South-West Coast Scientific Group

Response by the South-West Coast Scientific Group to the ConocoPhillips Otway Exploration Drilling Program Environment Plan

South-West Coast Scientific Group

The South-West Coast Scientific Group of the Clean Ocean Foundation comprises three retired academics, a Marine Biologist, a Medical Academic and a Physicist. We have a combined 50 years' experience in Marine Sciences and 35 years in evaluation of research for policy development.

We refer to the ConocoPhillips Otway Exploration Drilling Program Environment Plan in this document as the Environmental Plan (EP).

At ConocoPhillips' consultation in Warrnambool, the company's speaker objected to the use of the term 'seismic blast.' Nevertheless, we will use that term for any noise above 120dB.

We confirm that the Clean Ocean Foundation is recognised by NOPSEMA as a relevant person.

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Rejection of the ConocoPhillips Otway Exploration Drilling Program Environment Plan

We believe that the Environmental Plan (EP) should be rejected on the following grounds.

1. The Australian Government is currently developing National Anthropogenic Underwater Noise Guidelines.
2. The location of the drilling sites and extent of activity is unclear.
3. Failure to recognise the importance of krill, the **keystone species** in this ecosystem, biased and inaccurate assessment of the threat to zooplankton and inadequate recognition of that effect on the entire ecosystem:
    a. Zooplankton
    b. Fishes and Eels
    c. Cetaceans and Pinnipeds
    d. Birds
4. Inadequate recognition that noise-induced damage is cumulative and irreversible, and that noise-induced damage applies to the ecosystem (not just individuals).
5. Inadequate Risk Management Planning and Risk Mitigation.
6. Conclusion.
7. References.

1. The National Anthropogenic Underwater Noise Guidelines.

The Australian Government is currently developing National Anthropogenic Underwater Noise Guidelines, which include an update to EPBC Act Policy Statement 2.1 - Interaction between offshore seismic exploration and whales: Industry guidelines.

The Clean Ocean Foundation requests a moratorium on applications for approval of environment plans until the national guidelines have been completed.

A moratorium would protect NOPSEMA from reputational damage if it approved applications at a lower standard than will apply in the future**.**

2. The location of the drilling sites.

Where are the wells located? Why haven't they been marked on the maps? It is impossible to assess the impact of the drilling itself and the subsequent testing on the surrounding ecosystem unless the reader knows where they are. What is ConocoPhillips hiding if they are not prepared to identify the locations? Are there going to be more of them in the future?

We understood that CGG was going to undertake seismic surveys for ConocoPhillips. Why has this application been submitted ahead of CGG's? Is this the reason that the scope of ConocoPhillips activities has been so poorly defined?

3. The importance of krill, the *keystone* species in this ecosystem in the Environmental Plan, and biased and inaccurate assessment of the threat to plankton and inadequate recognition of that effect on the entire ecosystem.

a. Plankton

Marine plankton are classified as phytoplankton (plants) or zooplankton (animals). Zooplankton consume phytoplankton which form the basis of marine food webs. The abundance of phytoplankton can be measured by satellite imagery of Chlorophyl-A.

Phytoplankton are eaten by zooplankton which are eaten by small marine creatures which are eaten by larger ones. This is the cycle of marine life. The Operational Area (OA) is where baleen whales (e.g. Pygmy Blue and Southern Right Whales) eat plankton.

Zooplankton form the basis of marine food chains, and particularly Krill (Euphausiacea) are considered keystone species.[8] Keystone species "are only those species having a large, disproportionate effect, with respect to their biomass or abundance, on their community"[31] This means that any significant impact on keystone species has a cascading and widespread impact on the ecological community they support. While most zooplankton in the Bonney Upwelling do not fall into this strict definition, they do fall into the definition of key species because they drive ecosystem processes, energy flows, or both. Fundamentally these zooplankton form the basis and functioning of the wider Bonney Upwelling ecosystem and disturbance of these process will have knock-on effects. In the literature, there is no dispute about the overall importance of

zooplankton to the marine ecosystem functioning or over the importance of krill to whales as a food source.

The proposed ConocoPhillips operational area is 4,507.5 km^2 in depths ranging from 53 to 500m potentially impacting roughly 1,250 km^3 of oceanic habitat. We know that the noise associated with seismic blasting kills or seriously debilitates many zooplankton species[21,43], including killing krill larvae at least up to 1.2 km from the source of the sound. While the proposed surveys do not use the full seismic blast survey methodology, the sound levels produced by Vertical Seismic Profiling (VSP) systems of 210 dB re 1 uPa^2m^2s are similar to those of standard seismic blast surveys systems and similar mortalities are to be anticipated. Even the Sub-Bottom Profiling (SBP) levels (169 dB re 1 uPa^2m^2s) are high.

