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## **The Great Barrier Reef Marine Parks Shark Control Program (DAF application G33288.1)**

This submission is made by North Queensland Conservation Council (NQCC) on behalf of its 3000+ members and supporters.

NQCC, the regional conservation council for the area from Bowen to Cardwell and from the Reef to the NT border, has been acting as the voice for the environment since 1974 and has been incorporated since 1984. It is recognised as an authority on environmental matters within its region and, in collaboration with environmental organisations throughout the state and country, on issues that extend beyond its boundaries.

In summary, NQCC contends that the risk (as opposed to the 'perceived' risk) to the community from sharks is negligible, especially in the light of the importance of sharks as apex predators in the environment, and that there is no justification for the expansion or the continuation of the Program.

It is recommended that, in refusing this application, the Queensland government be alerted to the need to identify alternative, non-lethal 'control' technology (possibly in collaboration with other states, such as NSW, SA and WA) and undertake a community education campaign based on peer-reviewed science.

### **Why control sharks?**

The Department of Agriculture and Fisheries' application for continuation (*in reality, expansion*) of the GBRMPs Shark Control Program (the Program) is (according to the information package made available) based on the argument that the aim is to '*reduce the possibility of shark attacks on humans in coastal waters of the State adjacent to coastal beaches used for bathing*'.

This purpose begs many questions. For example: Reduce by how much? Because risk cannot be removed altogether, reduce to what level? How is 'coastal waters' defined? What is meant by 'adjacent'?

Before making any decisions on the application it is essential that the purpose of the proposed action is accurately defined. Unless this occurs it is impossible to ascertain the net benefit of the Program or to assess its success or failure in achieving its purpose.

The argument for 'controlling' sharks in Australian waters is, it is contended, based largely on a political desire to assuage largely ill-founded, and possibly limited, fear in the community that they will be 'eaten by a wild animal' when they voluntarily enter that creature's natural domain for the purpose of non-essential recreation.

No such policy relates to, for example, snakes, despite the facts that (i) far more people die of snake bite than shark attack in Australia, and (ii) snakes share the 'natural' domain of humans, so are far more likely to be involuntarily encountered.

### **The size of the problem**

The likelihood of 'death by shark' is extremely low. In the 224 years between 2015 (to date) and 1791<sup>1</sup>, there have been just 234 fatal shark attacks – or 1.04 per year – in all Australian waters. Of these fatalities, only 183 (or 0.82 per year) have been 'unprovoked'.<sup>2</sup>

In Queensland, over the past 100 years, there have been 56 fatal unprovoked shark attacks (0.56 per year) and 87 cases of injury from an unprovoked shark attack (0.87 per year).

Comparison with other causes of premature death demonstrate the miniscule risk of death by shark attack. People are less likely to die as a result of unprovoked shark attack (0.82 deaths per year Australia-wide) than they are to die from: drowning (292/yr); skin cancer (2209 in the year 2013); allergic reaction (10); horse riding accidents (20); accidental falls (1920 in 2013).

Furthermore, the rate of attack does not appear to be changing. NQCC notes, and has no reason to dispute, the following expert comment:

*The increase in shark attacks over the past two decades is consistent with international statistics of shark attacks increasing annually because of the greater numbers of people in the water.*<sup>3</sup>

In other words, the risk of unprovoked shark attack for each person has not increased. On this basis there is no argument for expanding the Program.

### **The costs and benefits of shark control**

In order to make an informed decision on whether or not to permit the continuation of the Program, it is useful to undertake a comparison of its costs and benefits. These are discussed below. Overall, it is hard to avoid the conclusion that the costs of the Program are disproportionate to the benefits. This disproportionality is highly relevant in managing the risk of shark attack (discussed later).

