



**Administrative  
Appeals Tribunal**

**DECISION AND  
REASONS FOR DECISION**

**Humane Society International (Australia) Inc and Department of Agriculture  
& Fisheries (Qld) [2019] AATA 617 (2 April 2019)**

Division: GENERAL DIVISION

File Number: **2017/3934**

Re: **Humane Society International (Australia) Inc**

APPLICANT

And **Great Barrier Reef Marine Park Authority**

RESPONDENT

And **Department of Agriculture & Fisheries (Qld)**

OTHER PARTY

**DECISION**

Tribunal: **Deputy President I Hanger AM QC**

**Senior Member A Poljak**

Date: **2 April 2019**

Place: **Brisbane**

Pursuant to section 43(1) of the *Administrative Appeals Tribunal Act 1975* (Cth), the decision under review is varied as follows:

1. The current permit is to be varied to include a condition requiring the permittee (Great Barrier Reef Marine Park Authority) to carry out the Shark Control Program in a manner that avoids, to the greatest extent possible, the lethal take of shark species;
2. The target shark list is to be removed from the current permit;

3. The current permit is to be varied to ensure that the euthanasia of sharks caught on the drum lines is only to be undertaken on animal welfare grounds, specifically when a shark is unlikely to survive release due to its condition or an injury, or which cannot be safely removed alive due to weather conditions or hooking location;
4. The current permit is to be varied to ensure sharks are attended to as soon as possible when captured on drum lines, preferably within 24 hours;
5. The current permit is to be varied to ensure all tiger, bull and white sharks caught on drum lines are tagged, using best available technology, before being released so that their movements may be monitored and researched;
6. The current permit is to be varied to ensure tagged sharks be relocated off shore, where possible, and not at site of capture;
7. The current permit is to be varied to ensure SMART drum lines are trialled and implemented on a progressive basis as soon a reasonably possible;
8. The current permit is to be varied to include a condition that requires research to be conducted into alternative non-lethal shark control measures; and
9. The current permit is to be varied to include a condition requiring research be conducted into the tiger shark population.

.....[SGD].....

Deputy President I Hanger AM QC  
(Presiding Member)

## **CATCHWORDS**

*ENVIRONMENT – Parks and reserves – Great Barrier Reef Marine Park – application for review of decision concerning issue of a permit – program to take animals that pose a threat to human life or safety – lethal shark control program – drum lines – effect on tiger shark population – whether program reduces risk of human/shark interaction – statistics – non-lethal programs considered – environmental argument – whether program causing significant harm to ecology of the Great Barrier Reef – whether tiger shark population in decline – effect of removing apex predator from ecosystem – precautionary principle – scientific working group – interim orders made*

## **LEGISLATION**

*Administrative Appeals Tribunal Act 1975 (Cth)*

*Environment Protection and Biodiversity Conservation Act 1999 (Cth)*

*Fisheries Act 1994 (QLD)*

*Great Barrier Reef Marine Park Act 1975 (Cth)*

*Great Barrier Reef Marine Park Regulations 1983 (Cth)*

*Great Barrier Reef Marine Park Zoning Plan 2003 (Cth)*

## **REASONS FOR DECISION**

**Deputy President I Hanger AM QC**

**Senior Member A Poljak**

**2 April 2019**

## **INTRODUCTION**

1. Mankind has a fear of sharks which is hardwired from an evolutionary perspective. We also fear what we cannot mitigate. In the ocean, there is a far greater risk of drowning than being attacked by a shark: but we believe we can mitigate that risk by learning to swim. To that extent we believe we are in control. No such observation can be made in

relation to an interaction with a shark. We cannot mitigate the risk of a shark interaction by being more competent. There is an understandable desire by the public to want to do something or have something done by government to protect swimmers from shark attack.

2. In 1962, following fatal and non-fatal shark attacks a shark control program was instituted in Queensland including in the Great Barrier Reef Marine Park (“**Marine Park**”). The present matter relates to that program.
3. The applicant seeks a review of a decision of the respondent, the Great Barrier Reef Marine Park Authority (“the **Authority**”) dated 2 June 2017 (as varied on 10 July 2018) affirming a decision dated 31 March 2017 to grant two permissions under the *Great Barrier Reef Marine Park Regulations 1983* (Cth) (“the **Regulations**”) (as in force at June 2009) to the Department of Agriculture and Fisheries (“**DAF**”) to use and enter the Marine Park for the following purposes:
  - to conduct a program to take animals or plants that pose a threat to human life or safety being the Queensland Shark Control Program (“the **SCP**”); and
  - to conduct a research program comprising certain specified studies (“the **research program**”).
4. The Great Barrier Reef is a national and global treasure, stretching 23,000km along Australia’s coast. The uncontested evidence is that the Marine Park contributes more than \$5 billion to the local economy, of which more than 90% comes from tourism. Tourism supports the equivalent of 64,338 full-time positions, some 90% of those being generated by the Marine Park. Swimming and snorkelling are the most popular activities undertaken by tourists within the Marine Park, and of course it is important that such persons feel secure in the water.
5. The SCP presently involves setting baited drum lines 500 meters offshore from the most popular beaches in the Marine Park and to catch and kill 19 species of shark that are on a target list; Schedule 3 of the Current Permit as Varied - Target Shark Species (“**target shark list**”). The protected areas range from south of Gladstone to just north of Cairns. The beaches at which the drum lines are installed represent 0.3% of the Marine Park coastline.