While ConocoPhillips has acknowledged that their acoustic surveys will impact zooplankton they have failed acknowledged the extent to which this is an issue. As is the case with previous applications of this type, key and significant information has been left out of the document and citations of sources of evidence have been incorrectly applied or studies referred to that have been thoroughly discredited. Nowhere in the application has ConocoPhillips stated that krill are the keystone species (as defined above). Keystone species status elevates the significance of krill from important (as stated in the application) to ecosystem critical (studiously avoided in the application). Further, their entire justification (in terms of literature citations) is based on the impact of seismic sound discharges on copepods as a proxy for zooplankton. Copepods are widespread, abundant and r-selected species (rapid growth, reproduction, recolonisation),Not all zooplankton fall into this category in this ecosystem, certainly not the keystone species.

McCauley et al.[21] showed that seismic discharges kill krill larvae up to 1.2 km from the sound source (sound discharges from VSP systems are of a similar magnitude. Assuming that the mortality of krill larvae is accurate (McCauley et al.[21]) and the operational area is 4,507.5 km^2, the proposed survey has the potential to kill all krill larvae across the entire survey. This amounts to approximately 1250 km^3 of water from which all larval keystone species (krill) are removed. The work of McCauley et al.[21] has been criticised by Richardson et al.[33] who suggest that zooplankton will recover within 4 days but this assumption is based on the life cycle of small copepods living in an energetic or high current environment and misunderstands the life cycle of krill. Krill (*Nyctiphanes australis*) have a breeding season that lasts several months. The eggs hatch and the larvae are released and reach adulthood in about 4 months (page 181 of ConocoPhillips Application). Given the length of time krill larvae spend in the areas vulnerable to VSP sound discharges (full water column), the scale of the potential mortality of larvae is immense (1,250 km^3). If even a fraction of the potential mortality of krill larvae is realised, it would have an immense impact on the populations of this keystone species. Krill only reproduce in the warmer months. Since entire year-classes of larvae would potentially be killed, the notion that they will recover in 4 days[33] is ludicrous. Their life cycle does not allow it.

The Clean Ocean Foundation wishes to see that the importance of plankton, especially krill, is better described in the EP.

There is an absence of knowledge regarding the impact of seismic based survey methods on marine zooplankton. The limited knowledge that we do have is for surface surveys. We know nothing of deeper water impacts. The EPBC Act specifically states that lack of scientific knowledge is not a sufficient reason to allow a damaging activity to occur. The mortality of krill larvae caused by seismic blasting has been shown in shallow surface waters, but the results imply

a catastrophic level of mortality to those larvae beyond our currents surveys. These observations, in their entirety, provide evidence that seismic surveys should not be permitted (in any form) in the proposed region as they destroy the food source for the Pygmy Blue Whales, seabirds, and other species. We already have evidence that the whales themselves have been losing condition over the last 20 years (Peter Gill, Personal Communication). The distribution and productivity of the Bonney Upwelling occurs over a much larger geospatial range than described in the EP, which is why blue whales are found in the proposed OA. We understand that an application has been made to the Department of Climate Change, Energy, the Environment and Water to extend the Blue Pygmy Whale Biologically Important Area to the Operating Area proposed by ConocoPhillips.

The Clean Ocean Foundation requests NOPSEMA to withhold approval until the application for an extension of the BIA has been decided by DCCEEW.

The Clean Ocean Foundation regards these risks to the marine fauna as reason to reject the ConocoPhillips application and EP.

Richardson et al.[33] critiqued the work of McCauley et al.[21] suggesting that while the impact of the mortality on zooplankton may occur, that the recovery rates would render the problem negligible. A critical review of the report shows that the work cannot be used in a scientifically valid way to reduce the importance of McCauley et al.[21] Among the limitations of Richardson et al.'s report are:

1. The modelling is being used to argue against direct observations. This is not how modelling is used scientifically. Models cannot negate the observed real evidence; rather observed evidence is used to inform and modify modelling such that it better reflects reality.
2. The model is not a peer reviewed report and has not been published in the scientific literature. This means that it is the opinion of its three authors. Further, the report was funded by the industry's lobbying organisation, the Australian Petroleum Production and Exploration Association (APPEA), which greatly damages the report's independence and credibility.
3. The modelling was based on small zooplankton with several-day reproductive time scales from the Northwest Shelf, a high current region. Krill was not included. Zooplankton abundance, species composition and diversity in tropical areas are substantially different compared with those in temperate environments,[9] and the high current regimes of the Northwest Shelf do not apply to temperate Australian waters. Extrapolating what may or may not occur from a tropical to temperature environment tells us little about the Bonney Upwelling and the OA.
4. The authors use the CSIRO's Ocean Forecast Australia Model (OFAM) to represent the upper ocean circulation around Northern Australia in which they seed particles (representing reproducing populations of zooplankton) uniformly across a hypothetical survey site. The model assumes (in substantial error) that zooplankton populations are uniformly distributed across the ocean. They are not. This has been clearly shown[9,19].
5. The authors attempt to model the growth of populations of all zooplankton (all species combined) using a simple logistic model to estimate the population growth across time. Apart from the substantial confounding across species (i.e. the life cycle of krill species is completely different from the average copepod), the model assumes a carrying capacity which they estimate in summer from other CSIRO sources. Carrying capacity of an environment for any species or group of species is not static; it varies both across time

and space. Since the carrying capacity of the system is critical to the size of the population and how much it can grow, this single estimate that drives the model is inadequate. This becomes a one-time estimate of population size potential based on an assumed uniform seeding level. These are compounding errors rendering the results largely meaningless.

