



# The Wilderness Society

## Submission to the Environment and Communications References Committee Inquiry into the impact of seismic testing on fisheries and the marine environment

10 December 2019

### Inquiry Terms of Reference

The Senate Committee established an Inquiry into the Impact of Seismic Testing on Fisheries and the Marine Environment on 16 September 2019.

*The Committee will consider and report on the impact of seismic testing on fisheries and the marine environment, with particular reference to:*

- a. the body of science and research into the use of seismic testing;*
- b. the regulation of seismic testing in both Commonwealth and State waters;*
- c. the approach taken to seismic testing internationally; and*
- d. any other related matters.*

### Executive Summary

1. Many protected species in the marine environment and the values of marine protected areas will be adversely affected by seismic activity.
2. The science and research into the impacts of seismic testing on the marine environment, and measures to mitigate its adverse effects, is evolving but there remain many knowledge gaps in Australia and internationally. In light of this uncertainty and the potential risk of harm to the environment, the

precautionary principle enshrined in the *Environment Protection and Biodiversity and Conservation Act 1999 (Cth)* places the onus upon proponents of the seismic activity to prove that any harm from the activity is mitigated to an acceptable level.

3. Assessment of the environmental impacts of seismic activity must be based upon the evolving scientific evidence. The Regulation of offshore oil and gas exploration activity in Australia under the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Cth)* is not prescriptive. The proponent of any seismic activity must demonstrate that the potential risks and impacts or any change to the environment as a result of the activity are mitigated to as low as reasonably practical and that any residual risk is 'acceptable'. Accordingly, current scientific knowledge and changing community standards as to what may be an 'acceptable' risk to the environment must be taken into account by proponents in preparing an environment plan for a seismic activity.
4. Under the present Regulatory regime, the government must also ensure that the decision maker in respect of MSS activity applies the precautionary principle and gathers all possible knowledge and evidence on ecological, climate, social, economic and cultural impacts to properly assess the potential risks and impacts and any change to the environment.
5. TWS considers that implementation of the recommendations made below are important to prevent significant and unacceptable adverse impacts on marine matters of national environmental significance, and ensure that the precautionary principle and principles of ecologically sustainable development are applied to this sector.

## Recommendations

6. Establish applicable baseline data within all offshore petroleum basins/precincts, prioritising regions with critical marine species habitats, aggregation sites and sensitive receptors for urgent assessments.
7. Conduct independent research into the long-term and cumulative impacts of the sub lethal effects of seismic noise on marine fauna.
8. Exclude MSS activities from Commonwealth Marine Reserves, that provide habitat for whales, other cetaceans and protected marine species.
9. Ensure that the regulator, in respect of an MSS activity, gathers all possible knowledge and evidence on ecological, climate, social, economic and cultural impacts to properly assess the potential risks and impacts and any change to the environment.

10. Require the use of precaution in the management of MSS impacts to the marine environment and the regulatory process for their assessment.
11. Require mandatory monitoring and transparent publication of the impacts of any MSS, including any changes to the environment as an immediate result of the activity and 6 months following the activity.
12. Clarify with the regulator that approval conditions for MSS activities, or any other offshore petroleum activities, should not be used to facilitate the approval of a proposed MSS Environment Plan that does not otherwise meet the regulatory requirements for approval, or in order to address issues raised by consulted parties where the proponent has failed to appropriately do so.

## Introduction

*One of the other challenges with seismic activities is that science is constantly evolving along with the expectations of the community...*<sup>1</sup>

13. The potential risks and impacts of marine seismic survey (**MSS**) on marine biodiversity, in particular the noise related impacts on marine mammals, is well documented. Regulation designed to assess and mitigate the impact of sound generated during MSS on marine species requires the latest scientific knowledge and industry guidance in Australia and internationally to be considered in any decision-making process.
14. There are significant knowledge gaps in scientific understanding of the impacts of noise from MSS on protected marine species, their food source and their habitat. Ongoing research into the population and distribution, migratory, breeding and foraging patterns and movements of marine mammals, sharks and large pelagic fish in regions such as the Great Australian Bight (**GAB**) is essential to address these knowledge gaps. This research and the baseline data obtained is relevant to the assessment of the potential risks and impacts of noise associated with oil and gas exploration and the effectiveness of measures to mitigate the impacts.<sup>2</sup>

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<sup>1</sup> NOPSEMA 2019 *the Regulator* Issue 1: 2019 at p.7

<sup>2</sup> CSIRO-MISA 2013 *Research Program to Support BP Oil/Gas Exploration in the Great Australian Bight - Proposal*, p.12 <https://www.environment.gov.au › files › c2013-0005-background-info>