## THE COMMONWEALTH LEGISLATIVE SCHEME

6. The Marine Park is an area within the Great Barrier Reef Region that was established by the *Great Barrier Reef Marine Park Act 1975* (Cth) (“the **GBRMP Act**”). Section 2A provides that the main object of the Act is to provide for the long-term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region. Subject to that object, the other objects include to allow ecologically sustainable use of the region.

7. The term “ecologically sustainable use” in section 2A(2) of the GBRMP Act is defined in section 3AA as follows:

*“For the purposes of this act, ecologically sustainable use of the Great Barrier Reef region or its natural resources is use of the Region or resources:*

*(a) that is consistent with:*

- (i) protecting and conserving the environment, biodiversity and heritage values of the Great Barrier Reef Region; and*
- (ii) ecosystem-based management; and*

*(b) that is within the capacity of the Region and its resources to sustain natural processes while maintaining the life-support systems of nature and ensuring that the benefit of the use to the present generation does not diminish the potential to meet the needs and aspirations of future generations.”*

8. Section 3AB provides:

*“For the purposes of this Act the following principles are principles of ecologically sustainable use:*

- (a) decision-making processes should effectively integrate both long-term and short-term environmental, economic, social and equitable considerations;*
- (b) the precautionary principle;*
- (c) the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;*
- (d) the conservation of biodiversity and ecological integrity should be a fundamental consideration in decision-making;*
- (e) improved valuation, pricing and incentive mechanisms should be promoted.”*

9. The “precautionary principle” is defined as “the principle that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage”.<sup>1</sup>
10. The *Great Barrier Reef Marine Park Zoning Plan 2003* (Cth) (“**Zoning Plan**”) is the primary planning instrument for the conservation and management of the Marine Park. The Zoning Plan divides the Marine Park into eight zones, of which the following three are relevant to these proceedings; General Use Zone; Habitat Protection Zone; and Conservation Park Zone (“**three zones**”). Each zone has a defined purpose for which it may be used or entered without permission and a defined purpose for which it may be used and entered with permission. The Zoning Plan requires the written permission of the Authority to use or enter each of the three zones for the purposes of “*a program to take animals that pose a threat to human life or safety*”. The SCP is a relevant permission.
11. The Authority is responsible for the management of the Marine Park and that includes granting or refusing an application for the relevant permission referred to above. Section 7(3) of the GBRMP Act relevantly provides:
- “In managing the Marine Park and performing its other functions, the Authority must have regard to, and seek to act in a way that is consistent with:*
- (a) the objects of this Act in section 2A; and*
  - (b) the principles of ecologically sustainable use; and*
  - (c) the protection of the world heritage values of the Great Barrier Reef World Heritage Area.”*
12. Sub-regulation 74(5) of the Regulations made under the GBRMP Act provides, so far as is relevant, as follows:
- “In considering an application for a relevant permission, the Authority must have regard to:*
- (a) the objective of the zone; and*
  - ...
  - (d) the conservation of the natural resources of the Marine Park; and*
  - ...

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<sup>1</sup> GBRMP Act s 3 (definition of ‘precautionary principle’).

(f) *the likely effects of the proposed use on adjoining and adjacent areas and any possible effects of the proposed use on the environment and the adequacy of safeguards for the environment;...*"

13. If the Authority decides to grant a relevant permission, it may do so subject to a condition or conditions specified in the permission being a condition appropriate to the attainment of the object of the GBRMP Act; reg 77 (including a requirement that the person give the Authority a written undertaking in a form approved by the Authority (sub-reg 77(2)(c)).
14. A person whose interests are affected by a decision on an application for the grant of a relevant permission may ask the Authority to reconsider the decision (sub-reg 183(1)(a) and 185(1)(a)). The Authority may, after reconsidering the decision, affirm or vary the decision or substitute another decision and by regulation 187, an application may be made to this tribunal for a review of a decision of the Authority.

#### **THE STATE LEGISLATIVE SCHEME**

15. The *Fisheries Act 1994* (QLD) provides for the establishment and management of the SCP. The purpose of the SCP is to reduce the possibility of shark attacks on humans in the coastal waters of the state adjacent to coastal beaches used for bathing. The SCP in relation to the Marine Park is the subject of the reviewable decision in these proceedings.

#### **HISTORY OF THE DECISION UNDER REVIEW**

16. On 23 March 2017, the Authority and the Department of National Parks, Sport and Racing concurrently granted the DAF two permissions to use and enter particular zones within the Marine Park to:
  - (a) temporarily install up to 173 baited drum lines; and
  - (b) conduct a research program, allowing the temporary installation of up to 54 baited research devices.
17. The permits were subject to conditions. One of the conditions was: of those is that when a shark on the target shark list was caught on a baited drum line it was to be euthanised.
18. On 21 April 2017, the applicant requested the Authority to reconsider its decision to issue the permit.

