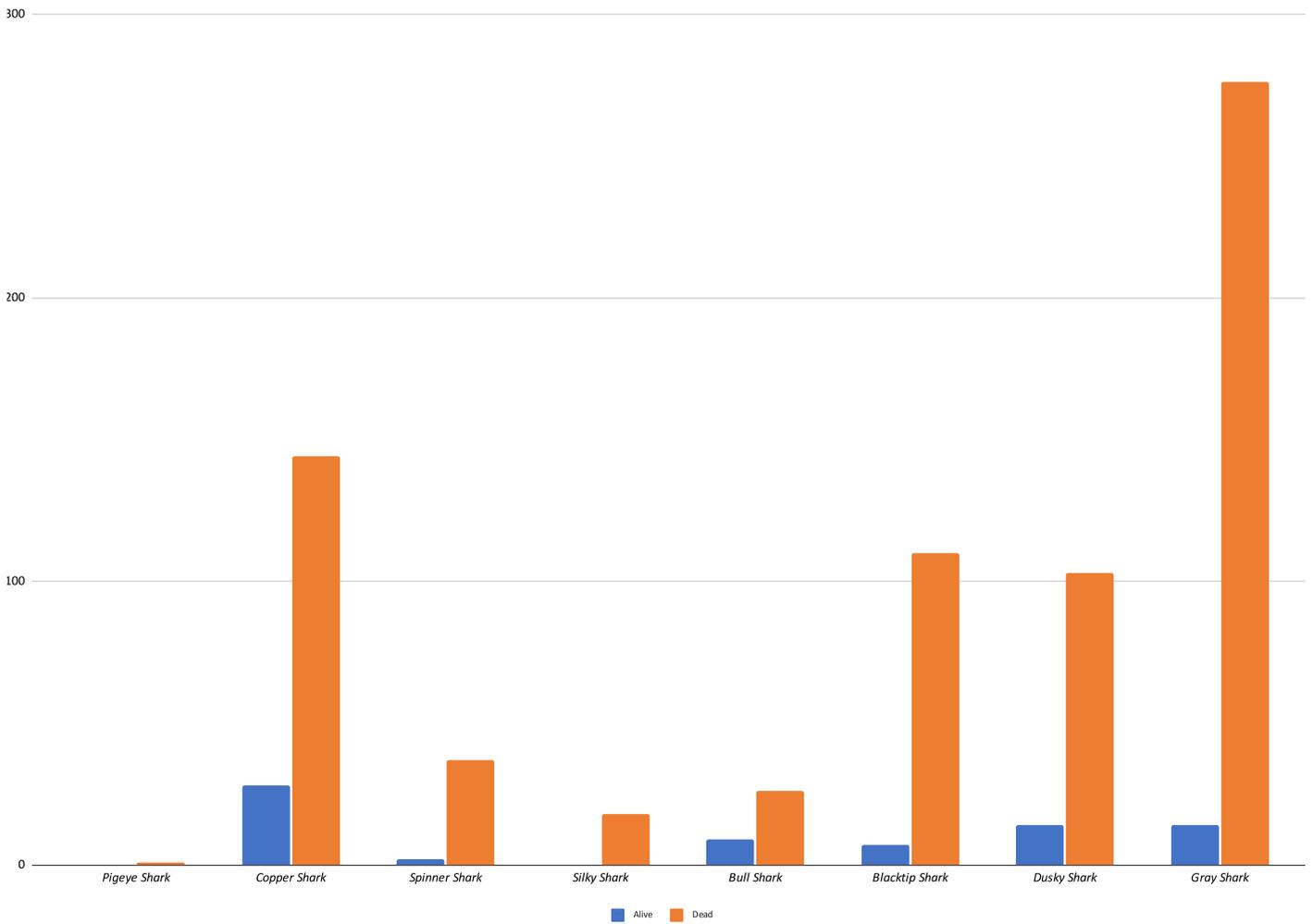
## APPENDIX 1 – RECOMMENDATIONS

<b>Section</b>	<b>#</b>	<b>Recommendation</b>
<b>Data Integrity</b>	1	<p>The NSW government shall take the below immediate steps, prior to further meshing seasons (if any):</p> <ul style="list-style-type: none"> <li>• Improve reporting accuracy of catch data via independent monitoring for 100% of net checks</li> <li>• Track post-release mortality via tagging and detailed reporting on post-release deaths/suspected deaths</li> <li>• Conduct a thorough audit of existing datasets to, where possible, rectify all historical data accuracy errors</li> <li>• Make raw data relating to the SMP’s catch and kill rates since 1950 publicly accessible and downloadable to enable further independent assessment of data</li> <li>• Provide transparent reporting on in-utero shark pups and other in-utero species killed</li> <li>• Provide timely and transparent reporting of equipment that is dislodged, retrieved, or lost, including the circumstances and any consequences</li> </ul> <p>Access to all of the above data should be publicly available and not require a GIPA application.</p> <p>The current reporting accuracy issues create significant scientific uncertainty, and by applying the precautionary principle, this program is recommended to cease on this basis until this can be rectified.</p>
<b>Breaches of the EPBC Act</b>	2	<p>The Federal Minister for the Environment call in a review of the SMP for suspected breaches of the <i>Environment Protection and Biodiversity Act 1999</i> and to investigate the impact of the SMP on threatened and protected species, particularly migratory species.</p>
<b>Trigger Point Inadequacies</b>	3	<p>DPI and DEH should urgently revise the trigger points to be proactive measures with pre-defined, decisive, and timely responses when triggers trip, in line with NSW Government guidelines of 2022. These should be retrospectively applied to the past five years of the SMP, to fairly assess the damage the program is causing.