6. The model uses a simplistic approach in calculating zooplankton mortality and population growth. They correctly state that natural mortality is very hard to estimate in the wild and then go on to use natural mortality estimates based on laboratory studies. To state the obvious, these are mortality rates in the laboratory, not the wild, and are meaningless in this context. Natural mortality in the wild varies by size, across space and across time (predation, availability of resources, etc.). A simplistic one-off value tells us very little about the recovery rate of an impacted population. This is a compounding error of the approach.

This study amounts to an exercise in modelling, but the approach is simplistic and does not contribute to assessing the impact of seismic blasts on the population of zooplankton in the Bonney Upwelling and the OA, nor for that matter in the NW Shelf environment. The zooplankton species are different, the baseline assumptions used in the model do not apply to the Bonney Upwelling and thus are fundamentally flawed, and there are compounding oversimplifications in the calculation methodology. The model used is essentially a steady state model. These approaches were widely used in fisheries for decades and have ultimately been discarded because they simply do not represent real-world ecological interactions or processes.

Significantly, in the final section under Model Caveats, Richardson et al.[33] acknowledge many of the above limitations in their approach and the limited usefulness of their results. They are important limitations, but they only appear at the end of the document and not in the executive summary. Furthermore the initial report produced by Richardson et al.[33], on which the Australian Petroleum Production and Exploration Association (APPEA, now Australian Energy Producers) publication is based, explored what would happen if they "turned the current down" to something realistic for southern Australia. This model run resulted in the recovery rate for small three-day life cycle zooplankton exposed to a 3D seismic survey increasing from three days to three *weeks*. This sobering result was not presented in the APPEA paper. Furthermore, these APPEA paper results have been widely misrepresented by APPEA and the gas industry to justify seismic blast surveys.[36] This is willful misrepresentation of the available data. Finally, this report has not been published in the scientific literature. Would it survive scientific peer review by a high-ranking journal as McCauley et al.[21] has? One can now add the results of an independent study of how small copepods respond to exposure from small air gun signals[43], where the results support the findings of McCauley et al.[21].

The Clean Ocean Foundation asks ConocoPhillips to accurately represent the findings of McCauley et al.[21]

The Clean Ocean Foundation asks ConocoPhillips to desist from quoting Richardson et al.[33] until their report has been peer-reviewed and published in the literature, and not just by APPEA/CSIRO.

The Clean Ocean Foundation asks NOPSEMA to set aside any studies funded by the industry lobby group APPEA. This is apprehended bias, which prevents unprejudiced consideration of the facts and may result in selecting one preferred outcome over another, as we have indicated above.

A second publication, the work of Fields et al.[14], has been used to counter the research of McCauley et al.[21]. This paper examines the mortality of copepods (specifically *Calanus finmarchicus*) to seismic blasts but has absolutely no bearing on the issues with respect to the zooplankton in the Bonney Upwelling. The McCauley at al[21] study stated, quote, "The 'copepods dead' category was dominated by the smaller copepod species (*Acartia tranteri, Oithona spp.*)". These copepods had an average size of 0.5 mm, while the Fields et al.[14] copepods *Calanus finmarchicus*, were about 2.5 mm in length or five times bigger than those in the McCauley et al. study, which reinforces their observation that smaller copepods were more susceptible to damage. Vereide et al.,[43] using similar size copepods as that of McCauley at al.,[21] obtained similarly higher mortality resulting from air gun signal exposure. In addition, the Fields et al.[14] copepods are not a species of zooplankton present in this environment, but more significantly, McCauley et al.[21] clearly states that there is a substantial issue with krill mortality. Krill was not part of the Fields et al.[14] study.

b. Fishes and Eels

The impact of seismic surveys on fishes has not been widely addressed. Much of the work has been conducted using modelling approaches where estimates of impacts have been established based on the physical structure of various organs, the use of caged experimental studies and laboratory research. The state of the science was reviewed by Carroll et al.[10] who provided a detailed summary. After this paper there has only been one additional study of particular note.

