



Appeals Convenor

Environmental Protection Act 1986

REPORT TO THE MINISTER FOR ENVIRONMENT

**APPEALS IN OBJECTION TO THE ENVIRONMENTAL PROTECTION AUTHORITY
DECISION NOT TO ASSESS A REFERRED PROPOSAL**

**NON-LETHAL TRIAL OF SMART DRUM LINES
NEAR GRACETOWN, SHIRE OF AUGUSTA-MARGARET RIVER**

PROPONENT: DEPARTMENT OF PRIMARY INDUSTRIES AND REGIONAL DEVELOPMENT

Appeal Number 006 of 2019

February 2019

Appeal Summary

This report relates to an appeal lodged in objection to the decision of the Environmental Protection Authority (EPA) not to assess a proposal by the Department of Primary Industries and Regional Development (DPIRD; proponent) to measure the effectiveness of 'shark management alert in real time' (SMART) drum lines as a non-lethal shark hazard mitigation tool to reduce shark attacks, under Part IV of the *Environmental Protection Act 1986* (EP Act).

After considering the referral, the EPA considered that the proposal is unlikely to have a significant effect on the environment, and determined not to assess the proposal and gave public advice.

In summary the appellant submitted that the EPA should assess the proposal with particular regard for scientific uncertainty regarding the white shark population, direct impacts to marine fauna, and behavioural changes caused by tagging. The appellant is seeking for the Minister to remit the proposal to the EPA for formal assessment at the level of Public Environmental Review.

In responding to the appeals, the EPA considered that the proponent's management measures and procedures were commensurate with the potential risks to target and non-target animals associated with the non-lethal trial.

Having regard for the information provided during the appeals investigation, including information provided by the appellant, the proponent and the EPA, the Appeals Convenor considered that the EPA's conclusion that the environmental impacts are not so significant as to warrant formal assessment is supported by the available evidence and its decision not to assess the proposal was justified.

Recommendation

The Appeals Convenor recommended that the appeals be dismissed.

INTRODUCTION

This report relates to an appeal lodged in objection to the decision of the Environmental Protection Authority (EPA) not to assess a proposal by the Department of Primary Industries and Regional Development (DPIRD; proponent) to measure the effectiveness of 'shark management alert in real time' (SMART) drum lines as a non-lethal shark hazard mitigation tool to reduce shark attacks, under Part IV of the *Environmental Protection Act 1986* (EP Act).

The trial is to be located approximately 500 metres (m) offshore along an 11.5 kilometre (km) stretch of coast near Gracetown in the Shire of Augusta-Margaret River. The location and extent of the proposal are shown in Figures 1 and 2 (sourced from the proponent's referral document¹).