</p> <p>Trigger points should proactively minimise harm and should also include these basic tenets:</p> <ul style="list-style-type: none"> <li>• Any shark incident in any meshing region must be considered a failure of the meshing program and trigger a review</li> <li>• Any threatened or protected species caught in any shark meshing equipment must be considered a failure of the meshing program and trigger a review</li> <li>• Any non-target species caught in any shark meshing equipment must be considered a failure of the meshing program and trigger a review</li> <li>• Any lost and unrecovered shark meshing equipment must be presumed to be ghost equipment which will be left to kill wildlife for decades and must be considered a failure of the meshing program</li> <li>• Any animal released alive, that perishes within 183 days (will require tracking of all released animals) must be considered a failure of the meshing program</li> <li>• Timely and pre-defined actions to respond to tripped trigger points</li> <li>• Regular reporting available publicly on trigger point incidents</li> </ul>
<b>NSW Senate Inquiry Findings</b>	4	<p>The NSW government shall utilise data gained from testing alternative methods, such as the superior target shark catch rates of SMART drumlines, and the proven ability of drones to spot target sharks, and use these methods to finally and fully comply with Recommendation 7 of the committee, ending the SMP.</p>

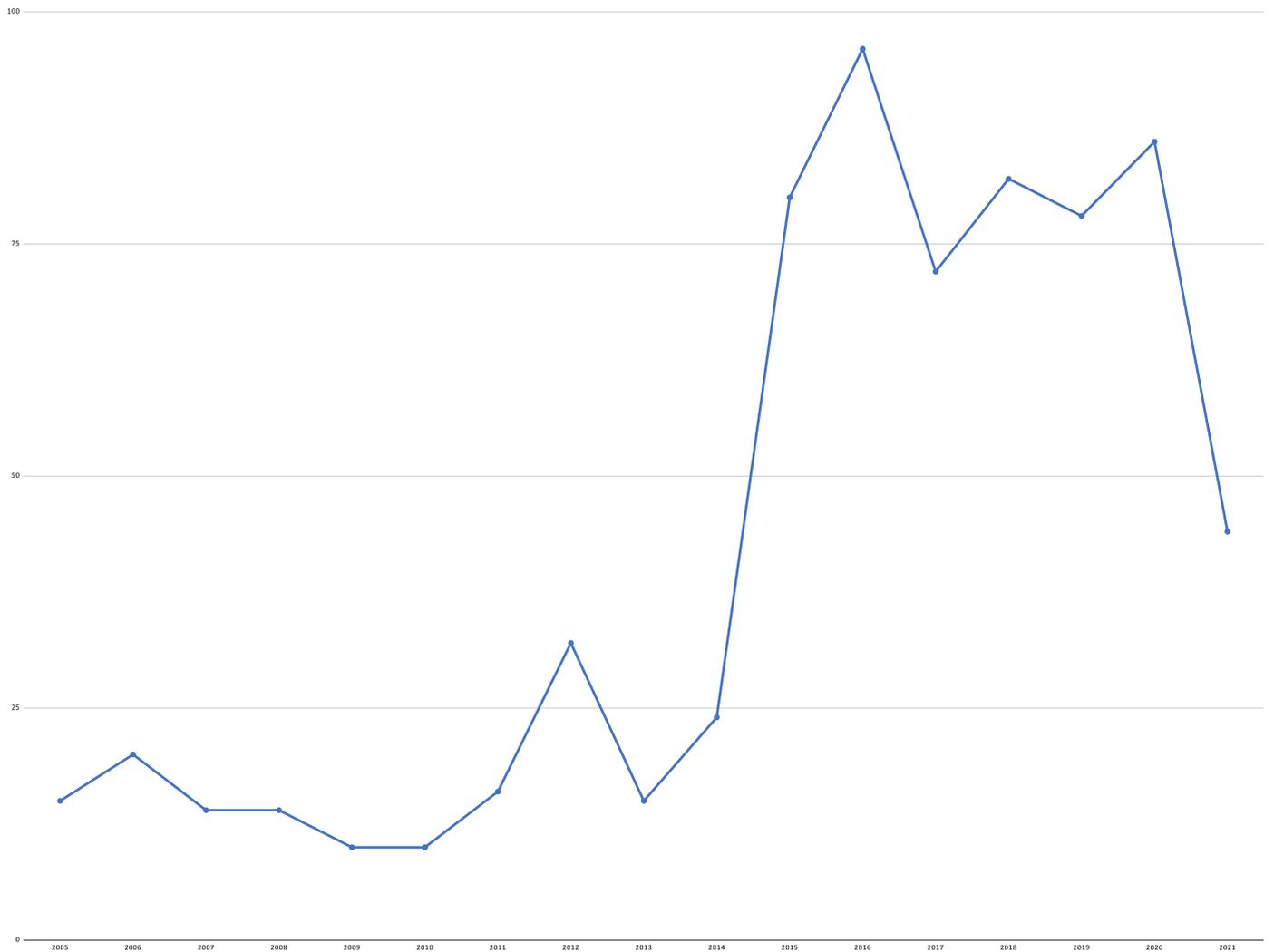
<b>Section</b>	<b>#</b>	<b>Recommendation</b>
<b>Federal Senate Inquiry Findings</b>	5	The NSW government shall make publicly available the timeline and plan for phasing out the SMP. A draft plan shall be available for public consultation before 1 September 2023.
	6	If there are delays to the implementation of Recommendation 5, the NSW government shall immediately change the standard operating practices of the SMP so that it only operates during the summer months and only during daylight hours (as per SMART drumlines), until such time as nets are phased out fully.
<b>White Shark Recovery Plan</b>	7	Given that the SMP is in conflict with the National Recovery Plan for the White Shark, as indicated in the Plan, shark nets shall be immediately replaced with non-lethal alternatives in meshing regions where white sharks are under significant threat from the SMP until such time the SMP is entirely phased-out. This information should be made publicly accessible.
<b>Post Release Mortality Data</b>	8	Due to the likelihood that the impact of the SMP is much higher than currently reported, the 'Precautionary Principle' shall be applied and the shark meshing program be phased-out as per recommendation 5.