Table 1, taken directly from Carrol et al., examined 28 studies on adult/juvenile fishes, fish eggs, fish larvae and elasmobranchs (sharks). The red, yellow and blue highlighted parts of the table indicate possible or measured responses to seismic sounds, representing 24 of the 28 studies (86%). The green represents studies that found no impact of seismic surveys (17 of the 24 studies - 71%). The percentages do not sum to 100 because some of the studies found both positive and negative responses.

While these data are in themselves concerning when it comes to assessing the impact of seismic surveys based on a precautionary principle, there are two fundamentally significant further issues shown here. Firstly, Carroll et al.[10] failed to find, and thus refer to, any research identifying community level impacts on fishes or sharks. It is not listed on the table and none of the papers referred to address these concerns. Community impacts refer to how the fish assemblages may change with time (periods > 1 year) because of components of the assemblages suffering significant damage (i.e. changes in abundance of some species and/or groups of species that potentially lead to cascading ecosystem impacts). Secondly, the grey areas in the table refer to aspects of seismic survey impacts that have not been researched. **Thirty-seven of the 40 (93%)** possible categories of study that we should have some data (excluding categories unlisted) have no usable information to allow us to assess the potential impact of seismic testing on the most diverse group of vertebrates in the world. Marine fishes constitute ~14,800 of the ~33,000 species of fish with another ~900 elasmobranchs (almost entirely marine). It is estimated that there are approximately 45,000 vertebrates.

Based on Carroll et al.[10,] and an understanding of the diversity of marine fishes and sharks, seismic surveys are proceeding in an **information vacuum**. Attempts to use data gathered from the Northwest Shelf (a tropical ecosystem) and apply them to the Bonney Upwelling region (a temperate ecosystem) are scientifically flawed. The Precautionary Principle should be applied to the environmental impact.

The application provides information on the impact of seismic discharge levels on fishes and sharks from modelling exercises, but there is no attempt to provide real world data or reference to even the scant published scientific literature available. The assumption appears to be that the area impacted is minimal and that thus the level of impact will follow. The impacted area is approximately 1250 km^3. This is not minimal.

The Clean Ocean Foundation proposes that in our current state of limited knowledge, the Precautionary Principle should be applied.

The Clean Ocean Foundation asks NOPSEMA to set aside any studies conducted by members of APPEA, i.e. The Australian Institute of Marine Sciences who were the first, last and seven of twelve authors[24]. This is again bias, which prevents unprejudiced consideration of the facts and may result in selecting one preferred outcome over another, as we have indicated above.

The proponents of seismic surveys have argued that these processes have been widely conducted in southeast Australia over many years and that there has been no scientific evidence suggesting that any negative effects have occurred. Based on the work of Carroll et al.[10], the most obvious reason for no evidence that negative impacts have been found is because no studies have been conducted that specifically look for them. Moreover, there is anecdotal evidence from commercial fisheries which confirms negative impacts that seismic surveys have on fishes.[13,25,39]

	Adult/juvenile fish	Fish eggs/larvae	Elasmobranchs
PHYSICAL			
Swim bladder damage	1,2		
Otolith/inner ear damage	3	4	
Temporal Threshold Shift	5	1a,3a	
Permanent Threshold Shift	5		
Organ/tissue damage	1,2,6		
Mortality	1,2,6-11	12-14	13,15
BEHAVIOURAL			
Startle/alarm response	1,8a	6,7,8a,9,16,17	
Sound avoidance/migration*	9,18-20	7,12,16-18,21-23,24a	18
Other changes in swimming	20		
Predator avoidance			
Foraging			
Reproduction			
Intraspecific communication			
PHYSIOLOGICAL			
Metabolic rates			
Stress bio-indicators	16	6a	10a
Metamorphosis/settlement			
CATCH EFFECTS			
Catch rates /abundance	7,19,25,26	21-23	12,18,23,27,28

1= Popper et al. 2005*, 2 = Popper et al. 2016*, 3 = Song et al. 2008*, 4 = McCauley et al. 2003, 5 = Hastings and Miksis-Olds 2012, 6 = Santulli et al. 1999, 7 = Hassel et al. 2004, 8 = Boeger et al. 2006, 9 = Wardle et al. 2001, 10 = Radford et al. 2016*, 11 = McCauley and Kent 2012, 12 = Dalen and Knutsen 1987, 13 = Booman et al. 1996, 14 = Payne et al. 2009, 15 = Kostyuchenko 1973, 16 = McCauley et al. 2000, 17 = Pearson et al. 1992, 18 = Løkkeborg et al. 2012, 19 = Pickett et al. 1994, 20 = Peña et al. 2013, 21 = Skalskiet al. 1992, 22 = Slotte et al. 2004, 23 = Engås et al. 1996, 24 = Chapman and Hawkins 1969, 25 = Miller and Cripps 2013, 26 = Thomson et al. 2014; 27 = Løkkeborg and Soldal 1993, 28 = Przeslawski et al. in prep.