19. On 2 June 2017, the Authority affirmed its original decision.
20. On 31 May 2018, the DAF requested a variation to the current permit on the advice of a Scientific Working Group, to remove seven shark species from the target shark list which was contained in Schedule 3 of the permit.
21. On 5 July 2018, the tribunal remitted the original decision under review pursuant to section 42D(1) of the *Administrative Appeals Tribunal Act 1975* (Cth) (“the **AAT Act**”) to the Authority for the purpose of considering that request.
22. On 10 July 2018, the Authority reissued the permit with the requested variation namely that seven shark species were removed from the target shark list; Permit Number G17/33288.1 (“**Current Permit**”).
23. Therefore, pursuant to section 42D(3) of the AAT Act, the application is taken to be an application for a review of the decision made on 2 June 2017 (as varied on 10 July 2018) to affirm the original decision to issue the current permit.
24. It is not suggested that the applicant does not have standing to bring these proceedings.

#### **CURRENT ISSUES FOR DETERMINATION**

25. All the parties agree that this tribunal is required to determine the following two issues:
  1. Whether the current permit should have been issued by the Authority, which authorises DAF to:
    - (a) carry out a program to take animals that pose a threat to human life or safety – being the SCP; and
    - (b) conduct a research program – being various research projects contributing to one or more of the following objectives:
      - (i) marine animal tagging and tracking;
      - (ii) retention of animals or samples of animals taken in the SCP apparatus; or

(iii) trial of new technologies, equipment configurations, baits and hook types to improve the effectiveness of the SCP and minimise bycatch, in particular General Use zones, Habitat Protection zones and Conservation Park zones as those zones are located in the AGRMP Section.

2. Whether the current permit should have been issued by the Authority in its current form, including but not limited to:

- (a) issuing the current permit for a period of ten (10) continuous years (including in the Marine Stinger season);
- (b) allowing the installation of 173 traditional baited drum lines in the AGRMP section for a period of ten (10) years;
- (c) allowing the installation of a further two (2) baited research devices (including drum lines) at each authorised drum line location in the AGRMP Section for a period of ten (10) years;
- (d) authorising the killing of 19 shark species on the target shark list set out in Schedule 3 of the current permit;
- (e) allowing the inclusion of shark species on the target shark list that do not pose a threat to human life or safety;
- (f) allowing any marine animal to remain on a drum line for up to two (2) days during favourable weather conditions, and for an indeterminate period in inclement weather; and
- (g) allowing the use of acoustic transmitters.

26. The applicant's primary case is that the decision under review should be set aside and substituted with a new decision to refuse the continuation application. In the alternative, the applicant asks that the tribunal vary the current permit. The tribunal has the power to vary the permit including to prohibit the killing of any shark species noting that it was open to the respondent to impose that condition pursuant to sub-regulation 77(2)(c) of the Marine Park Regulations.

27. The applicant's case has essentially two limbs. The first is that there is no scientific basis for the proposition that a lethal SCP reduces the risk of human/shark interaction at anything other than a theoretical level. It argues that there is no point in conducting a lethal program if the effect of the lethal program is not to reduce the risk of unprovoked shark bites. The second limb is that a lethal SCP risks causing significant harm to the ecology of the reef because of the impact of the declining tiger shark population and flow on effects of removing an apex predator from the ecosystem.
28. The respondent's case also has two principle limbs. The first is that in the almost 60 years in which the SCP has been operating there has only been one fatal attack at beaches which host drum lines. It asserts that this proves the drum lines are effective in protecting the public. The second is that the DAF has established a highly qualified Scientific Working Group ("**SWG**") to advise the Department on the latest research and development in technology in relation to shark control.
29. The respondent also submits that it would be appropriate, given the research that has emerged since late 2018, to vary the conditions of the current permit as varied to be prescriptive about the prioritisation of research into tiger shark sustainability in the Marine Park and the review by the SWG of the species permitted to be euthanised under the permission.
30. The DAF asserts that the need for and success of the SCP is demonstrated by four matters:
  1. the rate of dangerous shark encounters in Australia is increasing;
  2. of the 186 shark attacks reported in Australia between 1990 and 2009, 43 occurred in Queensland resulting in 32 injuries and five deaths;
  3. in November 2018 in Cid Harbour, three shark attacks occurred in a matter of weeks, with one person killed and serious injuries inflicted upon others, including a child, whose limb was amputated. That area was not protected by the SCP; and
  4. throughout the 56 years that the SCP has operated no fatal shark attack has ever occurred on the Marine Park's protected beaches yet in unprotected parts of the Marine Park there have been 57 shark attacks and 11 deaths.

31. The DAF submits that the decision under review should be affirmed and that the State should continue to implement the SCP in accordance with its permit. It submits:
- (a) the evidence does not establish that the currently protected beaches of the Marine Park will remain free from fatalities or any other shark related injuries if the permit is refused or made subject to the proposed conditions;
  - (b) the environmental impact of the SCP is materially insignificant;
  - (c) the applicant's proposed conditions are financially and logistically impracticable;
  - (d) the technologies for which the applicant advocates have no proven capacity for preventing shark attacks or deaths in the Marine Park, making them unsafe for deployment; and
  - (e) to adopt the applicant's proposal would unjustifiably and inevitably expose human beings to an otherwise avoidable risk.