## Background

15. In 2014, the Federal Environment Minister, delegated assessment of matters of national environmental significance under the *Environment Protection and Biodiversity and Conservation Act 1999 (EPBC)* for petroleum and greenhouse gas activities to the petroleum industry operational and safety regulator, the National Offshore Petroleum Safety and Environmental Management Authority (**NOPSEMA**). Accordingly, an environment plan (**EP**) for any MSS in relation to offshore oil and gas exploration has since 2014 been assessed by NOPSEMA under the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (Cth) (OPGGs Regulations)*.
16. The *OPGGs Regulations* require the proponent to mitigate the risks and impacts of the activity under assessment to as low as reasonably practicable (**ALARP**) and to an acceptable level. Assessment of the risks and impacts of the activity requires the proponent and NOPSEMA, to take account of best practice in internationally recognised industry guidance<sup>3</sup> and the most up to date scientific knowledge<sup>4</sup>. The *OPGGs Regulations* are not prescriptive and place the onus on the proponent to develop an EP and management and mitigation measures for the activity in accordance with current scientific knowledge and best practice.
17. The absence of conclusive scientific studies and baseline data in relation to impacts of MSS on marine species protected under the *EPBC*, and also their food sources, creates considerable uncertainty in the identification and appropriate assessment of environmental impacts of MSS. Accordingly, the principles of ESD require NOPSEMA, in respect of the assessment and approval of any MSS, to act with precaution to ensure that there is no risk of irreversible adverse impacts or changes to the environment as a result of the activity.
18. Implementing measures to mitigate the risks and impacts of MSS on threatened and migratory species requires a detailed understanding of their population ecology, structure and behaviour and the development of risk assessment, monitoring and responsive management programs. Whether any residual impact of the activity, after adopting of all mitigation measures, is 'acceptable' is to be assessed by reference to 'environment and stakeholder expectations', including information obtained through the required consultation with 'relevant persons'<sup>5</sup>. This demonstrates the importance of MSS proponents (and indeed proponents of other offshore petroleum activities) undertaking effective and thorough consultation with persons and organisations from a broad spectrum of functions, interests and activities that may be impacted by the proposed activity.

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<sup>3</sup> NOPSEMA 2019 *Guidance note – Environment Plan Content Requirements* (Rev 4) at p.[17]

<sup>4</sup> NOPSEMA 2019 *the Regulator* Issue 1: 2019 at p.5

<sup>5</sup> Ibid fn 1 at p.[17].

## Science and research into the use of seismic testing

*A more comprehensive paradigm for assessing impacts of anthropogenic noise (or other activities) on marine mammals needs to include explicit consideration of all potential pathways of harm, including adverse impacts resulting from both close-range exposure and displacement away from the sound source.*<sup>6</sup>

19. It is acknowledged that the GAB is an area of high marine conservation significance -

*It has the greatest apex predator (marine mammals, seabirds, sharks and large pelagic fish) densities of any shelf system in Australia, including Australia's largest feeding area for pygmy blue whales, calving aggregation for southern right whales, breeding and foraging grounds for Australian sea lion and main aggregation area of great white sharks.*<sup>7</sup>

20. The CSIRO-MISA Research Program to Support BP Oil/Gas Exploration in the Great Australian Bight (**GABRP**) established in 2013<sup>8</sup>, proposed research programs to address knowledge gaps in relation to environmental, economic and social values of the GAB ecosystem<sup>9</sup>, including the absence of data on:

- *regional, inter-annual and seasonal patterns of microbial, planktonic and micro-nektonic community structure and dynamics*
- *baseline information on levels of biodiversity and endemism in pelagic communities that will be required to develop an ecological monitoring program; and*
- *information from which to predict the likely impacts of noise or spillages from oil and gas exploration*

21. Objectives of the GABRP Theme 4 *Ecology of Apex Predators* included:

- *to understand what key oceanographic processes underpin prey production and hence the distribution, population structure, foraging locations, movements and migratory patterns of apex predators in the GAB;*
- *to determine cetacean distribution and estimate relative abundance, island-based mark-recapture and burrow/nest surveys of key seal and*

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<sup>6</sup> Forney K.A. et al (2017) *Nowhere to go: noise impact assessments for marine mammal populations with high site fidelity*, Endang Species Res 32: 391–413, 2017

<sup>7</sup> Ibid fn.[2]

<sup>8</sup> Ibid fn[2]

<sup>9</sup> Rogers, P.J et al 2013. *Physical processes, biodiversity and ecology of the Great Australian Bight region: a literature review*. CSIRO, Australia., 197 pp.