1a: Statistically significant hearing loss immediately upon exposure of freshwater adult Northern Pike to 5 pulses at 400 Hz and exposure of Lake Chub to 5 and 20 pulses at 200, 400 and 1600 Hz. Recovery within 18 hrs. A shift was observed only in adults and not in juvenile Pike.
3a: Adult freshwater Northern Pike and Lake Chub exhibited temporary hearing loss, but no damage to the sensory epithelia studied in any of the otolithic end organs, demonstrating that hearing loss in fishes is not necessarily accompanied by morphological effects on the sensory hair cells.
8a: Repeated exposure to air guns resulted in increasingly less obvious startle responses in effected fish, indicating possible habitation to the disturbance.
10a: Fish exposed to playbacks of pile-driving or seismic noise for 12 weeks no longer responded with an elevated ventilation rate to the same noise type, and showed no differences in stress, growth or mortality compared to those reared with exposure to ambient-noise playback.
24a: Free ranging Whiting school responded to airgun sound by shifting downward, temporary habituation was observed after one hour of continual sound exposure.
* Includes changes in vertical/horizontal distribution.
*Freshwater/brackish species.

KEY

Response at realistic exposure levels	Possible response (conflicting results)
Response at unrealistic/unknown exposure levels	No data, has not been tested
No response at either realistic or unrealistic exposure levels	Not applicable

Table from Carroll et al. (2017)[10].

Damaging impact of seismic blasting on short fin eels.

Short fin eels have an immense cultural value for the indigenous peoples of South-West Victoria, forming the basis of a UNESCO World Heritage site at Budj Bim. Their cultural connection to the land and the eels stretches back 40 to 60 thousand years which Australia has global responsibilities to protect.

Eels have a unique life cycle with adults migrating to the ocean in spring and migrating from South-Western Victoria all the way to the Coral Sea to their spawning grounds. Those that survive this long and arduous journey reproduce in the deeper waters and then die – they only reproduce once in their lifetime. This means that reproducing animals do not get a second chance and anything that reduces the number of eels reaching their spawning grounds has a negative impact on the numbers of offspring. The spawned eggs hatch into larvae and these then use the currents to drift back down the Australian east coast and migrate back to the rivers from where their parents came.

It is well known that seismic blasts kill fish. We also know that these surveys change the behaviour of fish: they can disorientate them and they can make them more vulnerable to predators, and other adverse impacts. Specific information about seismic blasts relating to short fin eels is absent but the effects on other kinds of eel are damaging.[1,32,35,37] We have no reason to believe that short fin eels are any different.

Eels are vulnerable throughout their life cycle. Adult eels have a single opportunity to successfully reproduce. They are already under significant pressure from climate change, impacts on the land that pollute their rivers, and water extraction. Larval eels return on ocean currents to South-West Victoria as part of the zooplankton. These currents pass through the OA.

Studies have shown that seismic blast surveys kill about 64% of zooplankton out to at least 1.2 km[21] from the sound source and so larval eels are almost certainly killed by these activities. Adding an additional pressure to these already vulnerable animals is irresponsible and a breach of our duty to protect World Heritage sites and cultural traditions that may be 60,000 years old and ignores consultation with Indigenous groups who venerate the importance of eels to their society.

We accept that there are multiple impacts that are harming the number of eels returning to South-West Victoria. However, we have control over whether or not there are seismic blast surveys in the Otway Basin. As we have every reason to believe that these seismic blasts are damaging the eels stocks through disruptions to their migration patterns, we have a social and legal responsibility to protect these vulnerable animals from known damaging activities like seismic blast surveys.

c. Cetaceans and Pinnipeds

In this section we focus on groups of animals (other than fishes) that are prevalent in the Operational Area that is embedded within the Bonney Upwelling system. These feed on a variety of invertebrates and small fishes and are considered the most vulnerable of the species in the region, for example Pygmy Blue Whales.[27]

As detailed elsewhere, air-gun discharges are in fact explosions and have a well-documented history alluding to their impact on marine mammals. As far back as Aubrey et al.[7], who reported on the use of "seal bombs" with sound exposure levels of 190dB re 1 μPa^2-s at 1 m to deter seals

from impacting commercial fish catches. 190dB is two orders of magnitude less than the ~230dB associated with seismic blasts (the distance that these sounds travel is well documented: see McCauley et al.[21]).

Potential impacts of noise include interruption of essential behaviours[46], masking signals of interest (e.g., the sounds of predators, conspecifics or prey)[17], displacement from crucial habitat[11], direct physical injury including temporary or permanent hearing loss[16,20], and in extreme cases, death[15].

NOPSEMA is well aware of the issues associated with air-gun discharges, especially those of seismic surveys.[2,3] A common thread with the environmental plans approved by NOPSEMA is the acceptance of the use of literature and hydro-acoustic modelling to form the basis of determining the degree of impact of seismic survey activity on this group of animals (and others). We find no reference to requirements that the organisations proposing seismic surveys, including VSP, do anything further to determine the potential damage. The two examples provided stipulate a 10-km buffer (around the seismic source) for the protection of whales (Southern Right, Pygmy Blue) and primarily by association pinnipeds and birds.