#### **The Drum Lines**

32. A drum line consists of a string of floats connected to the substratum via a single anchor and chain, with a 14/0 baited hook attached to the outer float via a two meter chain trace. They are deployed in 173 locations and are normally inspected every second day but on the Capricorn Coast they are inspected 208 times per year. The average annual catch of tiger sharks between 2001 and 2016 was 144 per annum.

## The Sharks

33. The sharks that are on the target shark list are:

Common name	Scientific name
Australian Blacktip	<i>Carcharhinus tilstoni</i>
Big Nose Whaler	<i>Carcharhinus altimus</i>
Blue Shark	<i>Prionace glauca</i>
Bull Whaler	<i>Carcharhinus leucas</i>
Common Blacktip Whaler	<i>Carcharhinus limbatus</i>
Dusky Whaler	<i>Carcharhinus obscurus</i>
Great Hammerhead	<i>Sphyma mokarran</i>
Grey Reef Whaler	<i>Carcharhinus amblyrhynchos</i>
Long Nose Whaler (Spinner Shark)	<i>Carcharhinus brevipinna</i>
Longfin Mako	<i>Isurus paucus</i>
Shortfin Mako	<i>Isurus oxyrinchus</i>
Oceanic Whitetip Whaler	<i>Carcharhinus longimanus</i>
Pigeye Whaler	<i>Carcharhinus amboinensis</i>
Sandbar Whaler	<i>Carcharhinus plumbeus</i>
Sharptooth Shark/ Lemon shark	<i>Negaprion acutidens</i>
Silky Whaler	<i>Carcharhinus falciformis</i>
Silvertip Whaler	<i>Carcharhinus albimarginatus</i>
Tiger Shark	<i>Galeocerdo cuvier</i>
White Shark	<i>Carcharodon carcharias</i>

34. There are three species in Australia that give any real cause for concern in regards to safety. They are the (great) white shark, the tiger shark and the bull shark. In a 40 year period there have only been five species of shark that have interacted with people. They are the tiger shark, the bull shark, the white tip reef shark, the grey reef shark, and the wobbegong shark. Of those five species, the last three have only been associated with one shark incident. The main safety concern in the reef area relates to the tiger shark and the bull shark. The evidence in this matter primarily focused on the tiger shark. Other sharks on the target shark list are there because they are known to have caused fatalities elsewhere in the world however; they are not known to have caused fatalities in the Marine Park.

### **The Expert Witnesses**

35. The tribunal had the advantage of hearing from three very experienced experts in the field. There was not a great deal of disagreement between them.
36. Dr Williams Robbins has a doctorate in marine biology and has been researching sharks for the last 18 years.
37. Dr Leah Gibbs has a doctorate in the field of environmental science and environmental social science. She has been working on human interaction with sharks and human relationships with the ocean for approximately seven years.
38. Associate Professor Daryl McPhee has a doctorate in fish ecology and has also undertaken significant research and consultation in respect of sharks and human shark interaction.

### **THE SCIENTIFIC ARGUMENT**

#### **The statistics**

39. Dr Robbins said that globally there are about 75 shark interactions per year and about 10 to 12 of those are fatal. The term “interaction” refers to a situation where a shark and a person come together. It may be fatal or it may be tooth marks in a surfboard. He said that in the last seven years in Australia there has been an average of about 23.5 shark interactions per year and of those 15.6 have been unprovoked. By the term “unprovoked” he means that they did not involve fishing, spearing or activities that encourage a shark attack.
40. Nationally, there has been a seven-year average of 1.6 fatalities per year. In Queensland there has been an average of 2.3 shark interactions per year over the last seven years and only of those one was fatal. There is no separate figure that relates to the Marine Park. Most of the shark incidents have occurred off the islands. They are not actually in the coastal water where the SCP operates. Dr Robbins said that to put the interactions into perspective one must consider that the tens of millions of people hours per annum spent in the water in Australia, only resulted in 2.3 interactions. The chances of a shark bite are one in millions. He also pointed out that 83% of the drum lines are at beaches

where there has never been a recorded fatality - before or after the SCP was instituted in 1962. Those records go back to 1852.

41. Dr Gibbs gave evidence about human/shark interactions. She described how her research covered a 20 year timeframe and revealed that 1.1 people per year were killed in Australia by sharks and another 5.9 were injured. She said that the numbers suggest that shark bite incidents are increasing but that if one considered a different time frame over 150 years, the first 75 years saw significantly more shark bites than in the most recent 75 years. The figures vary with the timeframe involved. In 2018, the International Shark Attack File which was recently published showed a steep decline in shark bite incidents globally.
42. Associate Professor McPhee confirmed that the average fatality from shark bites in Australia per year is between 1.1 and 1.6. He said that the numbers involved are so low that statistically it is very hard to draw conclusions about the number and frequency of shark incidents. Interestingly, Associate Professor McPhee pointed out that to put the figures into perspective, cows were responsible for more deaths per annum than sharks.
43. Dr Robbins referred to research by Jessica Meeuwig of the University of Western Australia. She focused on fatalities and said that in the 1920s the number of fatalities in Queensland was high and then dropped progressively over the next 40 years. It dropped consistently until about 1960 when the Queensland SCP was introduced, and therefore, he argues it's hard to say that the program in Queensland was responsible for the lack of fatalities.
44. Dr Robbins said that an increasing number of authors in scientific journals suggest that the chance of a shark incident related not so much to the abundance of sharks but to the abundance of people as well as other external factors such as local developments, climate change and anomalous weather conditions.