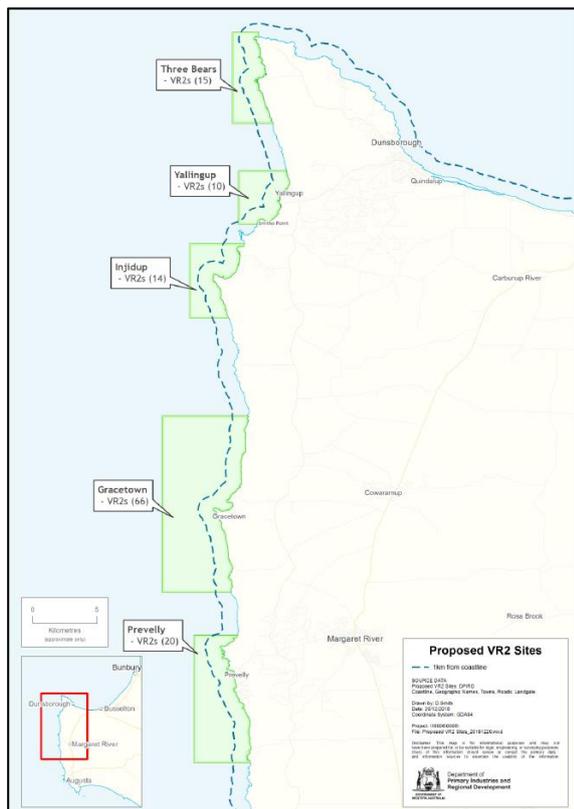


Figure 1: Proposed areas for VR2 acoustic receiver placements



Figure 2: Proposed area of operation and indicative SMART drum line locations

Background

The proposal comprises a catch, tag, relocate and release program for white sharks (*Carcharodon carcharias*) by setting of 10 drum lines daily, and deploying 125 VR2 acoustic receivers, over a 15 month period, to better understand white shark movements.²

The EPA determined not to assess the proposal on the basis that it '... considers that the proposal is unlikely to have a significant impact on the environment and does not warrant formal assessment', and gave public advice which recommended that '... the community is regularly informed of the ongoing implementation of the trial, including the results of reviews and any modifications to the trial in response to the reviews'. It was against this decision that the appeal was received.

This document is the Appeals Convenor's report to the Minister for Environment under section 109(3) of the EP Act.

¹ Available at: <http://www.epa.wa.gov.au/proposals/non-lethal-trial-smart-drumlines>

² Proponent referral form, page 1.

OVERVIEW OF APPEAL PROCESS

In accordance with section 106 of the EP Act, a report was obtained from the EPA in relation to the issues raised in the appeal. The proponent was also given the opportunity to address the matters raised in the appeals. During the appeal investigation, the Appeals Convenor consulted with the appellant to discuss the matters raised in further detail.

The environmental appeals process is a merits-based process. For appeals in relation to an EPA decision not to assess, the Appeals Convenor normally considers questions of environmental significance, relevance of factors, additional information not considered by the EPA, and whether other approvals processes can adequately address the relevant environmental factors without the need for formal assessment by the EPA. The level of public interest may also be relevant.

OUTCOMES SOUGHT BY APPELLANT

The appellant is seeking for the Minister to remit the proposal to the EPA for formal assessment at the level of Public Environmental Review (PER).

GROUND OF APPEAL

The appellant submitted that the EPA should assess the proposal with particular regard for:

- scientific uncertainty regarding the white shark population;
- direct impacts to marine fauna; and
- behavioural changes caused by tagging.

The appellant also raised the matter of social values, however as this matter is not directly related to environmental impacts or the EPA's decision it has not been considered in detail in this report and is described under 'Other Matters'.

GROUND 1: UNCERTAINTY REGARDING THE WHITE SHARK POPULATION

The appellant submitted that the EPA should have regard for the uncertainty regarding the white shark population and the impacts of the proposal on the current population, noting that the former State Government's 2014 three-year drum line proposal was rejected on this basis. The appellant submitted that the proposal is likely to impact on the southern-western Australian population of white sharks for the following reasons:

- white sharks are vulnerable worldwide and in Australia have been the focus of the *Recovery Plan for the White Shark (Carcharodon carcharias)*³ (Recovery Plan);
- there is no reliable evidence regarding the total population of white sharks due to the lack of juvenile data and it will take another 10 years to determine this, and because of this uncertainty the precautionary principle must apply and no action taken that could put these animals at risk;
- according to Bruce et al. (2018),⁴ there are as few as 760 adult white sharks in southern western Australia, and there has been no significant increase in this number since their protection; and
- a number of sharks are likely to die due to the trial, which will put numbers and the environment (through removal of apex predators and detrimental cascading effects) in further peril.

³ Department of Sustainability, Environment, Water, Population and Communities (2013) *Recovery Plan for the White Shark (Carcharodon carcharias)*. Commonwealth of Australia.

⁴ Bruce, B., Bradford, R., Bravington, M., Feutry, P., Grewe, P., Gunasekera, R., Harasti, D., Hillary, R. and Patterson, T. (2018) *A national assessment of the status of white sharks*. National Environmental Science Program, Marine Biodiversity Hub, Commonwealth Scientific and Industrial Research Organisation (CSIRO).