- *seabird colonies, and pelagic surveys of sharks and large fish to characterise their relative abundance and distribution; and*
  - *integrate location time-series data from electronic tags and integrate with environmental data to develop movement and habitat models, identify key-hot spots and Areas of Ecological Significance (AES); and*
  - *assess the potential impacts of noise associated with oil and gas exploration on wild and farmed juvenile southern bluefin tuna.*<sup>10</sup>
22. Other themes in the GABRP proposed to expand the scientific knowledge of the ecosystems of the GAB, *including studies of microbial, planktonic and micro-nektonic communities which will in turn assist studies of distribution, abundance, foraging patterns and migratory patterns of apex predator species.*<sup>11</sup> The GABRP did not include research to specifically assess the noise impacts of MSS on protected species such as whales, fur seals, Australian sea lions, dolphins and other conservation dependent fish species.
23. The GABPR provided the most comprehensive *synthesis to date of the status, distribution and abundances of iconic and apex predator species in the GAB.*<sup>12</sup> Final reports from the GABRP confirm that there remains a lack of reliable information to assess the risks and impacts of MSS on marine mammals –
- ...the many activities required for a successful experimental design, execution, and analysis require expertise from a range of disciplines including animal behaviour, experimental design and statistical analysis, hearing and auditory perception, sound generation and propagation in the ocean, ambient sound generated in the sea, and signal detection. Without due consideration of the requirements for adequately assessing the behavioural responses to sound generated by activities such as oil and gas exploration, assessing the impacts of these activities on marine animals will continue to be difficult and, as a result,*<sup>13</sup> *largely either a qualitative or modelling exercise with inherent uncertainties.*
24. Whales are extremely sensitive to the impacts of noise from seismic testing and the noise can force whales away from their habitat.<sup>14</sup> There are some signs of animals that have redistributed their calving habitat. In relation to Southern Right Whales –

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<sup>10</sup> Ibid fn 2 at p[8]

<sup>11</sup> Ibid fn 2 at p[2]

<sup>12</sup> Evans K, Rogers P and Goldsworthy S (2017). *Theme 4: Ecology of iconic species and apex predators*. Theme Report. Great Australian Bight Research Program, Great Australian Bight Research Report Series Number 37, 19pp.

<sup>13</sup> Evans, K., at el (2017). *Southern bluefin tuna: spatial dynamics and potential impacts of noise associated with oil and gas exploration. Final Report GABRP Project 4.3*. Great Australian Bight Research Program, GABRP Research Report Series Number 18, 96pp.

<sup>14</sup> IFAW 2016 *Submission to the Senate Enquiry into Oil and gas drilling in the Great Australian Bight*

*The science shows that it is likely that the animals would continue to return to the same areas. In terms of if they changed direction, it is a really big question because, at the moment, we really know very little about their offshore distribution and movements and migratory pathways.*<sup>15</sup>

25. In light of remaining knowledge gaps, it was recommended to the Senate Committee *Inquiry into oil and gas drilling in the Great Australian Bight* that -

*...further research is needed to establish a baseline understanding of whale behaviour in the area so that the effects of vessel traffic and acoustic noise can be identified and monitored;*

and further,

*It is really a matter of gathering the right amount of data, **adopting the precautionary principle**, finding out the information we need and seeing that those mitigation tools are in place.*<sup>16</sup>

26. There have been no studies that specifically evaluate the correlation between the abundance of whale populations in the GAB and the location, time period and noise levels of MSS activity. It is considered likely that whale distribution is related to prey availability and there is evidence of plankton mortality resulting from seismic surveys.<sup>17</sup> Interpreting the function of upwelling systems and the correlating effect on prey ecology is inherently complex, however –

*Correlation between SST [sea surface temperature] (or any other variable) and whale presence does not necessarily imply a causal relationship, and given the function of the Bonney Upwelling as a foraging area, variability in blue whale responses to SST is likely a result of the complex and dynamic interactions of SST with prey availability... A key determinant of blue whale distribution in this upwelling region is likely to be the distribution of their euphausiid prey *Nyctiphanes australis*, the ecology of which is little known in this upwelling system.*<sup>18</sup>

27. There have been no seismic surveys in the GAB since 2013/14. In 2019, five years later, aerial surveys in February 2019 reported that blue whales were sighted in higher numbers (along with sperm, pilot and killer whales) in the GAB –

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<sup>15</sup> Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 5.