**The evidence from other shark control programs and their change to non-lethal programs**

45. It is plain from the evidence given in these proceedings that Queensland's lethal SCP is out of step with national and international developments.

46. There are three big shark control programs in the world: the New South Wales program, the Queensland program, and the Kwa Zulu Natal program in South Africa. All initially began as lethal programs. However, in 1990 the South African program was changed to a non-lethal program where the sharks were released if possible.
47. In 2008-9, the New South Wales program became non-lethal, and while there are still shark deaths in the programs, they are not deliberately killed. Queensland is the only place that continues to deliberately operate a permit where sharks are automatically euthanised if caught on the drum lines. Elsewhere, they are tagged and released alive. Neither the South African program nor the New South Wales program has reported an increase in shark incidents as a result of changing to a non-lethal program.
48. Dr Robbins expressed the view that there would probably not be a Queensland beach that does not have a shark somewhere around and said that if the SCP in Queensland changed its philosophy from targeted killing of sharks to releasing them that would not make a difference in any non-theoretical way to the risk of a human shark interaction. That is the experience in both South Africa and New South Wales. Sharks that have been caught and released have not been identified or suspected of being involved in subsequent incidents and nor have local shark incident rates increased in either of these long-running programs which were changed from a euthanasia policy to a release where possible policy.
49. In Hawaii between 1959 and 1976 there were six different shark control programs running. Over those 17 years, 4668 sharks were killed; 554 of those were tiger sharks. Interestingly, the researchers found no change in the rate of shark incidents in Hawaii before or after the program. Dr Robbins said that research into the New South Wales program came to a similar conclusion.
50. Associate Professor McPhee gave evidence that he had recommended against a lethal shark control program in Western Australia and had written a report identifying studies and issues which tended to indicate that there wasn't any evidence that drum lines worked to reduce human shark interactions. He said that he would never advocate starting a lethal shark program from scratch and that it was highly plausible that if drum lines were retained, but no more sharks were killed, there would not be an increase in unprovoked shark interactions.

51. Dr Robbins pointed out that where SCPs were instituted, there was generally an increase in life-saving patrols, which means that people are actually swimming between the flags in a smaller area and there is more vigilance in that area. There is probably a reduction in shark incident rates at those beaches caused by better observation rather than by drum lines.
52. Furthermore, both Dr Robbins and Associate Professor McPhee agreed that there is no correlation between the abundance of sharks in the local area and the risk of a shark bite.
53. In 2014, the Western Australia Government put in a three-month drum line program to try to catch sharks. It was a largely lethal program. 164 tiger sharks were captured off Perth metro and Margaret River beaches and of those 64 were killed. That meant that there was a significant population of tiger sharks just off the beaches of Perth and Margaret River; but a tiger shark had not been associated with a shark incident in Western Australia for at least 45 years. Contrary to what one would expect, the number of shark incidents did not appear to increase with the number of sharks in an area.
54. Dr Robbins concluded that the scattergun approach of randomly taking sharks out of the ecosystem using drum lines is just killing sharks which would never have bitten anybody. It does not change the risk because the attack itself is random.
55. In evaluating the scientific evidence one must not lose sight of the superficially attractive albeit non-scientific approach of the DAF which points to the fact that there has not been a fatality at a protected beach in the Marine Park since 1962 whereas there have been fatalities at non-protected beaches. The problem with that argument is that there have been no negative shark interactions recorded at many beaches where there is no SCP; and fatal shark incidents have occurred at beaches outside the Marine Park where a SCP is in place. The statistics show that one in five of the fatal shark attacks in Queensland occurred at SCP controlled beaches even though those beaches are only a very small part of the coastline. That doesn't prove anything but it rather weakens the logic of the argument that the SCP has proven a success because there have been no attacks on SCP controlled beaches in the Marine Park.
56. We are satisfied from the scientific evidence that, other than from the truly theoretical viewpoint, drum lines do not reduce the risk of shark attack on the individual.

### **Options that do not involve killing sharks**

57. There are various options available that do not involve the killing of sharks.
58. Dr Robbins suggested that the precautionary principle requires that all possible steps should be taken to reduce unnecessary impact on shark stocks and put forward a number of options that do not involve killing sharks. His favoured option is to tag and release all sharks or at least tag and release small sharks.
59. At present drum lines are checked every second day or more frequently. Dr Robbins said that tiger sharks could survive a day or two on the hook but would be in a poor condition. If the sharks are to have the best chance of survival the drum lines would have to be checked daily. While this would obviously involve some expense it would not be significant. Furthermore, given the fact that there are 173 drum lines presently in position and an average of 144 tiger sharks captured per year it is likely that some drum lines could be removed as having served no useful purpose. We are not aware whether there are any drum lines that in the nearly 60 years of operation have failed to hook a shark but doubtless there are some that have captured very few.
60. A second approach designed to minimise the effect on the shark population is to remove the drum lines during the stinger season. That would not increase the risk to water users who during that part of the year are urged to swim inside nets.
61. It was suggested to Associate Professor McPhee that snorkelling continues to be undertaken during the stinger season and that a stinger net would not provide protection to such swimmers. However snorkelers are more likely to be found throughout the entire Marine Park rather than at the beaches. The SCP is designed to protect swimmers at beaches and not persons in the water away from the beaches. The applicant submits that a fall-back position is to remove the drum lines during stinger season.
62. A further option to avoid the necessity of killing the sharks is to install SMART (Shark Management Alert in Real Time) drum lines that use the same equipment currently used with the addition of an alert system to ensure the relevant parties are notified when something is caught.