Consideration

Through ongoing genetic research and tracking programs, the Commonwealth Scientific and Industrial Research Organisation (CSIRO) has identified two white shark populations in Australia:

- an eastern population (ranging along the east coast from Tasmania to central Queensland), consistent with a number of other species of sharks, finfish and invertebrate species in Australian waters; and
- a southern-western population ranging from western Victoria to northwest Western Australia, with possible links to South Africa.⁵

The CSIRO's research also identified (among other things) that white sharks are long-lived and slow growing species, that females do not reproduce in Australian waters until approximately five metres in length and about 16 years of age, and that the gestation period is 18 months, and that for these reasons white sharks are considered vulnerable and slow to recover from population loss.⁶

The white shark is listed as 'Vulnerable' at both the State and Commonwealth levels, and is protected under both the WA *Biodiversity Conservation Act 2016* and the EPBC Act.

In 2013 the Commonwealth released the Recovery Plan for the white shark, with the overarching objective to assist the recovery of the species in the wild throughout its range in Australian waters, with a view to:

- improving the population status, leading to future removal of the white shark from the threatened species list of the EPBC Act; and
- ensuring that anthropogenic activities do not hinder recovery in the near future, or impact on the conservation status of the species in the future.

The Recovery Plan summarises the primary threats to the white shark as mortality due to being caught accidentally (bycatch) or illegally (targeted) by commercial and recreational fishers, and shark control activities such as beach meshing or drum lining. Among other things, the Recovery Plan outlines a number of actions, including ongoing monitoring and tagging to assess population trends, understand behaviour, identify critical habitat, and quantify the impacts of human activities.

With reference to shark control programs, the Recovery Plan states:

Shark control (bather protection) activities take place at popular beaches in Queensland and New South Wales and at the time of printing are being considered in Western Australia. Shark-control programs are expensive in that the equipment deployed requires regular boat-based maintenance, and they also incur associated environmental costs. Catches are not confined to dangerous shark species, but include species that pose little threat to human safety (Cliff & Dudley, 2011). The trialling of non-lethal methods to deter sharks is included as an objective of this recovery plan and may provide a sustainable solution to the dual issues of white shark conservation and human safety.⁷

The development and introduction of the Recovery Plan for the white shark highlights the importance of the need to minimise actions that could affect the white shark population.

In relation to population statistics of the white shark, the following is noted:

- according to the Recovery Plan, determining trends in the overall Australian white shark population is difficult due to wide dispersal, low density and high mobility, and there is evidence of a decline in numbers over the last 60 years;

⁵ <https://www.csiro.au/en/Research/Environment/Oceans-and-coasts/Sharks/White-shark-research-findings>

⁶ <https://www.csiro.au/en/Research/Environment/Oceans-and-coasts/Sharks/White-shark-facts/White-shark-conservation>

⁷ Recovery Plan, page 35.

- according to a risk-based, weight of evidence assessment undertaken by the Department of Fisheries in 2014, the plausible estimate for the southern-western Australian white shark population appears to be stable with a high likelihood range being from 3,400-4,500;⁸ and
- according to the assessment undertaken by Bruce et al. (2018), the mean estimate of adult abundance for the southern-western Australian white shark population was 1,460 (uncertainty range 760 to 2,250) with adult survival rates in the 90 per cent and above range, however there were no juvenile estimates from which to construct total population estimates.

It is also noted that impacts on and estimates of the southern-western Australian white shark population were raised in submissions received in relation to the three-year proposal, and responded to by the proponent.⁹

The proponent noted the findings of the assessment undertaken by Bruce et al. (2018), and advised:

... concerns regarding a lack of precise estimates of white shark population sizes within Australia, and particularly for the southern-western population, are well recognised and were a critical factor in deciding to trial a non-lethal drumline method. In addition, the trial program will have strict protocols and a very high level of observer coverage aimed at minimising the impact on any white shark caught. This includes immediately releasing any shark that does not look well enough to relocate. ...