<sup>16</sup> Ibid fn 14

<sup>17</sup> Mc Cauley et al 2017 *Widely used marine seismic survey air gun operations negatively impact zooplankton* Nature and Ecology & Evolution 2017

<sup>18</sup> Gill et al. (2011) *Blue whale distribution and habitat selection, Australia*, Mar Ecol Prog Ser 421: 243–263

*'it was an exceptional year out there in the Bight – numbers like this are unique'- believed to relate to an earlier than usual upwelling and the whales spent at least two months along the continental shelf<sup>19</sup>.*

28. In respect of the environment plan (**EP**) of PGS Australia Pty Ltd (**PGS**) for the Duntroon MSS activity in the GAB<sup>20</sup>, there is a proposal for CSIRO to –

*"...evaluate the effect of seismic operations on organisms immediately around the survey. This is based on an earlier PGS CSIRO collaboration in 2014/15 which provided bioacoustics data on schools and scattering data during active and inactive seismic operations. This methodology has the potential to provide information on nekton (20cm- 100cm) and micro-nekton communities (small fish, crustaceans 2-20 cm) relative to the environment and seismic operations."*

29. The Wilderness Society South Australia (**TWS SA**) requested PGS to make available the results of the data collected by PGS/CSIRO from the earlier 2014/15 MSS and the evaluation of the impact of the activity. PGS responded by stating that completion of the above research and evaluation was dependent on funding by CSIRO. The lack of monitoring, reporting and transparency in relation to scientific information acquired before, during and after MSS activity severely limits the assessment and evaluation of the risks and impacts of the activity on the marine environment. Importantly, it also seriously limits any robust evaluation of the effectiveness of measures adopted to ostensibly mitigate the impact of noise on protected marine species and ecosystems.

30. In the consultation report of the EP for the Duntroon MSS, PGS stated –

*PGS would like to confirm that the offshore oil and gas industry is concerned with the disparity of plankton mortality results between McCauley et al. (2017) and numerous prior studies which have directly assessed sound impacts on plankton to understand this disparity.*

31. A stakeholder raised a further issue as to *why has industry not already commissioned such research if they are concerned about adverse effects* [on zooplankton]. The response of PGS was –

*The Australian Institute of Marine Science (AIMS) has secured approximately \$12M of funding from Quadrant Energy through a Good Standing Agreement to undertake research into the impacts of seismic testing. One of four themes to be studied includes establishing the effects of seismic testing on plankton. The program commenced on 1 July 2017.*

32. An AIMS research project in relation to the impacts of seismic testing was completed in September 2018 under the auspices of the North West Shoals to

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<sup>19</sup> Pete Gill, CEO Blue Whale Study in the ABC 14 Feb 2019 *Record number of blue whales in Great Australian Bight this summer only seen thanks to tuna spotters*

<sup>20</sup> Approved by NOPSEMA in January 2019



Shore research program. The presentation in relation to this research program at the symposium in February 2019, provided the following summary of the environmental impacts of seismic activity:

- *Anthropogenic sound impacts species from zooplankton to whales, impact varies with the sound source and distance from the source.*
- *Significant gaps in knowledge of auditory response for many impacted species.*
- *Assessing the scale of impact on the population and the ecosystem is challenging requiring expensive and detailed studies.*
- *Assessing potential impacts requires a multiple-stressor risk framework for the species, population and ecosystem.*
- ***Need appropriate governance and management arrangement that has balance of burden of proof and precaution (emphasis added).***<sup>21</sup>

33. It is notable that in this most recent study, the authors confirm that there remains a significant gap in scientific knowledge in respect of the impacts of noise from MSS on marine species. For this reason, the authors also advocate the need for proponents to demonstrate that marine species are not at risk of harm from the activity and that precaution is required in the decision-making process for the activity.
34. Further, in 2019, AIMS conducted the *first real-world seismic experiment to determine the effects of marine noise on fish and pearl oysters.*<sup>22</sup> The results of this study will be important to inform any assessment of the risks and impacts of seismic testing on oysters and demersal fish. This recent research project illustrates that the scientific knowledge relating to the impacts of scientific surveys is continuing to evolve.
35. Strategies to mitigate the adverse impacts of MSS generally include visual monitoring and associated shut down procedures, aimed to reduce the level of exposure that may cause injury and allow marine species to move away. *The effectiveness of these mitigation techniques is poorly known, and repeated ramp-up and shutdown may actually increase the cumulative energy output into the environment.*<sup>23</sup> Recent research indicates that sound level is not necessarily the main driver of behavioural response in marine species.
36. Recent case studies on noise impact assessments for marine mammals indicate that these measures are based *on the assumption that animals will be able to move away and in doing so will not be harmed* and fail to consider the biological cost of displacement in response to noise pollution. In fact, displacement may result in significant harm and the costs to marine

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<sup>21</sup> Kloser R. and Evans K. 2018 *Potential anthropogenic underwater noise impacts on zooplankton to whales a general overview.*

<sup>22</sup> IMAS 2019 Media Release

[https://www.aims.gov.au/docs/media/latest-releases/-/asset\\_publisher/8Kfw/content/world-first-seismic-sound-experiment-conducted-off-nw-australia](https://www.aims.gov.au/docs/media/latest-releases/-/asset_publisher/8Kfw/content/world-first-seismic-sound-experiment-conducted-off-nw-australia)