<b>Efficacy</b>	9	The NSW government shall acknowledge publicly that based on available data from regions where shark nets/meshing is or has been used, the data fails to show evidence of the efficacy of these programs, to their stated purpose, and also acknowledge that the program's impact on the environment more broadly is unknown. This is key to gaining broader acceptance for the non-lethal measures currently in use, discussed further in Recommendation 10.
<b>Community Sentiment</b>	10	The NSW government shall immediately put in place a communications process to facilitate open and transparent feedback and dialogue between government departments, non-government organisations, and communities about the SMP, its lack of proven efficacy, its impacts on the environment, and the strategy and timeline to phase out the program. This includes making the results of all government shark sentiment surveys that have been previously withheld public.
		The purpose of this communication is to encourage a deeper community understanding of the effectiveness of the non-lethal measures currently in use, the lack of effectiveness of shark nets, and immediate steps being taken to move to more effective non-lethal shark bite mitigation measures.
<b>Equipment Losses</b>	11	Weekly social media updates about the catch of the SMP and SMART drumlines should be made publicly available, including reporting on damaged, dislodged, and lost equipment.
		As part of this regular reporting, the public should be informed when equipment becomes dislodged and not recovered immediately, as these pose a potential danger to ocean users including swimmers, surfers, fishers, and craft operators. It may also facilitate locating lost equipment more quickly. This level of instant communication is already in place for communicating water temperature as measured by VR4G stations, and when pop-up shark tags have landed on a beach and community assistance is required to locate them.
		These resources should also be applied to communicating a weekly summary of catch-and-kill statistics of shark nets, drumlines, as well as lost gear.
<b>SMP Phase-out Plan</b>	12	The NSW government shall immediately end the SMP.