The Bruce et al. (2018) study is part of a broad suite of approaches to bring greater precision to population size estimates for this species and thus fill a key gap in the biological understanding of these animals. It is important to note that the genetic study that enabled the best estimates of white shark population was made possible from the sharing of tissue samples obtained from white sharks that were tagged and released as part of the WA Government's ongoing non-lethal shark tagging initiatives. The additional genetic tissue samples that will be collected during the proposed non-lethal SMART drumline scientific trial will continue to be shared with these collaborators with the specific aim of further refining population estimates of white sharks in Australia. In addition, because every tagged white shark will be fitted with an acoustic and satellite tag, the trial will provide data on the mortality of white sharks. This will also assist in refining population estimates for white sharks because the survival rates of juvenile sharks in the south western population is currently unknown.

In response to this element of the appeal, the EPA advised:

The work in Bruce et al. (2018) shows there are advances being made in the understanding and knowledge about south[ern-]western white shark population and the types of further information needed to significantly improve the understanding of white shark populations in Australia, particularly in relation to population trends. ...

The EPA ... considers that tagging sharks as part of this trial will further assist in providing data for population models.

Having regard to the uncertainties in the population size and the fact that the White Shark is listed as 'Vulnerable' under the State *Biodiversity Conservation Act 2016*, the proponent designed the trial to be non-lethal (i.e. sharks that are caught will be tagged, relocated and released).

This aspect of the trial differs to the [three]-year Shark Hazard Mitigation Drum Line Program (2014-2017) that was previously assessed by the EPA in 2014. For the previous proposal, the proponent proposed to euthanise caught sharks (white, tiger and bull sharks) over [three] metres in length. The proposal included a catch limit of up to 25 white sharks, 900 tiger sharks and 10 bull sharks.

In summary, the EPA is aware of the uncertainties in the latest estimates about white shark population, but critical to its decision that the proposal not be assessed, is the proponent's measures that will be implemented (as part of the proposal) to, as far as practically possible, minimise any harm to marine life including sharks.

⁸ PER (2014) Appendix 9 at: <http://www.epa.wa.gov.au/proposals/western-australian-shark-hazard-mitigation-drum-line-program-2014-2017>.

⁹ Proponent response to submissions on PER (2014), pages 21-22, at: <http://www.epa.wa.gov.au/proposals/western-australian-shark-hazard-mitigation-drum-line-program-2014-2017>

Conclusion

The appellant's view that there is scientific uncertainty around the southern-western Australian white shark population, and that the EPA recommended against implementation of the three-year proposal in 2014 on this basis, is acknowledged. In that case, the proposal involved baiting 24 hours per day, and destruction of target animals. In the case of the current proposal, baiting is proposed for daylight hours only with a rapid response to caught animals and their release. Thus the risk to the health of individual target and non-target animals as a result of the current proposal is expected to be substantially less compared to the three-year proposal.

Noting the above, as well as the limited scale and duration of the proposal, it is considered that the EPA's decision not to assess the proposal was justified. It is therefore recommended that this ground of the appeal be dismissed.

GROUND 2: DIRECT IMPACTS TO MARINE FAUNA

By this ground of appeal, the appellant submitted that while promoted as non-lethal, the proposed trial is not risk free:

Even if the upmost care is taken in catching, handling, relocation, and tagging, there will still be injuries and deaths to protected animals including the white shark as a result of the operation. And evidence in the short term that animals are OK is no guarantee that they won't succumb to stress or injuries ...

The appellant submitted that the EPA should assess the impacts of tagging, hooking, hook removal, handling, and relocation resulting in stress, broken jaws, stomach injuries, head wounds, infection, and drowning, in both target and non-target animals.