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<sup>1</sup> <https://taronga.org.au/animals-conservation/conservation-science/australian-shark-attack-file/latest-figures>

<sup>2</sup> A 'provoked' incident relates to circumstances where the person attracts or initiates physical contact with a shark (accidentally or on purpose) or was fishing for, spearing, stabbing, feeding, netting or handling a shark or where the shark was attracted to the victim by activities such as fishing, spear-fishing, commercial diving activities (actively collecting abalone, pearl shells, or other marine animals) and cleaning of captured fish.

<sup>3</sup> [https://taronga.org.au/sites/default/files/downloads/changing\\_patterns\\_of\\_shark\\_attacks\\_in\\_australian\\_waters.pdf](https://taronga.org.au/sites/default/files/downloads/changing_patterns_of_shark_attacks_in_australian_waters.pdf)

## **The POTENTIAL 'benefits' of control**

### **1. Lives saved (human):**

Potential for one human life to be saved from unprovoked fatal shark attack every two years in Queensland. Potential for less than one person to not experience non-fatal injuries each year as a result of a unprovoked shark attack.

### **2. Employment:**

A small number of people are employed in 'managing' nets and drumlines.

### **3. Public sentiment:**

An undetermined number of people in the community (who may or may not even enter the water) 'feel safer'.

## **The 'costs' of control**

### **1. Lives lost (marine)**

#### *(a) Number of 'target' sharks killed*

In the ten years between 2005 and 2014, 3367 target sharks were caught and died/were killed as a result of the Program. This is 337 per year.

#### *(b) Inhumane killing*

Despite claims that drumlines are 'humane', it is noted that the 'apparatus is serviced every second day'. In other words, a targeted or a 'non-target' shark (or other bycatch) may be alive and struggling, or slowly drowning in a net or on the hook of a drumline for two days. This cannot be deemed 'humane' and is not acceptable.

#### *(c) Loss of species vital to marine ecology*

As with all top predators, sharks are slow breeders; it can take up to 12 years for a female great white to reach sexual maturity and, once she does, she gives birth to one pup only once every three years.<sup>4</sup> Removing slow-breeding apex predators from the food chain can have devastating impacts on the 'balance' of species. Shark removal has been linked to declines in other species. Many of the sharks caught and killed under the Program are protected species.

#### *(d) Attraction of sharks*

There is, in scientific circles, the contention that baited drumlines act to attract sharks to an area. Drumlines could, therefore, be exacerbating rather than mitigating any problem, and increasing the number of sharks killed.

#### *(e) Bycatch*

The Program inevitably results in 'unintended' deaths of non-target species, including protected species (such as dolphins, turtles and dugongs) and rays. The level of bycatch is high (increasingly so from Mackay north: Mackay ratio 24%; Townsville 31%; Cairns 38%).

There is no evidence that bycatch released alive survives for long after release. Post release survival rates vary. The NSW DPI site suggests some commonly fished species have up to 90% survival but some species do not have high post-release survival rates. For non-target hammerheads the rate is around 50%.

The survival rate for animals caught in a net or hooked for a period of up to two days (or more in inclement weather) is likely to be lowered.

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<sup>4</sup> <http://www.australiangeographic.com.au/topics/wildlife/2009/06/10-myths-about-sharks-the-truth/>

*(f) Nets*

Nets are the worst form of shark control in terms of bycatch. This is clearly demonstrated in Table 4 of the information package. A total of 102 individual marine fauna was unintentionally caught (bycatch) over the period 2005-14 in the nets off Mackay.

This compares with the 14 animals unintentionally caught on drumlines. This is especially significant when the ratio of unintended to intended catches are compared between nets (102:135) and drumlines (14:344).

Up until the time that nets were removed from Cairns beaches a similar high ratio of unintended to intended catches (194:33) was evident.

There would appear to be no argument for the continued use of nets for shark control in Mackay.

**2. Employment**

An equivalent number of jobs could be generated in community marine/shark education programs.