		However, it is crucial that if the NSW government does not plan to follow this recommendation prior to the next meshing season, a comprehensive <b>phase-out plan, with a timeframe of no more than 12 months</b> is developed.
		The plan should focus on minimising the imminent risk to protected and non-target species while ensuring the permanent removal of shark nets from all beaches.
		The phased approach should serve as a transitional measure rather than a long-term solution. <ul style="list-style-type: none"> <li>The first stage of the phase-out plan should prioritise the removal of nets from beaches with special circumstances, considering their ecological, historical, other, or unusual circumstances.</li> <li>During a phase-out period, it is crucial to establish a comprehensive contingency plan to address any unforeseen circumstances that might tempt the deployment of nets for temporary periods.</li> <li>This plan should be based on a thorough risk assessment and prioritise the protection of both beachgoers and marine biodiversity, including the use of nets only during daylight hours, in line with SMART drumline use.</li> </ul>

## APPENDIX 2 – GRAPHS

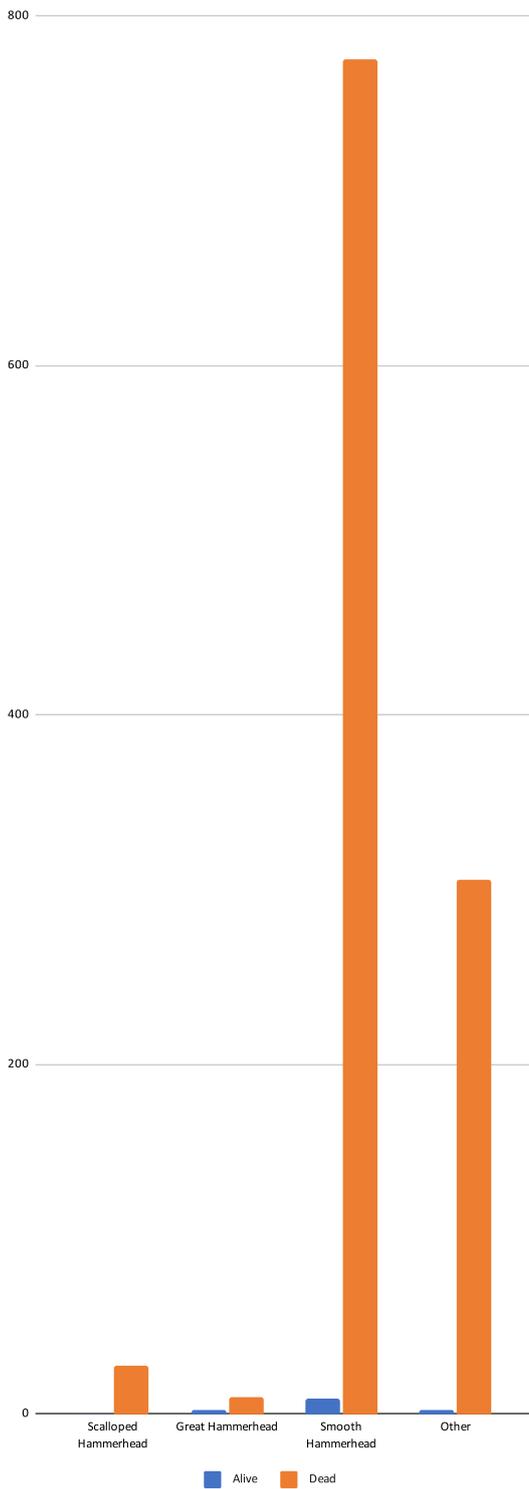