Other specific concerns raised by the appellant in respect to this ground of appeal included:

- the benefits of tagging have been overstated and the risks grossly understated, and while tagging plays an important role in science (e.g. population determination), the number of sharks tagged should not exceed that which is necessary for this purpose;
- with reference to the New South Wales (NSW) drum line trial, deaths of animals including white sharks have occurred and little formal data has been released which raises the possibility that the impacts are greater than predicted;
- with reference to the 2014 proposal, best practice could be compromised when operations are carried out by contractors with limited prior experience;
- noting that the 2014 drum line proposal caught mostly non-target animals, this proposal could result in injuries and death to a proportion of non-target animals;
- if there is data to suggest that tagging is harming sharks rather than protecting them, the public should be given the opportunity to provide more information that can be considered by the EPA via a full public review; and
- recent research on tagging identified problems including severe injuries and infections, as well as behavioural changes in sharks due to the signals that are emitted (such as the 'cat collar' effect alerting prey and the 'dinner bell' effect alerting predators).

Consideration

In response to this element of the appeal, the EPA advised:

... [The EPA] is satisfied that the proponent has considered the welfare of sharks during the design of the proposal and has identified the relevant measures to minimise the risk of injuries to shark and other marine life. ...

... The EPA is confident that [the proponent's] measures are feasible based on the DPIRD's operation of its existing shark tagging program where white sharks are caught and released alive.

The EPA understands DPIRD staff will join the contractor's vessel crew for the first month of gear deployment to provide training on tagging and handling of live white sharks as well as in relocation and data collection procedures.

As the proposal is a trial, the effectiveness of the proponent's measures with respect to the welfare of sharks will be evaluated to inform any further programs. ...

In addition, the EPA also notes that the proponent's measures to minimise the impacts on the health of sharks have been assessed and approved by the DPIRD's independent Animal Ethic[s] Committee from an ethical treatment and animal welfare perspective.

The DPIRD has also advised that weekly, monthly and [four]-monthly reviews will be undertaken during the trial. The DPIRD has advised that if there are any mortalities of white sharks or other listed species it may suspend operations while an investigation of the incidence is undertaken. The EPA supports this commitment and considers that this, combined with the proposed management measures, will reduce the risk or mortality of injuries to both target and non-target species.

In relation to the appellant's submission regarding risks of injury and mortality in captured target and non-target animals, the proponent advised that:

SMART drumlines provide an immediate alert via satellite if a bait is taken so that a response can be initiated immediately. Critically, the vessel undertaking the activity remains on standby for the duration of drumline deployment. The aim of using a real-time alert is to minimise the time that white sharks or bycatch spend hooked. The rapid response time, use of circle hooks and external rather than internal, tagging is expected to minimise the possibility of significant injury. This system was specifically developed to alleviate impacts (and community concerns) regarding unnecessary mortalities of target and non-target species in a shark hazard mitigation program.

Published figures from the NSW SMART drumline program demonstrate the very high survival rates for white sharks and other hooked animals. SMART drumlines are an alternative to unattended drumlines and shark nets, that are checked daily at best, and often result in the death of captured animals. As there has been no previously published research on the efficacy of this type of technology for adult white sharks, this program aims to meet this information gap.

Regarding the post-release survival of white sharks, the proponent advised:

A crucial component of the study is the ability to assess post-release survival of white sharks over a period of months. This will be assessed from data generated by pop-up satellite archival tags (PSATs) attached externally to each white shark and programmed to release if the shark dies (i.e. stops moving). If mortality were to occur following the tagging and relocation process, this information will be transmitted through satellite from the tag that has "popped" to the surface and this will be reported. ...

Section 2.3 of the proponent's referral document outlines the methodology by which the SMART drum lines are to be operated.¹⁰ In summary:

- when a bait is taken and puts pressure on the line, a triggering magnet is released causing the communications unit to transmit an alert to the operator;
- the operator must respond immediately to alerts and be at the triggered SMART drum line within 30 minutes of an alert being triggered and immediately tag, relocate and release the shark; and
- in the case of multiple alerts, the priority will be to provide as fast a response as possible to each alert and to release the sharks on site, without relocation, as soon as possible, starting with the SMART drum line closest to the operator's position.