<sup>23</sup> Ibid fn 6

populations of leaving their habitat may be severe.<sup>24</sup> A report on recent studies notes -

*A more comprehensive paradigm for assessing impacts of anthropogenic noise (or other activities) on marine mammals needs to include explicit consideration of all potential pathways of harm, including adverse impacts resulting from both close-range exposure and displacement away from the sound source. Both types of responses can lead to reduced foraging success, increased stress, disruption of important social and reproductive functions, and decreased survival or reproductive success through a variety of pathways.*<sup>25</sup>

37. On the basis of recent scientific research it is considered that even if the environment plan assessment and management process is of high standard, mitigation measures for MSS activity can only really be put into place to reduce hearing damage. The only way to mitigate sub lethal impacts (stress, behavioural, masking, displacement etc.) is by reducing the amount of sound introduced by the activity. The current research indicates that there will be an adverse impact and potential irreversible harm to species susceptible to the impacts of noise, including whales and protected marine species as a result of exposure to MSS activity in their marine environment. Mitigation measures to reduce the extent of exposure to noise from the activity have limitations and may not be effective and further, will not adequately address the harm of displacement from their habitat.

## **The regulation of seismic testing in both Commonwealth and state waters**

38. In Australia, *EPBC Policy Statement 2.1 Interaction between offshore seismic exploration and whales: Industry guidelines (Policy Guidelines)*, specifies measures to be adopted in relation to management procedures for seismic surveys. The Policy Guidelines were developed in 2008, based upon what is now likely to be significantly outdated scientific research and recognise -

*"The effects of human made sound in the marine environment is a concern for marine life, particularly whales and dolphins that may be sensitive to certain sound levels, potentially resulting in physical and/or behavioural impacts."*<sup>26</sup>

39. The Policy Guidelines adopt the prevailing management approach of visual monitoring and guidelines for suspension of activities and contain practical measures that minimise the likelihood of physical impacts to whales from seismic surveys. Recent scientific evidence indicates that a more

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<sup>24</sup> Ibid fn 6

<sup>25</sup> Ibid fn6 at p[402-403]

<sup>26</sup> Australian Government, Department of the Environment, *EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales* (September 2008), page 2

comprehensive basis for assessment of the impacts of noise, including displacement from the sound source should be considered.<sup>27</sup>

40. A Marine Bioregional Plan (under section 176 of the *EPBC*) has been prepared for the South-west Marine Region, encompassing the GAB Commonwealth Marine Reserve (**GAB CMR**) to identify priorities and strategies to address pressures on the marine environment and conservation values of the region. Blue whales are identified as one of the priority conservation values of this region. The National Conservation Values Atlas designates biologically important areas (**BIA**) for regionally significant marine species in the GAB CMR and provides data to assist decision-making under the EPBC.
41. In relation to biologically important habitats, the Policy Statement requires *explicit justification for why the proposed survey should take place* and further that *it will be necessary to implement more extensive measures, such as greater precaution zones and additional marine mammal observer coverage*. In regard to the additional measures, it is recommended that the proponent discuss these with the Department. In respect of MSS activities approved by NOPSEMA there is little evidence that either of these requirements has been strictly adhered to.
42. In 2015, an updated recovery plan for the blue whale, an endangered species under the *EPBC (Conservation Management Plan for the Blue Whale 2015-2025 (Blue Whale CMP))* was implemented. The Blue Whale CMP confirms that there is limited knowledge about the distribution and abundance of blue whales and *little is currently known about the location and characteristics of [their] habitats*. Further, -  
  
*While the seismic guidelines advise that seismic surveys should be undertaken outside of biologically important areas at biologically important times, it is not known at what distance from a seismic source, behavioural impacts may occur or the extent of any behavioural impact (p.33).*
43. Section 268 of the *EPBC* provides that *a Commonwealth agency must not take any action that contravenes a recovery plan or a threat abatement plan*. The Minister (and any delegated decision maker) must also take account of the provisions relating to cetaceans in the *South West Marine Bioregional Plan* in the assessment of any MSS activity.
44. In 2013-14 NOPSEMA completed assessments of four EPs for seismic surveys in the GAB and all of the EPs were accepted without question<sup>28</sup>. The uncertainty of the impact of the MSS activity on foraging blue whales that may be in the proximity of the survey and the threat of disturbance to the

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<sup>27</sup> Ibid fn.6

<sup>28</sup> Economics Legislation Committee: Answers To Questions On Notice Industry and Science Portfolio Additional Estimates 2014-15 26 February 2015, Scientific merit and objectivity of NOPSEMA's assessments

populations habitat, was not considered on a precautionary basis, nor does it appear that more extensive measures were required to manage the impact of the MSS activity in accordance with the Policy Statement.