Graph 1: Requiem Shark (Carcharhinidae) numbers from 1999 - 2021



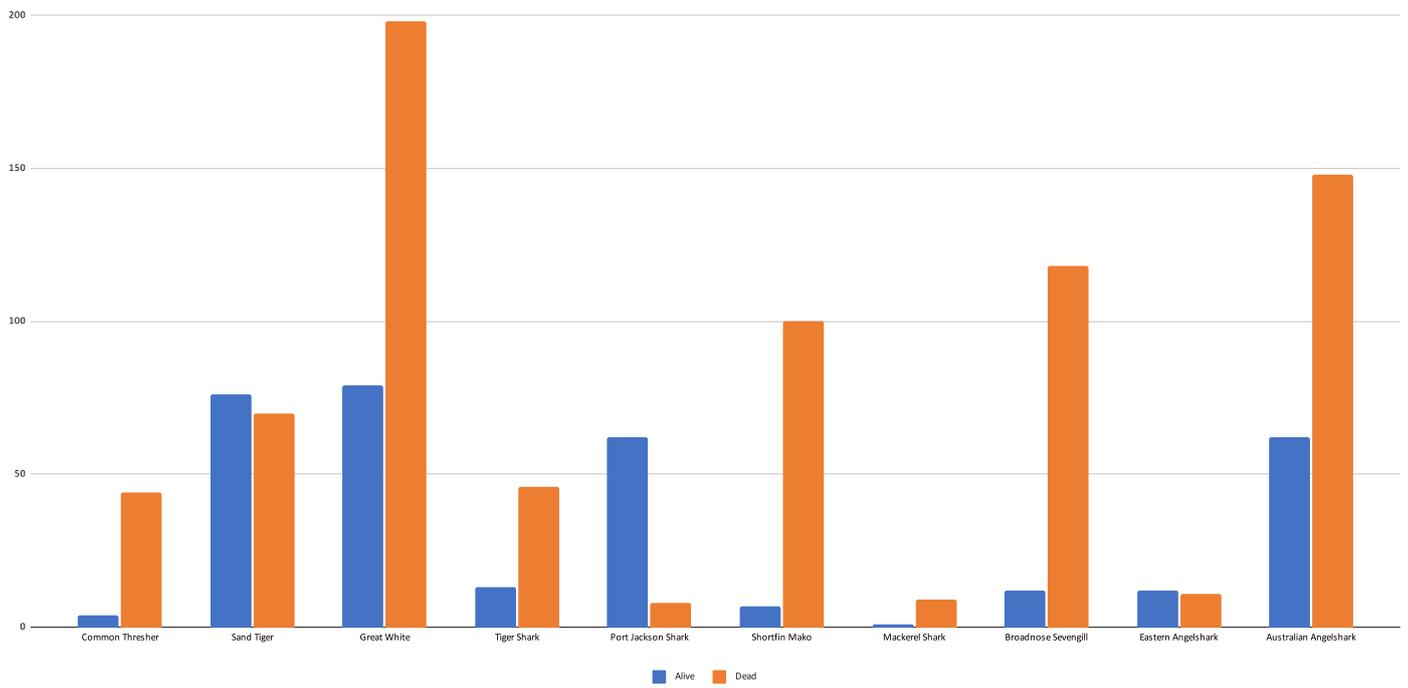
Graph 2: NSW Smooth Hammerhead (*Sphyrna Zygaena*) bycatch from 2005 - early 2021



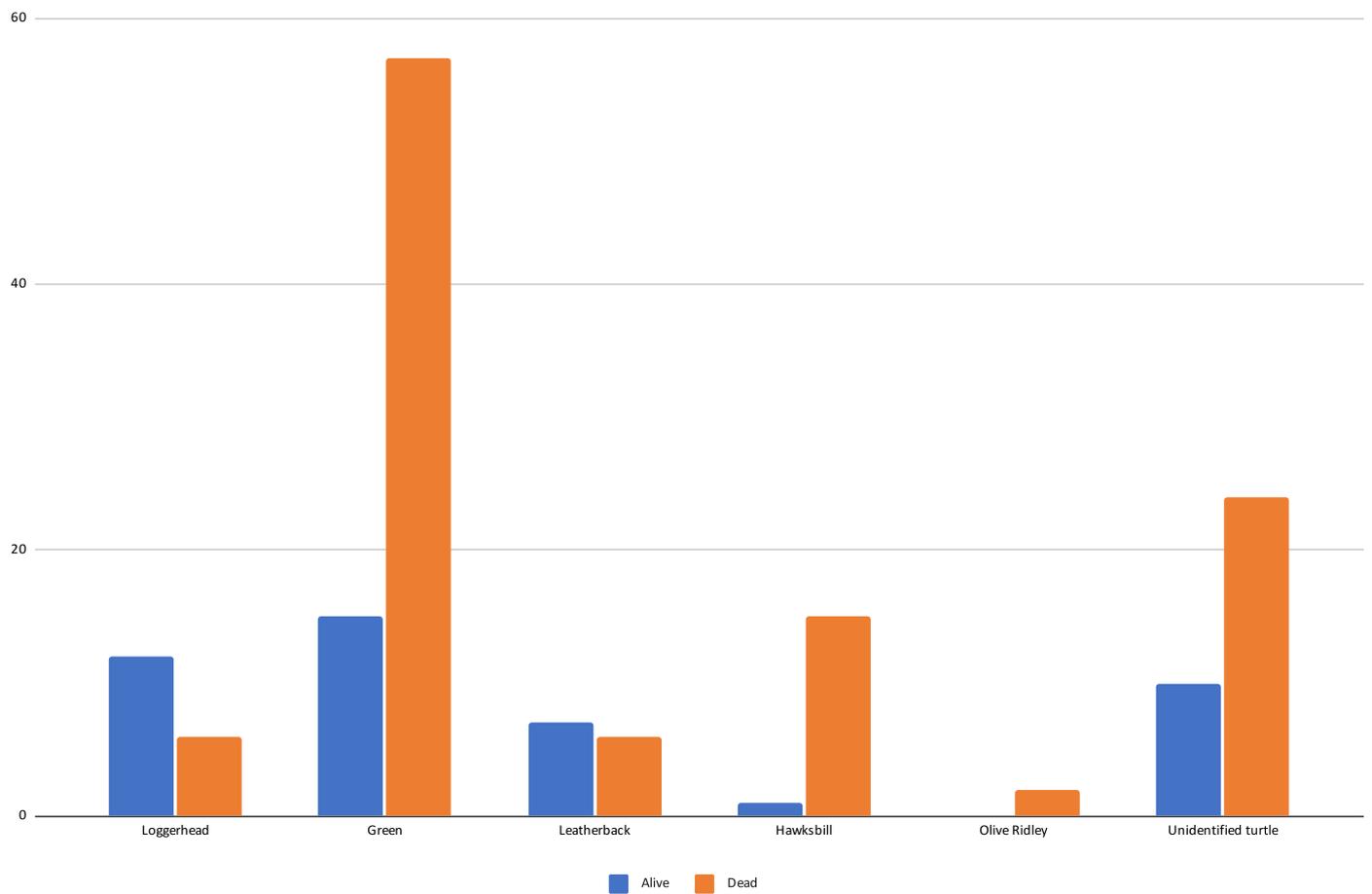
Graph 3: NSW Hammerhead Shark (Sphyrnadae) numbers from 1999 - 2021



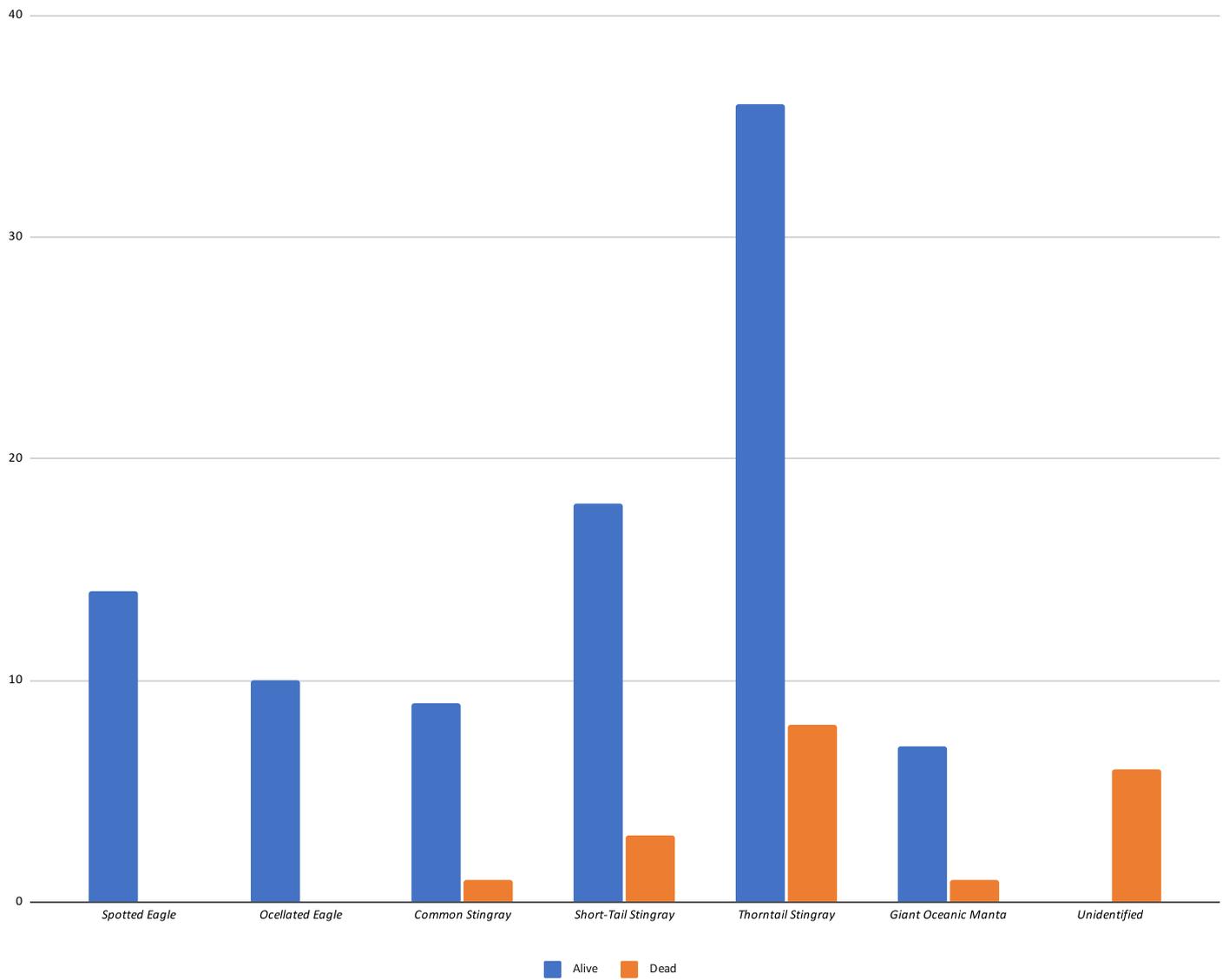
Graph 4: NSW Misc shark numbers from 1999 - 2021