63. We accept that such a program would be extremely expensive, but Dr Robbins suggests that it could be implemented progressively.
64. The New South Wales program employs SMART drum lines and on-call shark contractors to access the drum lines and release sharks alive in a timely fashion. The potentially dangerous species of sharks are acoustically tagged where possible to provide movement and distribution data. Since implementation in 2015, there have been no instances identified with released sharks interacting with the public.
65. Since 1989 all sharks captured in the South African shark control program have been tagged and released alive when possible. The sharks were rarely seen again and had a typically low recapture rate. Less than 3% of recaptured tiger sharks were recaptured within 50 km of where they were released.
66. Dr Robbins' third suggested option is to release small sharks less than 2 meters long. That size is below that associated with human fatalities in Australia and would enable the shark to breed.
67. Another option that he suggested is to acoustically tag tiger sharks, bull sharks, and white sharks. The tag would transmit a unique identification code which can be detected by receivers from a distance of up to 400 meters away. Thus, real-time alerts could be provided to lifesavers. The technology was implemented in Western Australia in 2009 and is now being implemented in NSW.

#### **THE ENVIRONMENTAL ARGUMENT**

68. The SCP predominantly catches tiger sharks and they comprise 38% of the SCP catch. Between 2001 and 2016, 2304 tiger sharks were killed as a result of the SCP. The applicant argues that killing tiger sharks is reducing their population on the reef and is having a deleterious effect on the ecosystem.
69. Associate Professor McPhee says that the local abundance of tiger sharks is highly likely to be reduced by the activities of the SCP but argues that that does not necessarily equate to the sustainability of the stock being compromised as a whole. The tiger shark is more resilient to fishing pressure than a number of other shark species because of its relative high fecundity, juvenile survivorship and fast growth rates. He argues that illegal

catches by foreign fishing vessels are a substantial and known threat to sustainability. Other experts do not disagree with that proposition. It may be the case that illegal activities do more harm to the shark population than the SCP but that is irrelevant for present purposes. The real issue is whether the tiger shark population is diminishing and if so, whether that is significant however it may be caused and whether anything can be done about it.

70. The tiger shark is one of the largest predatory shark species and therefore one of the most important shark species in the Great Barrier Reef ecosystem. They are also the most commonly caught species in the Marine Park under the SCP. Dr Robbins argued that the presence of tiger sharks influences prey behaviours and that the importance of the ecological balance which tiger sharks impose is becoming increasingly recognised. In his opinion if severe reductions in their numbers occur, the population recovery would take many decades to restore due to the fact that the shark breeds only every three years. The effect that the reduction in numbers of the tiger shark, as an apex predator, might have on the reef is far from clear. It is suggested that it may cause a trophic cascade. A trophic cascade occurs where a system changes, usually for the negative, because a species has been removed, and that removal changes the interactions of the species below them. For example: research has shown that in Western Australia the presence of the tiger shark changes the behaviour, the movements and feeding patterns of turtles, dolphins and dugongs as they try to avoid being eaten by the shark whilst going about their daily business. Dr Robbins opines that there is going to be a whole series of additional effects caused by removal of an apex predator such as the tiger shark.
71. Unfortunately, a lack of targeted research does not establish whether a trophic cascade has occurred in relation to the tiger shark on the reef.
72. Dr Robbins said tiger shark catches have been variable but overall stable in the Marine Park since 2001, however significant declines in tiger shark drum line catch rates have been identified in three of the Marine Park SCP regions since the early 1990s. A similar pattern of significant tiger shark decline has also been found in southern SCP drum line catches outside the Marine Park and also in New South Wales. He says that the Marine Park SCP must be considered a significant source of mortality for the tiger shark in Queensland waters. There has also been a significant decrease in the average size of the sharks caught in both programs. He concludes that overfishing of tiger sharks may be

occurring on the Australian East Coast. He referred to a study by Roff and others that showed that the catch per unit effort of tiger sharks in the SCP had dropped by 74% since the program began which is indicative of a large reduction in the tiger shark population in Queensland including all areas in the Great Barrier Reef. Of course, a certain amount of that is caused by commercial and illegal fishing.