45. The EPs also did not consider the impact of the noise generated by the MSS activity on Australian sea lions in the GAB, a species listed as vulnerable under the *EPBC*, notwithstanding that noise levels from the surveys very likely have a significant impact on the Australian sea lion foraging habitats within the BIA.<sup>29</sup> None of the EPs provided for monitoring of the sea lion activity and any correlation to the sound intensity within their habitat<sup>30</sup>. This suggests that NOPSEMA failed to take account of the IUCN management principles and the South West Marine Bioregional Plan in the assessment and approval of the EPs for the seismic surveys<sup>31</sup>.
46. Whales and cetaceans that use sound to communicate, navigate and feed are vulnerable to noise and respond by seeking to avoid noisy areas. Notably, courts in the United States have recognized that whales may be harmed by noise from shipping and seismic air guns.<sup>32</sup> A recent study has also demonstrated that blue whales occur in 44 per cent of the areas of the GAB that have undergone seismic testing or where testing is planned and that whales are present during the months when testing occurs.<sup>33</sup>
47. The Report of the Senate Committee *Inquiry into oil and gas drilling in the Great Australian Bight* 2016 further considered the evidence into the adverse effects of seismic testing on cetaceans (Report at [4.36] to [4.53]). In relation to available scientific evidence and baseline data, *Ms Charlton highlighted that further research is needed to establish a baseline understanding of whale behaviour in the area so that the effects of vessel traffic and acoustic noise can be identified and monitored.*<sup>34</sup>

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<sup>29</sup> Prideaux, M. & Prideaux, G., (2015) *Australian sea lions (Neophoca cinerea): the need for a revision of offshore oil and gas exploration assessment*, Wild Migration Technical Report Series, Australia at p [7-8]

<sup>30</sup> Ibid fn[28]

<sup>31</sup> Prideaux, M. & Prideaux, G., (2015) Australian sea lions (*Neophoca cinerea*) -The South-west Marine Bioregional Plan (SWMBP) directs that “actions with a real chance or possibility of increasing the ambient noise levels within female [Australian sea lion] foraging areas to a level that might result in site avoidance or other physiological or behavioural responses” have a high risk of a significant impact on this species. All attempts should be made to avoid biologically important areas, particularly waters surrounding breeding colonies and foraging areas.

<sup>32</sup> See, for example, *National Parks & Conservation Association v. Babbitt*, 241 F.3d 722 (9th Cir. 2001); *Center for Biological Diversity v. National Science Foundation* (N.D. Cal. Oct. 30, 2002), cited in Earthjustice submission to Senate Inquiry into *Oil and gas drilling in the Great Australian Bight*

<sup>33</sup> Greenpeace 2016 *Submission to the Senate Enquiry into Oil and gas drilling in the Great Australian Bight*

<sup>34</sup> Ms Claire Charlton, Curtin University Great Australian Bight Whale Project, *Committee Hansard*, 16 November 2016, p. 5.

48. In 2014, NOPSEMA conducted inspections of seven MSS activities during and following completion of the survey and reported -

*...a relatively common finding was the failure to provide responses to titleholders during and after planning stage consultations; as well as in some cases no implementation of ongoing consultation plans.*<sup>35</sup>

49. NOPSEMA also recommended that proponents engage with stakeholders more transparently and *provide meaningful responses to stakeholders who made objections or claims about the activity and allowing sufficient time for consideration and follow up.* Notwithstanding this finding, there is no information suggesting that the EPs for any of the MSS activities were rejected by NOPSEMA by reason of inadequate consultation and all of the EPs were approved.<sup>36</sup> No commitment was required by NOPSEMA of any of the proponents or subsequent proponents of MSS activity in the GAB to monitor and conduct a review of the cumulative impacts of the survey activity or to provide transparent reporting of information and data in relation to the impacts of the activity on the environment.

50. NOPSEMA recognise that seismic surveys will often be undertaken in frontier areas and the assessment is complex -

*"One of the other challenges with seismic activities is that science is constantly evolving along with the expectations of the community. In the recent case regarding the Great Australian Bight, we sought external expert advice from organisations such as the Australian Antarctic Division. Input from relevant external expertise is taken into account in NOPSEMA's assessment decisions as well as other compliance activities. In the case of the seismic survey decision in the Great Australian Bight, to ensure the most contemporary science was taken into account, we considered input from scientists and experts regarding whales in that particular region and best practice mitigation measures to supplement existing in-house knowledge."*<sup>37</sup>

51. In 2018, NOPSEMA developed the *Acoustic Impact Evaluation and Management Information Paper 1765 (Information Paper)* in response to the 'common deficiencies' identified in EPs relating to assessment of noise from MSS activities<sup>38</sup>. The Information Paper provides advice to title holders to assist with preparing EPs for MSS activities and incorporates by reference the technical advice provided by experts in the New Zealand Department of

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<sup>35</sup> NOPSEMA 2015 *The Regulator* Ed 1, p.[7]

<sup>36</sup> Ibid fn 26.