NOPSEMA's responses states "NOPSEMA required the titleholder put in place effective whale detection and control measures to demonstrate that blue whales would not be injured or displaced from foraging in BIAs. In response, the titleholder included a 10-km observation zone that applied to the foraging BIA and a 10-km buffer; 10-day interval aerial surveys; the use of passive acoustic monitoring; and trained marine fauna observers / PAM operators to implement a shutdown of the seismic array should a blue whale be detected entering the shutdown zone of an active seismic source" (https://docs.nopsema.gov.au/A702829) with respect to blue whales.

We presume that the 10-km range comes from a day time only, 3-km visual search distance from the survey vessel (onboard observers) and 10 km from 10 day interval aerial searches for whales. Both requirements are inadequate based on simple calculations of blue whale cruising speeds and dive durations. With respect to the 3-km visual searching for whales, the dive duration of such whales is variable, typically of the order from a few up to fifteen minutes, depending on what the whales are doing. Owen et al.,[29] and Davenport et al.[12] used a single Pygmy Blue Whale tagged with a high-resolution tag attached for seven days to give an average dive time of 7.6 minutes and maximum of 17.5 minutes. Thus, in a single dive, these whales can move ~1.3 km in 7.6 minutes or 2.9 km at their maximum dive time (while cruising) and substantially farther at higher speeds. This suggests a whale can easily move from visible range to beyond without being detected. The point here is that from simple observations of the behaviour of blue whales[29], the requirements of seismic survey shutdown specified by NOPSEMA to prevent harm to whales in the Bonny Upwelling cannot be achieved at all either by onboard observers or aerial surveys. This argument is equally applicable to southern right whales (dive time < 33 min)[6]; maximum speed ~ 17km/hr[4]; and Australian fur seals (dive time 6 min, cruise speed 9 km/hr[5]).

With the information provided in the previous paragraph, we note that the Federal EPBC Act states with respect to Pygmy Blue Whales that "The risk of physical impacts is minimised by implementation of the practical measures outlined in the EPBC Act Policy Statement 2.1 – interaction between offshore seismic exploration and whales. While the seismic guidelines advise that seismic surveys should be undertaken outside of biologically important areas at biologically important times". It further states that "it is not known at what distance from a seismic source, behavioural impacts may occur or the extent of any behavioural impact".

Based on the requirements of the EPBC Act, it is incumbent upon the proponents of the seismic surveys to understand the range impacts of their surveys on the whales. The 10-km range has no basis in the scientific literature and is easily debunked by simple whale cruising speed and diving behaviour calculations. It appears to be based on the modelling criteria of sound propagation in waters from sound propagation models and has no replicated and published scientific literature to support it.

The Clean Ocean Foundation asks that ConocoPhillips justifies the use of 10 kilometres as the safe range.

Further, "Under the EPBC Act, environment assessments are undertaken to support environmental and heritage protection and biodiversity conservation. A person must not take an action that has, will have or is likely to have a significant impact on any of the matters of environmental significance without approval from the Commonwealth Minister for the Environment. An action is a project, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things". The actions and activities of NOPSEMA and the proponents of such activities with respect to seismic surveys, at face value, are a breach of the obligations under the EPBC Act.

The Clean Ocean Foundation asks that ConocoPhillips complies with the EPBC Act.

We observe that Action Area A.2 of the Blue Whale Conservation Management Plan states "Anthropogenic noise in biologically important areas will be managed such that any blue whale continues to utilise the area without injury and is not displaced from a foraging area". This requirement is in place regardless of activity type (migration, foraging, breeding), behaviour (nursing, singing, resting, etc.), time of year, and time frame of use. There is some evidence that blue whales feed year round[26]. Blue whales must be able to use Biologically Important Areas without injury.

The Clean Ocean Foundation contends that the EP is inconsistent with the Blue Whale Conservation Management Plan and we respectfully request NOPSEMA to not accept the EP.

In addition to the above, we can demonstrate from the scientific literature that the impact of seismic surveys, regardless of the modelled sound levels, propagation or received sounds by whales, has impacts well beyond the specified 10 km range.

In 2019, Kavanagh et al.[18] published a paper in Nature (across large spatial scales and multiple species) showing negative impacts on both baleen and toothed whales. They modelled data from whales observation (> 8,000 hours) covering an area of more than 880,000 km^2 finding a significant negative impact of seismic activity across species and habitats. Their results found an 88% (82–92%) decrease in sightings of baleen whales, and a 53% (41–63%) decrease in sightings of toothed whales because of seismic surveys (compared with control surveys). Weilgart[44] presented a conference paper to the "CBD Expert Workshop on Underwater Noise and its Impacts on Marine and Coastal Biodiversity" that lists a wide variety of impacts of seismic noise on marine mammals. Among many salient issues raised (with associated reference to the scientific literature) are the observations of Richardson et al.[34] who state that there were changes to dive durations and breathing patterns in bowhead whales up to 54–73 km from seismic surveys at received levels that could be **as low as 125 dB re 1µPa**.