**3. Public sentiment:**

The following appeared on the ABC website in relation to an expert summit held in NSW in September 2015:

*Lecturer in Public Policy at the University of Sydney Christopher Neff is among the speakers and said netting and culling sharks would be out of step with public opinion.*

*Dr Neff said new research showed more than 80 per cent of people in the Ballina and Byron shires are opposed to killing sharks.*

*"The data that I've seen for the last three years whether it's from WA, whether it's from Sydney or whether it's in Cape Town or whether it's in Ballina have all said, 'don't kill the sharks'," Dr Neff said.*

*"The only people who are talking about killing the sharks usually, is the political class.*

*"The public is sophisticated and the public generally gets it, that there are better alternatives that will make them safer."<sup>5</sup>*

It is worth noting the negative response to shark killing. Public and expert concern about the introduction of shark culling in Western Australia in 2015, following a number of attacks on humans, forced the abandonment of that program.

**Control issues in north Queensland**

In north Queensland, irukandji jellyfish invade coastal waters from October to May. During this period, people can safely enter the water only within 'stinger nets'. If drumlines are to remain, it would be appropriate to restrict their use to the 'swimming season' (June to October). Placement and removal of any drumlines should occur in line with the removal and placement of stinger nets, so that drumlines are in place only during 'swimming season' (when stinger nets are removed from the water).

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<sup>5</sup> <http://www.abc.net.au/news/2015-09-29/world-experts-in-sydney-to-help-address-shark-attack-numbers/6811912>

### **Non-lethal control techniques**

Queensland is the only state in Australia that uses lethal shark control techniques as a matter of course. Despite this, the Department of Agriculture and Fisheries, in the public information package, claims that 'Over the past 53 years, the Program has invested significant resources into monitoring and trialing alternative shark control methods, including electromagnetic shark barriers. This technology is, however, still developmental and, as a consequence traditional control methods remain the most effective to reduce the risk of shark attack'.

There is no evidence of the amount of money or effort invested by DAF in assessing alternative shark control methods, and only one such method is identified. No results from the (completed) large shark behaviour research were provided.

Non-lethal shark control techniques are used in every other state in Australia and worldwide, yet DAF claims that they do not work.

Following the recent NSW fatal shark attack (of a surfer who 'broke all the rules' by paddling alone, at dusk, at a river mouth in a known shark congregation area), the NSW government arranged not for nets or drumlines but for an eco-barrier to be installed.

Refusal of the current DAF application will encourage DAF to research and identify non-lethal shark control techniques.

### **Risk assessment**

It is essential that any decision on the continuation of the Program be assessed under GBRMPA's EAM Risk Management Framework.

As is noted in that Framework, '*Risk management involves the acceptance of risks and taking actions to manage, reduce, transfer or eliminate them proportionate to the level of risk involved*'. 'Risk management principles are to be included in all ... decision making'.

Risk assessment for the Program involves determining:

- The consequences of the program – from the point of view of (a) marine life and (b) human life (in relation to the ecosystem and the perception)
- The likelihood of the consequences occurring – from the point of view of (a) marine life and (b) human life.

Using the GBRMPA EAM Risk Management Framework 2009, in relation to **marine life**, NQCC estimates the consequences as minor to moderate and the likelihood as possible to likely – giving a risk level of medium to high.

Using the GBRMPA EAM Risk Management Framework 2009, in relation to **human life**, NQCC assesses the consequences as minor (in terms of number) and the likelihood as unlikely – giving a risk level of low.

NQCC also considered the risk in relation to public perception. Despite the media attention that a shark attack would generate, the public perception would, on the basis of polling, be likely to 'side' with the shark. The consequences in terms of perception are thus estimated by NQCC as moderate. Combined with a likelihood of almost certain, this would generate a high risk of public attention.

It is essential that GBRMMPA undertake a full risk assessment, but on the basis of this non-detailed assessment it would appear that the risk to marine life exceeds the risks to human life. Public reaction could be expected to be high or extreme but short-lived and both positive and negative. Public education would mitigate any negative public perception.