<sup>37</sup> NOPSEMA 2019 *the Regulator Issue 1:2019* David Christensen, Manager of the environment division's Seismic and Production Operations Team,

<sup>38</sup> NOPSEMA 2018 *The Regulator Issue 3 2018*

Conservation on sound propagation and cumulative exposure (**DOC 2016**).<sup>39</sup>  
The standard in DOC 2016 is effectively a requirement for assessment of impacts of noise from MSS activity. The Information Paper is due to be reviewed in December 2019.

52. The conditional approval by NOPSEMA on 14 January 2019 of the EP for the Duntroon MSS illustrates the failure to apply the precautionary principle in the assessment and approval process in the face of uncertainty as to the adverse impact of the activity on the marine environment. Importantly, the survey period overlapped the southern right whale migration in the BIA and uncertainty as to the behavioural impacts of displacement and the application of the precautionary principle weighed against the granting of the approval.
53. In the approval<sup>40</sup>, NOPSEMA noted –  
  
*The conditions were applied to address scientific uncertainty, and ensure sufficient protection for the environment, associated with timing of upwelling events and presence, abundance and movements of EPBC Act listed species.*
54. Assessment of the population wide threat to whales in the GAB was based upon practical measures to minimise physical impacts and relied upon visual observation, shutdowns and cetaceans moving away from the survey area. The activity overlapped in part the pygmy blue whale foraging season and potential upwelling events in November which coincides with the abundant presence of pygmy blue whales in the GAB. Further, the timing of the Duntroon MSS had a potential impact on southern right whales (SRWs) in and migrating away from the calving/aggregation BIAs in the GAB
55. The Policy Guidelines do not include specific measures to address the behavioural impacts of seismic activity. In the approval of the Duntroon MSS, NOPSEMA imposed conditions, among others, considered to address the uncertain risks and impacts of the activity specifically acknowledged by NOPSEMA. The conditions included that the activity be carried out in a manner that ‘ensured no injury’ to pygmy blue whales, SRWs and Australian sea lions. It was unclear on what basis NOPSEMA had assessed or determined that the conditions imposed would be effective to ‘ensure no injury’ or how the conditions would or could feasibly be enforced by NOPSEMA.
56. In respect of the blue pygmy whales, NOPSEMA imposed a condition that there be ‘no displacement from foraging areas’ and imposed measures to identify indicators of an upwelling event and the subsequent conduct of aerial surveys to locate any pygmy blue whales in the activity area. The effectiveness of this condition, which depends on aerial survey to identify whales, is limited by the extreme weather conditions in the GAB. No

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<sup>39</sup> DOC (Ed). 2016. *Report of the Sound Propagation and Cumulative Exposure Models Technical Working Group. Marine Species and Threats, Department of Conservation, Wellington, New Zealand.* P.59

<sup>40</sup> NOPSEMA 2019 Decision Notification Duntroon MSS p.[2]

conditions were imposed by NOPSEMA in respect of the collection of data and requiring the monitoring, reporting and assessment of the effectiveness of the conditions during and following the survey activity. In granting the approval it must also be assumed that NOPSEMA has the resources to enforce the conditions.

57. NOPSEMA acknowledged that the Duntroon MSS also had a potential adverse impact on SRWs by disturbing the calving and breeding in the BIAs and if the whales migrating away from the calving BIAs came into close proximity to the source of the noise. The conditions imposed by NOPSEMA to '*ensure no injury*' and no biologically significant disturbance depended upon visual observation to detect any SRWs within the operational area and shut downs if whales were observed. The NOPSEMA Information Paper, references the commonly implemented controls that rely on detection of cetaceans and shut downs as outlined in DOC 2016. It is however notable that DOC 2016 was not referenced in the Duntroon MSS EP approved by NOPSEMA. The extreme weather conditions of the GAB significantly limit visual observation and will impact upon the probability of detecting cetaceans, which is often much less than 100%<sup>41</sup>.
58. The Duntroon MSS was approved notwithstanding that NOPSEMA acknowledged the activity may lead to displacement of the SRW population. The conditions imposed were intended to ensure no '*biologically significant behavioural disturbance*'. The conditions required measures to ensure sound levels in the coastal calving BIAs are below behavioural disturbance thresholds. In this regard, NOPSEMA required data from sound loggers on the boundary of the calving BIA to be collected during the first period of the Duntroon MSS to '*inform the need for adaptive management*' in the following period of the survey. It is self evident that this condition would not provide for *adaptive management* to mitigate this impact of the Duntroon MSS during the first period of the survey.
59. Assessment of the risk of sound exposure of SRWs in the GAB was undertaken by JASCO Applied Sciences and the EP for the Duntroon MSS relied upon their report, *Animal Movement Modelling for Assessing marine Fauna Sound Exposures* (19 Sept 2018) (**JASCO Report**). The Jasco Report noted the transient migration of unaccompanied whales between the breeding grounds and deeper waters during the calving period and acknowledged the uncertainty in relation to SRW movements '*as scientific information on their behavior in the calving areas and offshore areas is scarce*' (p.2). The JASCO Report also confirmed that there was no consensus in the scientific community regarding '*the appropriate metric or sound levels useful for assessing behavioural reactions*'. The lack of information on whether the migration of the SRWs would take them closer to the area of the seismic activity further limited the reliability of the modelling results in the JASCO