73. A risk assessment conducted for the purposes of issuing a permit said, "it is not clear whether the current take of tiger sharks from the Marine Park is sustainable".
74. Dr Robbins was asked further about the reduction in tiger shark numbers and referred to three pieces of research in 2011, 2012 and 2018 which led him to conclude that there has been a 74% reduction in tiger shark population. He referred to the latest (non peer-reviewed as yet) article by Brown and Roff (well-regarded researchers) which asserts that there is a 64% drop over the last 3 generations in Queensland. He conceded that there are other research articles indicating that tiger shark abundance has remained steady or even increased and that the shark control programs do not affect abundance but said that it was research in 2009 and was out of date with the later research. He disagrees with the suggestion that tiger shark abundance has remained steady or increased and points out that there are regional differences and that in five areas in the Great Barrier Reef Marine Park where the program was operating research found that three of those areas had a marked decline in catch per unit effort.
75. Associate Professor McPhee does not accept the extent of the decline is amounting to 64% or 74% and says that there are matters that have not been effectively addressed in the research but does accept that there has been a decline in the tiger shark population. He attributes the decline to commercial and illegal fishing activities as well as the SCP. It should also be noted that for the majority of its duration the SCP was conducted using mesh nets which have now been abandoned. They had the capacity to take multiple target sharks simultaneously in addition to by catch and from that point of view would take more sharks than would be taken by drum lines.
76. We are prepared to accept that without being precise, there is a significant decline in tiger shark population in the Marine Park area which is multifactorial and that the SCP makes a significant contribution to that decline.

77. The International Union for Conservation of Nature lists the tiger shark as “near threatened”. This means the population of the shark has been evaluated against certain criteria “but does not qualify to be described as critically endangered, endangered or vulnerable now, but is close to qualifying or is likely to qualify in the near future”.

#### **THE PRECAUTIONARY PRINCIPLE**

78. The main object of the GBRMP Act is to provide for the longer-term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef region.

79. The other objects of the GBRMP Act contained in section 2A, such as public enjoyment and appreciation; recreational, economic and cultural activities; and research, are secondary and subject to the main object.

80. The DAF suggests that the term “biodiversity” in that phrase demands attention. By section 3(1A) of the GBRMP Act it is defined to have the same meaning as in the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (“the **Conservation Act**”). The Conservation Act defines “biodiversity” to mean: “the variability among living organisms from all sources (including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part) and includes:

- (a) diversity within species and between species; and
- (b) diversity of ecosystems”.

81. The DAF further submits that human beings form part of the “biodiversity” which the GBRMP Act seeks to protect and that therefore the protection of humans in their interaction with and enjoyment of the rest of the environment is part of the main object of the Act. We find that argument difficult to accept. Human beings cannot be regarded as part of the biodiversity of the reef and in need of long-term protection.

82. However there is little doubt that the GBRMP Act makes provision for the use of the Great Barrier Reef region for the purposes of public enjoyment and appreciation and recreational, economic and cultural activities. That use is by people. We do not find and indeed it has not been suggested that the Authority cannot authorise the SCP in the

Marine Park, as long as it is consistent with the main object of the GBRMP Act. As has been rightly pointed out by the DAF, the zoning plan expressly contemplates permission being granted for a program to take animals that pose a threat to human life or safety or the use and amenity of a part of the zone or an adjacent area.

83. The precautionary principle means that the lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats of serious or irreversible environmental damage.<sup>2</sup> Accepting as we do the complete integrity of the witnesses who gave evidence before us, it is fair to say that there is a “lack of full scientific certainty” that the killing of the tiger sharks is actually having an adverse effect on the reef within the Marine Park. However, it is common ground that the Great Barrier Reef is at present under stress for a number of reasons particularly from climate change, water quality, coastal development, and fishing impacts. We see the precautionary principle as requiring decision makers to proceed with caution “where there is a threat of serious or irreversible environmental damage”.

84. Dr Robbins considers that tiger sharks are an apex predator in the Marine Park, and one of the most important shark species in the Great Barrier Reef ecosystem. Removing tiger sharks from the reef environment will directly or indirectly impact the abundance of a wide range of prey species including other sharks, fishes, marine mammals, turtles, and seabirds.

85. In his report Dr Robbins said:

*“Even if an environment is thought to possess sufficient redundancy to replace a shark’s ecological niche in the event its population is reduced, the precautionary principle suggests this situation should be avoided where possible. The majority of medium-large sharks (greater than 1.6m) in Australia have slow reproductive rates, maturing late and breeding only biannually. As such, removal of such species may take years to reverse. Should unforeseen environmental issues arise due to depletion of a shark species, these problems may persist for many years. Ecosystems under stress are more susceptible to further degradation from other environmental stressors; thus, a lack of sharks may exacerbate other ongoing environmental issues. These flow-on effects are not easy to predict or remedy, and unlike terrestrial animals, re-introducing sharks to a local environment is logistically and economically unfeasible for most species. As such, the best approach is to ensure shark populations are retained in the first place.”*

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<sup>2</sup> Section 3 of GBRMP Act.

86. Associate Professor McPhee said that the local abundance of tiger sharks was highly likely to be reduced by the activities of the SCP but he did not say that the sustainability of the tiger shark population was compromised. He did admit that the decline was “significant” and that one shouldn’t wait until something became threatened before behaving in any precautionary way. It was unclear whether the take of tiger sharks to date could be demonstrated to have resulted in trophic cascade.
87. Given the importance of: the Great Barrier Reef Marine Park; the unchallenged evidence that it is at present the subject of substantial stress; the fact that, whether or not it is as great as some think, the population of tiger sharks in areas of the reef has decreased significantly; and the fact that trophic cascade may occur with the reduction in a population of an apex predator, we think it appropriate to apply the precautionary principle by not contributing to the culling of tiger sharks.