Section 2.3.6 of the proponent's referral document sets out the procedure by which captured sharks are to be handled, including an assessment of the shark's behaviour, and specifically:

Large sharks are usually able to be approached by a boat after 5-15 minutes of being hooked. Once the contractor has retrieved the SMART drumline buoys, the contractor will secure the shark alongside the vessel.

¹⁰ Proponent's referral document, pages 4-11.

... a belly rope will be applied around the abdomen of the shark (behind one pectoral fin and in front of the other) and secured to the vessel while ensuring that the shark's head and gills remain underwater. A tail rope will then be looped around the shark's tail and secured to the vessel. Once secured biological measurements and tagging can take place.¹¹

Section 2.3.7 of the proponent's referral document sets out the procedure by which all white sharks and tiger sharks (*Galeocerdo cuvier*) of three metres or greater in length are to be relocated, specifically:

... Any shark being relocated will remain in the water at all times.

The technique used for the relocation of a shark will be contingent on a number of factors including weather, shark species, size, temperament and physical condition. In reasonably calm conditions it may be possible to relocate a shark using the two tethering ropes described above. At other times a sling, placed under the shark and secured to the side of the vessel, may be required to effectively secure and support the shark during relocation.¹²

Section 2.3.8 of the proponent's referral document sets out the procedure by which hook removal and release is to be undertaken, specifically:

... the hook is removed using long nose pliers or a de-hooking tool. The sling and/or tether ropes are then released and the shark will be held upright by the dorsal fin. This allows for improved water flow and oxygen uptake. The shark will be released when it moves off under its own power.

... the health of the shark will be monitored as best as possible and the post release condition of the shark recorded.¹³

In 2013 the CSIRO published protocols for the capture and tagging of juvenile white sharks (less than three metres in length) for research purposes.¹⁴ The protocols include the following:

- sharks are captured by hooking and tiring them 'by hand' on 12 mm rope using a single 12 to 14-0 hook attached to a short multi-strand steel trace. It is preferable to hook sharks on the left side of their jaw;
- sharks are gradually tired to the point whereby they can be safely handled, yet are still able to independently swim when released (15-30 minutes);
- when ready, sharks are restrained in a purpose built stretcher that is in the water beside (and secured to) the vessel, oxygen is delivered to the shark, then tagging and measuring is undertaken;
- all reasonable steps should be taken to remove the hook from the mouth of the shark using a suitable de-hooking tool; if the hook cannot be accessed or easily removed, the trace can be removed by undoing the connecting shackle using the de-shackling tool; if this is not possible, the trace should be cut with suitable wire cutters as close to the hook as possible; and
- after all procedures have been completed and the hook/trace removed, the front ends of the stretcher can be opened, the stretcher lowered slightly and the shark moved forward to a release position, allowing the shark to swim out of the stretcher.¹⁵

The proponent's capture and release procedures appear to be broadly consistent with the procedure set out by CSIRO for white sharks less than three metres in length. It is noted, however, that the SMART drum line trial proposes to use a 20/0 circle hook, which is larger than the 12 to 14-0 hook outlined in the CSIRO capture and tagging protocols. The proponent's referral document states that the size and design of the hook is consistent with those used in the NSW drum line trial.

¹¹ Proponent's referral document, page 9.

¹² Proponent's referral document, page 9.

¹³ Proponent's referral document, page 9.

¹⁴ Bruce, B. and Bradford, R., (2013) *Protocols for capturing and tagging juvenile white sharks in near-shore waters*. National Environmental Science Program, Marine Biodiversity Hub, Commonwealth Scientific and Industrial Research Organisation (CSIRO); pages

¹⁵ CSIRO capture and tagging protocols, pages 7-16 and 19.