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<sup>41</sup> Heide-Jørgensen et al. 2005, Barlow & Gisiner 2006, Hammond et al. 2013, Barlow 2015), quoted in Forney et al (2017), ibid fn [2]

Report (p.13). This 'scientific uncertainty' and the application of the precautionary principle in the assessment of the EP are not adequately addressed by the conditions imposed by NOPSEMA.

60. No information was provided by NOPSEMA in relation to how the conditions for approval of the Duntroon MSS would be enforced. In the recent Baleen 2D MSS, NOPSEMA had two inspectors on board for the duration of the survey. The complexity and length of the Duntroon MSS activity over two three month survey periods and a total of 91 survey days, would require a significant commitment of resources by NOPSEMA to have inspectors on board for the duration of the survey.
61. The Director of National Parks is a relevant person and must be consulted by a titleholder during preparation of EPs for activities within Commonwealth marine parks or that pose risks to a marine park and its values. Notwithstanding the role and expertise of the Director of National Parks, it appears that NOPSEMA has not consulted the Director of National Parks, in relation to the assessment of offshore petroleum proposals, including MSS activities.<sup>42</sup> There appears to be limited communication between NOPSEMA and the Director of National Parks /Department of Environment and Energy. Accordingly, scientific information obtained by NOPSEMA during the assessment process appears not to have been utilized to update and maintain the currency of guidance documents relating to the impacts of seismic activity on protected species, such as the Policy Guidelines and the Blue Whale CMS.

## The approach taken to seismic testing internationally

62. The framework of the *Convention on Migratory Species Noise EIA Guidelines for Seismic Surveys (Air Gun and Alternative Technologies)*<sup>43</sup>, including the modules E and G on species and impact from the *CMS Noise EIA Guidelines Technical Support Information (CMS Guidelines)* provide the current international standard in relation to the impacts of seismic testing and the relevant management measures and technical developments. The *CMS Guidelines* have been adopted in Australia and provide the context for assessment of impacts of noise from seismic activity. An important requirement of the CMS Guidelines is for the independent peer review of the impact of the activity on species in the affected area.
63. In 2015, the Italian Ministry of Environment (MATTM) included as a mandatory requirement for the issue of a permit for oil and gas exploration, 60 day monitoring periods before and after the activity to gather information

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<sup>42</sup> Ibid fn 28

<sup>43</sup> *Convention on Migratory Species* Resolution 12.14, adopted October 2018



on marine mammal presence, density and distribution. Further, MATTM require the submission of a Monitoring and Mitigation Plan that includes: a bibliographic review of available information for the operation area to evaluate data on local marine mammals; acoustic modelling to calculate exclusion zones; the before and after phase survey details; and mitigation protocol details<sup>44</sup>. The collection and publication of this before and after data, in addition to data during seismic operations, may be used to inform mitigation measures and provide guidance for future seismic surveys. These regulations inform what may be considered best practice in regard to the content of a monitoring plan.

64. In 2016 a group of eminent marine scientists in America wrote to President Obama to express *profound concern over the impacts on [baleen whale] species from the introduction of seismic surveys for oil and gas exploration in the mid and south-Atlantic planning areas*. The letter stated that *Airgun surveys used for oil and gas exploration are known to have large-scale effects on baleen whale species, including the disruption of activities vital to foraging and reproduction over vast ocean areas*. The letter specifically requested President Obama's administration not to introduce seismic oil and gas surveys in the Atlantic.<sup>45</sup>

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<sup>44</sup> Fossati C. *ibid*

<sup>45</sup> Nowacek D. et al 2016 *A Letter To President Obama On The Impact Of Seismic Surveys On Whales*