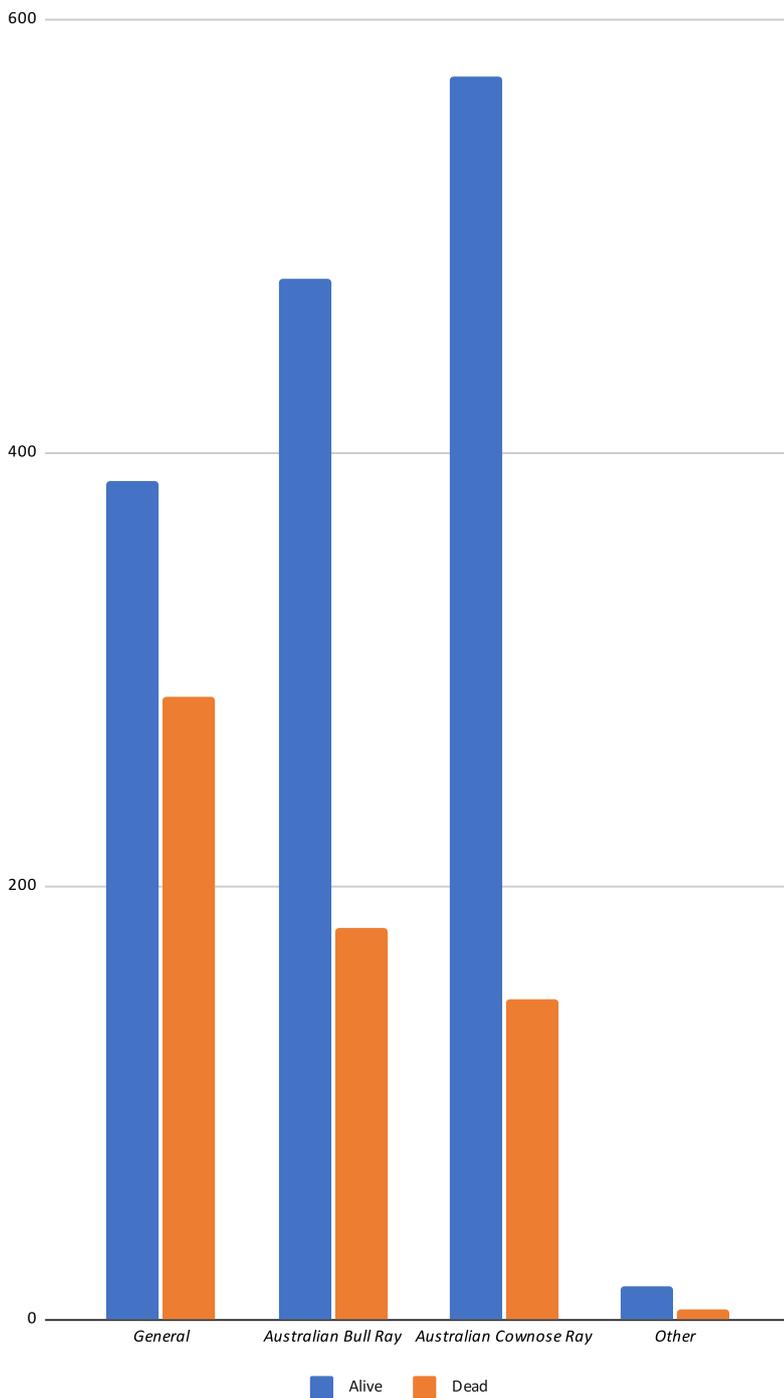
Graph 5: NSW Sea Turtle numbers from 1999 - 2021



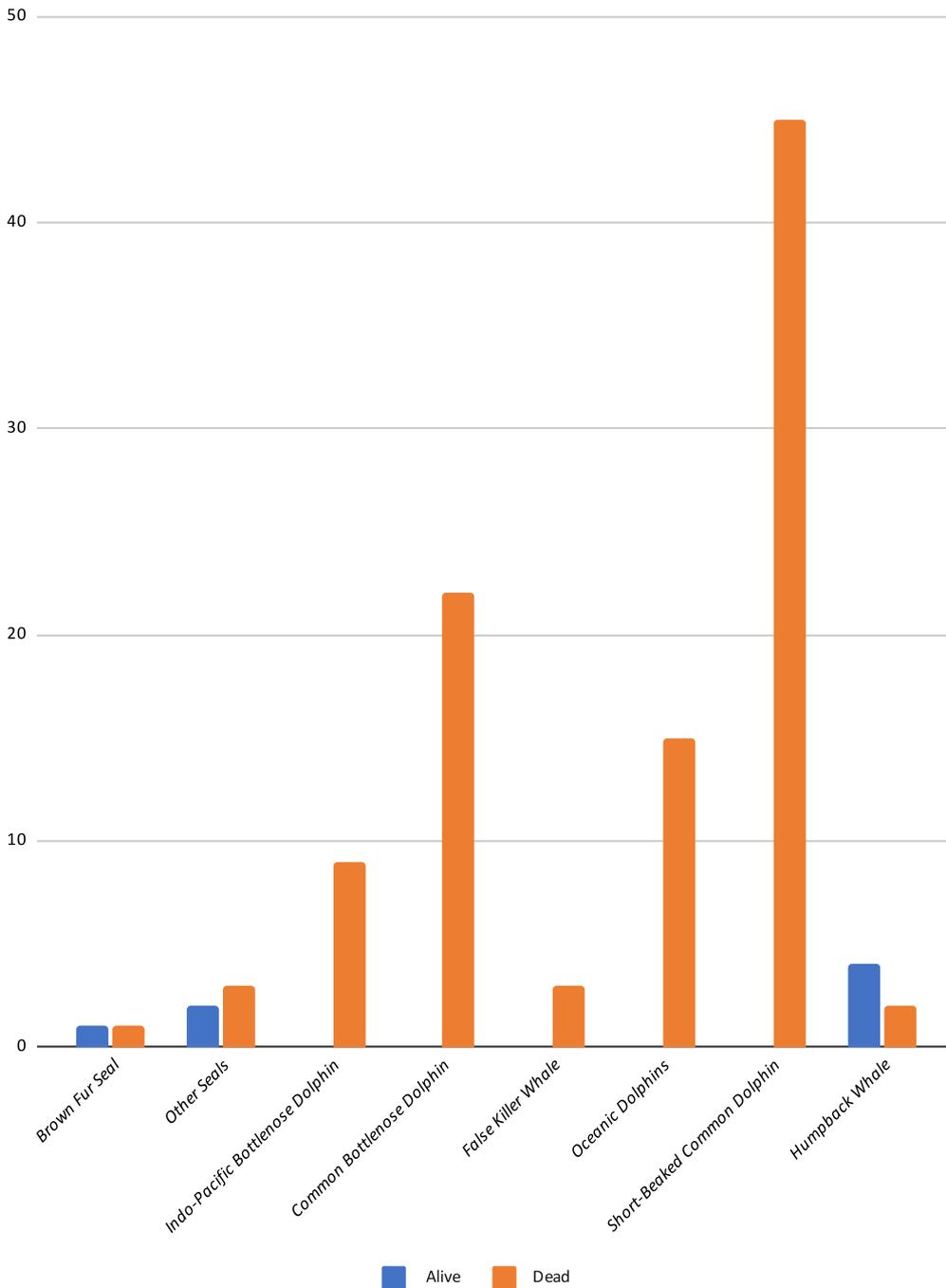
Graph 6: NSW Ray catch numbers from 2019 - 2021



Graph 7: NSW Stingray (Myliobatiformes) and Cownose Ray (Rhinoptera) catch numbers from 2019 - 2021



Graph 8: NSW Mammal numbers from 1999 - 2021





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