These examples demonstrate significant issues with impacts of seismic survey noises on cetaceans. Again, we are presented with the counter argument that seismic surveys have been in operation in the Bonney Upwelling regions for decades and there does not appear to be an effect. We respond with the same statement as above that few resources have been provided to assess the impact, hence no observations have been made. The level of impact on cetaceans and other species in the area is assessed based on hydro-acoustic modelling methods rather than on the direct measurement of the impact of the animals in question. Modelling does not inform the debate, only replicated experimental studies with the animals in question. If ConocoPhillips believes that its surveys have not had an impact on the marine environment, it should fund independent baseline and follow-up surveys of the OA.

The Clean Ocean Foundation requests a response from ConocoPhillips about how it will accommodate the information about whale movements and speed, and safe distance from seismic blasts.

We have focussed on the whales here, but this does not lessen the significance of other species present in the ecosystem. The whales represent the species with the widest and quickest movement capability. What about the species with less mobility (e.g. benthic fauna)? We would expect these to be protected with a more stringent strategy (EPBC Act) established to consider the whales.

d. Birds: Seabirds and Migratory Shore Birds.

Seabirds highlight the interdependence in the ecosystem, starting with krill. Some seabirds such as shearwaters and petrels, prey directly on krill. Others, such as gannets, terns and albatross, as well as tuna, prey on bait fish that may have fed on krill.

There is only one published scientific study of the effect of seismic surveys on birds which was carried out on the African Penguins.[30]

A detailed source of vulnerable and endangered birds in the OA is Cornell University's database called eBird[40] which is a compilation of citizen scientist birdwatchers' records. For recent data on seasonal presence and relative abundance of seabirds around the OA, the following link is relevant. Port Fairy Pelagic, Lady Julia Percy Island, VIC, AU - eBird Hotspot

Table 4-4-9 of the EP lists the species present in the OA. Most are categorised as threatened or endangered, and several as critically endangered. The plankton-rich OA is an important feeding area as maps in the Seabird Atlas show, as do images of chlorophyll A (Figure 1, below).

On page 27 of the Wildlife Conservation Plan for Seabirds 2022, it states "Proposals for oil and mineral exploration and exploitation should be adequately assessed, and as appropriate, conditions imposed to ensure there are no adverse effects on seabirds or their habitats."[45]

Some measure of the importance of the OA for local birds like the Sooty Shearwaters breeding on Griffith Island, Port Fairy, and the distant ones can be inferred from the presence of the Campbell Island Albatross. It only breeds on Campbell Island group, New Zealand's furthest south sub-Antarctic Island at 52.54°S, 169.14°E.

The Clean Ocean Foundation believes that seismic surveys in the OA imperil large populations of vulnerable, threatened, endangered, and critically endangered birds, and that ConocoPhillips has not assessed the risks accurately.

Little Penguins

The Little Penguin is a tourist attraction around the Otway Basin. To the best of our knowledge, no research has been done on the effects of seismic blasting on the Little Penguin, or as significantly, on its prey species. There have been observational reports of the strong impact of blasting on Southern Rockhopper Penguins which were found floating unconscious near blast sites off Marion Island and Saldhana Bay, South Africa.[30]

There is only one published scientific study which was carried out on the African Penguins.[30] Within 100km of their colony, penguins showed avoidance of their preferred feeding areas during seismic activities, leading to increased effort for their overall foraging. Longer term repercussions on hearing could not be excluded.

A report in the New Zealand Herald, 17th January 2018 stated:[28]

"I don't see why it wouldn't hold for our little penguin, especially if the blasting overlaps with foraging habitat like in the South African study," University of Auckland marine scientist Associate Professor Craig Radford said.

"These little guys spend a considerable amount of time at sea foraging and if they are as sensitive to sound as the South African species then there is the potential to disrupt their foraging behaviour."

Dr John Cockrem, a professor of comparative endocrinology, said "Seismic surveys conducted within 100km of Korora foraging areas could have adverse effects on breeding success and survival of the penguins."

Middle Island penguins have not been studied by tagging so their feeding range is unknown. Little Penguins are hard to spot because they are under the water much of the time. The peak month for sightings in January. About 10% of sightings are beyond the Continental Shelf. Little Penguins have been seen in or near the OA between February and April at almost 40°S. As the Little Penguins in Warrnambool are at latitude 38.3°S, this is a distance of around 200 km.