#### **THE SCIENTIFIC WORKING GROUP (SWG)**

88. The permit issued by the respondent to the DAF imposed a condition with respect to the SCP that the permittee was required to establish and fund a Scientific Working Group (“**SWG**”) for the duration of the permit to determine appropriate research into non-lethal alternatives and non-target species reduction strategies.
89. The SWG was established. It is an independent body comprised of very eminent people. That enables the body to make scientifically informed recommendations to safeguard ecological sustainability and to conduct appropriate research. It is specifically tasked with determining “appropriate research into non-lethal alternatives and target species reduction strategies” and developing a “research strategy including research priorities relevant to shark control activities” in the Marine Park. Its research priorities include analysing SCP data in relation to the tiger shark catch in the Marine Park for the purpose of identifying its potential impact on the sustainability of tiger shark populations as well as research including the possibility of closing the SCP in the Marine Park during stinger season.
90. The respondent points to the effectiveness of the SWG as being evident from the steps taken to vary the current permit to reduce the target species list on the recommendations of the SWG before the current proceedings were heard. In particular, the respondent submits it has the authority to stop, suspend or modify the SCP if it is causing or likely to

cause environmental harm and that this provides an adequate safeguard to ensure that the program remains consistent with principles of ecologically sustainable use.

91. Given the ongoing research of the SWG, the respondent submits it would be appropriate to vary the conditions of the current permit to require the prioritisation of research into tiger shark sustainability in the Marine Park and a review by the SWG of the species permitted to be euthanised under the permission. The respondent has provided a proposed amended condition. Apart from that, the respondent submits that the evidence does not support the conclusion that the SCP is having an unacceptable impact on the Marine Park ecosystem and further that the SWG is the body best placed to consider and make recommendations as to how the SCP can continue to reduce its impact on the Marine Park ecosystem, particularly through the introduction of alternative non-lethal technologies.
92. While accepting that the SWG is the body best placed to consider and make recommendations about the ecosystem of the Marine Park, its existing research does not appear to be directed at research in relation to the impact of the SCP on tiger sharks at this point in time. It may take years to conduct such research which will inevitably depend on funding.
93. The SCP has been in existence for approximately 60 years. At no time was a committee similar to the SWG established by the State. The SWG was only established because of the requirement imposed by the respondent. While having the greatest respect for the members of the SWG, one cannot have confidence that its recommendations will necessarily be followed if they are out of step with public sentiment. Ms Claire Andersen, Executive Director in the DAF, made it clear that the attitude of the State was that the safety of swimmers had to be absolutely guaranteed before the State would be prepared to remove drum lines. No one has suggested that safety can be guaranteed. A shark attack is a random event which may occur at any time at any place whether drum lines exist or not.

## DECISION

94. 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. Most compelling is the evidence of Associate Professor McPhee who gave evidence that he would never recommend a lethal program, and could never imagine advocating for a lethal shark program anywhere. He agreed that it was “*highly plausible*” that if the SCP became non-lethal tomorrow, we would see “*no discernible change in unprovoked shark bites, in particular fatalities.*”
95. Having regard to the nature and extent of the environmental harm caused by the SCP; in particular its impact on the tiger shark and the ecosystem of the reef, we have concluded that there has been a significant reduction in tiger shark population within sections of the Marine Park; and that the reduction is a cause for concern. Applying the precautionary principle it is an even greater cause for concern being the Marine Park is in a World Heritage listed area.
96. We are satisfied that the euthanasia of any species of sharks, significantly the tiger sharks, that have been caught on drum lines should be a last resort and not occur as a matter of practice.
97. For the reasons outlined above in this decision we find that the terms of the current permit are inconsistent with the objects of the GBRMP Act and the criteria set out in sub-regulation 74(5) of the Regulations. We therefore make the following orders pursuant to section 43(1) of the AAT Act:
1. The current permit is to be varied to include a condition requiring the permittee (Great Barrier Reef Marine Park Authority) to carry out the Shark Control Program in a manner that avoids, to the greatest extent possible, the lethal take of shark species;
  2. The target shark list is to be removed from the current permit;
  3. The current permit is to be varied to ensure that the euthanasia of sharks caught on the drum lines is only to be undertaken on animal welfare grounds, specifically when a shark is unlikely to survive release due to its condition or an injury, or

which cannot be safely removed alive due to weather conditions or hooking location;

4. The current permit is to be varied to ensure sharks are attended to as soon as possible when captured on drum lines, preferably within 24 hours;
  5. The current permit is to be varied to ensure all tiger, bull and white sharks caught on drum lines are tagged, using best available technology, before being released so that their movements may be monitored and researched;
  6. The current permit is to be varied to ensure tagged sharks be relocated off shore, where possible, and not at site of capture;
  7. The current permit is to be varied to ensure SMART drum lines are trialled and implemented on a progressive basis as soon as reasonably possible;
  8. The current permit is to be varied to include a condition that requires research to be conducted into alternative non-lethal shark control measures; and
  9. The current permit is to be varied to include a condition requiring research be conducted into the tiger shark population.
98. We do not propose to make any orders about the duration of the permit noting that the SCP moving forward will be non-lethal, research is to be undertaken into non-lethal alternatives, and the tiger shark populations and introduction of SMART drum lines will be implemented on a progressive basis. These aspects of the SCP require time.