## **Recommendations**

NQCC supports:

1. Refusal of the application
2. Should the application be approved, the imposition of the following conditions:
  - Immediate and permanent removal of the remaining shark nets in use in the GBRMPs
  - No increase in the number of drumlines
  - Placement of drumlines be restricted to areas protected at other times by stinger nets
  - Use of drumlines restricted to the stinger-free 'swimming season'
  - A phase-out of drumlines over the next 5 years.
3. Additional resources being dedicated to public education about 'shark safety'. This could be funded from the \$3 million annual cost of the current shark control program.



Wendy Tubman  
Coordinator

APPENDIX A: Risk assessment using GBRMPA risk assessment framework

1. RISK ASSESSMENT: IMPACT ON MARINE FAUNA

| LIKELIHOOD      | CONSEQUENCE RATING |          |          |       |              |
|-----------------|--------------------|----------|----------|-------|--------------|
|                 | INSIGNIFICANT      | MINOR    | MODERATE | MAJOR | CATASTROPHIC |
| ALMOST CERTAIN  | M                  | M        | H        | E     | E            |
| <b>LIKELY</b>   | M                  | <b>M</b> | <b>H</b> | H     | E            |
| <b>POSSIBLE</b> | L                  | <b>M</b> | <b>H</b> | H     | E            |
| UNLIKELY        | L                  | L        | M        | M     | H            |
| RARE            | L                  | L        | M        | M     | M            |

Rating assessed as MEDIUM to HIGH based on:

(1) Likelihood: **Likely** (Impact is present at either a local or wider level.

Recovery periods of 5 - 10 years anticipated) to **Possible** (Expected to occur once or more in the period of 1 to 10 years. 31-70% chance of occurring.)

(2) Consequence: **Minor** (Impact is present but not to the extent that it would impair the overall condition of the ecosystem, sensitive population or community in the long term)

**Moderate** (Impact is present at either a local or wider level. Recovery period of 5-10 years anticipated)

2. RISK ASSESSMENT: IMPACT ON HUMAN SAFETY

| LIKELIHOOD      | CONSEQUENCE RATING |          |          |       |              |
|-----------------|--------------------|----------|----------|-------|--------------|
|                 | INSIGNIFICANT      | MINOR    | MODERATE | MAJOR | CATASTROPHIC |
| ALMOST CERTAIN  | M                  | M        | H        | E     | E            |
| LIKELY          | M                  | M        | H        | H     | E            |
| POSSIBLE        | L                  | M        | H        | H     | E            |
| <b>UNLIKELY</b> | L                  | <b>L</b> | M        | M     | H            |
| RARE            | L                  | L        | M        | M     | M            |

Rating assessed as LOW based on:

1) Likelihood: **Unlikely** (Expected to occur once or more in the period of 10-100 years. 5-30% chance of occurring)

(2) Consequence: **Minor** (Impact is present but not to the extent that it would impair the overall condition of the ecosystem, sensitive population of community)

3. RISK ASSESSMENT IMPACT: PUBLIC PERCEPTION

| LIKELIHOOD     | CONSEQUENCE RATING |       |          |       |              |
|----------------|--------------------|-------|----------|-------|--------------|
|                | INSIGNIFICANT      | MINOR | MODERATE | MAJOR | CATASTROPHIC |
| ALMOST CERTAIN | M                  | M     | <b>H</b> | E     | E            |
| LIKELY         | M                  | M     | H        | H     | E            |
| POSSIBLE       | L                  | M     | H        | H     | E            |
| UNLIKELY       | L                  | L     | M        | M     | H            |
| RARE           | L                  | L     | M        | M     | M            |

Rating assessed as EXTREME based on:

(1) Likelihood: **Almost certain** (95-100% chance of occurring)

(2) Consequence: **Moderate** (Negative regional media attention and regional group campaign) to **Major** (Negative national media attention and national campaign)