In additional information supplied in support of this ground of appeal, the appellant provided an article on the impacts of incidental hooking on sharks.¹⁶ The study considered the incidence of attached fishing gear and gear-related injuries, the demography of sharks with retained hooks or fishing-related injuries, and the types of fishing gear involved. In respect of jaw injuries, the study found that retained hooks in the jaw did not always result in jaw injury, however such injuries were often progressive. The study found that ingested hooks are likely to affect lifespan and reproductive output. It is noted that the SMART drum line trial proposes to use 20/0 circle hooks, which are understood to be specifically designed to locate in the jaw hinge (thereby avoiding ingestion) for large-scale catch-and-release fishing.

Conclusion

Taking into account the information presented in respect to this ground of appeal, it is considered that the EPA adequately assessed direct impacts to marine fauna in considering whether or not to assess the proposal. In this context, and noting the limited scale and duration of the proposal, it is considered that the EPA's decision not to assess the proposal was justified. It is therefore recommended that this ground of the appeal be dismissed.

GROUND 3: BEHAVIOURAL CHANGES TO SHARKS

By this ground of appeal, the appellant submitted that:

... the benefits of tagging have been overstated and the risks grossly understated. Tagging procedures have recently been the focus of research ... [which] points to serious problems in the technology that include: severe injuries and infections, as well as behavioural changes in sharks due to the signals that are omitted. Regarding concerning behavioural changes, they speak of the "cat collar" effect in which potential prey are frightened away making it more challenging for sharks to predate, as well as the "dinner bell" effect which alerts larger predators to their presence making them more vulnerable to being prey.

... if there is data to suggest that tagging efforts are in fact harming sharks rather than protecting them, then the public should be given the opportunity to provide more information that can be considered by the EPA via a full public review.

The appellant also submitted that because baited drum lines may attract sharks, they may increase risks to ocean users. The appellant submitted that behavioural changes due to tagging that affect a shark's ability to feed suggests an increased risk to humans.

Consideration

In response to this ground of appeal, the EPA advised:

... that both white shark predators and prey species may hear the sound emitted by tags attached to individuals tagged during the trial. However, the EPA ... is not aware of any scientific studies that show either learned tracking behaviours in predators or avoidance behaviours in prey that would imply white sharks may face long-term welfare or behavioural changes.

The EPA also notes that the tagging methods proposed are well established protocols and used by the international scientific community. Acoustic tags attached to white sharks both within Australia and elsewhere in the world have been detected for long periods of time (e.g. years) and over extremely long distances. The EPA notes that this may imply that white sharks can continue to avoid predators and find sufficient prey. The EPA considers that there is insufficient evidence to demonstrate that the acoustic tags could potentially impact white sharks in the manner stated.

¹⁶ Bansemer, C.S. and Bennett, M.B. (2010) *Retained fishing gear and associated injuries in the east Australian grey nurse sharks (Carcharias taurus): implications for population recovery*. In: *Marine and Freshwater Research* (2010), 61, 97-103. CSIRO Publishing.

In relation to the research cited by the appellant, it is understood that this refers to a study into the effects of acoustic tags, the findings of which alluded to 'cat collar' and 'dinner bell' effects. It is noted that 'cat collar' and 'dinner bell' effects were also referred to in at least one submission to the Senate Environment and Communications References Committee inquiry into the efficacy and regulation of shark mitigation and deterrent measures in 2017.¹⁷ The appellant advised that due to some sensitivity about the status of the research, it was not possible to provide a copy of the results as part of the appeal.

The proponent noted that the research referenced by the appellant appears to have been erroneously generated as a media report in 2016, as the researcher concerned confirmed that there is indeed no such research and they had been misrepresented. As a result, the proponent is of the view that the reference to the 'cat collar' and 'dinner bell' effects are inaccurate and improbable. The proponent went on to state:

A recent study showed that external PSAT tag as proposed to be used in this study '... does not negatively impact juvenile sandbar shark (and by extension other elasmobranch species of equivalent or larger body sizes and employing a similar swimming mode)'. Based on this science, external tagging of larger bodied species such as the white shark in the proposed study will have very minimal impacts to each sharks' behavior [sic] and physiology.

A crucial component of the proposed SMART drum line trial study, in terms of animal welfare, is the ability to assess post release survival of white sharks. This will be assessed from data generated by pop-up satellite archival PSAT tags that will be attached externally to each white shark. If mortality were to occur following the tagging and relocation procedures, then this information will be transmitted through satellite from the tag that has 'popped' to the surface and this will be reported.

Conclusion

As for Ground 1, noting that the proponent's measures are broadly consistent with the Recovery Plan, it is also considered that the EPA's view that the proponent's measures will minimise harm to marine life, is justified. It is therefore recommended that this ground of the appeal be dismissed.

OTHER MATTERS

The appellant raised the matter of social values which is not directly related to environmental impacts or the EPA's decision not to assess the proposal. The appellant's concerns in respect to this matter are noted below, together with the EPA's and proponent's advice where provided.

Impacts to social values

The appellant submitted that the EPA should assess the impacts to social values:

- invasive shark hazard mitigation procedures are a threat to emerging social values related to protecting the environment and the animals within it;
- a number of online surveys, the State Government's own research in 2013,¹⁸ and a recent petition have indicated that the public do not want lethal or extreme measures to control a minimal risk, and persisting with harmful or lethal strategies is offensive as it affronts public values about preserving a delicate marine environment; and
- most people are not overly worried about sharks, and very few stop using the ocean due to sharks, and most are happy to accept personal responsibility.

¹⁷ Stephenson, P. (2017) *The Efficacy and Regulation of Shark Mitigation and Deterrent Measures*. Submission to the Senate Environment and Communications References Committee, February 2017.

¹⁸ Marketforce Metrix (2013) Community Perceptions Research. Report prepared for the Department of Fisheries WA, dated May 2013.

In relation to this matter, the proponent advised:

The issue of shark mitigation is one that generates significant public interest and a range of different views. The WA Government is committed to the implementation of mitigation strategies that are evidence based and backed by science. The purpose of conducting the trial is to determine the effectiveness of SMART drumlines as a non-lethal shark mitigation strategy that adds materially to risk reduction to ocean users while not adding to the conservation risks for white sharks or other animals. ...

In response to this matter, the EPA acknowledged that a large proportion of the public are not supportive of lethal measures to control white shark populations. The EPA advised that it can consider the environmental factor 'Social Surroundings' in environmental impact assessment where there is a clear link between a proposal's impact on the physical or biological surroundings and the subsequent impact on a person's aesthetic, cultural, economic or social surroundings. The EPA advised that while there is a potential impact to biological values from the proposed non-lethal trial, it is of the view that any related impacts to a person's social surroundings are likely to be minor.

CONCLUSION AND RECOMMENDATION

In reviewing the matters raised by the appellant in the context of the EPA's decision not to assess the proposal, and in particular the limited duration and extent of the proposal, it is considered that the EPA's conclusion that the environmental impacts are not so significant as to warrant formal assessment is supported by the available evidence and its decision not to assess the proposal was justified. It is therefore recommended that the appeal be dismissed.

During a meeting, the appellant expressed a concern that it is likely that following this trial the State Government will propose the use of SMART drum lines for an extended duration along an expanded extent of coastline, as has occurred in NSW. Given this concern relates to a possible future proposal, it is not considered in this report. Should such a proposal be developed, it will be subject to the referral provisions of the EP Act in the normal way.

Emma Gaunt
APPEALS CONVENOR

Investigating Officer:

Jean-Pierre Clement, Deputy Appeals Convenor
Emma Bramwell, Senior Environmental Officer