Penguins are among the most threatened bird families, largely due to the negative effects of competition with fisheries, climate change and oil pollution.[8] The Precautionary Principle should be applied. No blasting should occur within 100km of the range of Little Penguins. The OA is within that range.

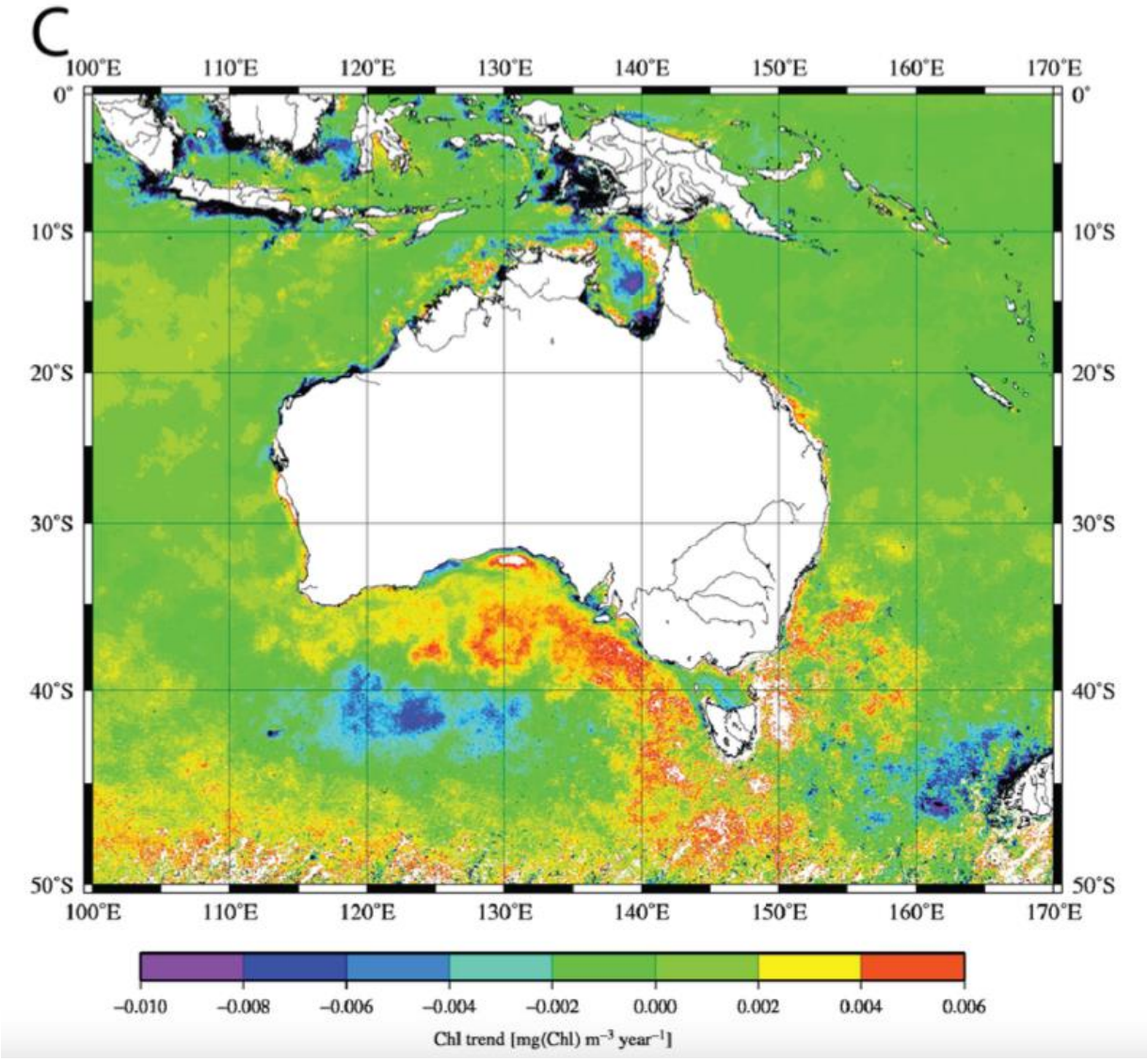
Finally, Australia has international treaty obligations to protect albatross and other sea birds.

The Clean Ocean Foundation advises NOPSEMA to reject the ConocoPhillips application because of its threat to birds. The Clean Ocean Foundation asks that ConocoPhillips reassess the importance of the plankton-rich Operating Area for whales, dolphins, seabirds, transit of returning eel zooplankton, and other species.

An accurate and comprehensive way to examine the impact of the upwelling is to look at the productivity that it produces and where it spreads which is better done with satellite images of chlorophyll (nutrients feed the phytoplankton which feed the zooplankton) (Figure 1 above).

The bright red colours represent regions of high chlorophyll A, thus areas of high phytoplankton density and consequently areas of high zooplankton density (including krill).

Figure 1. Trends in Chlorophyl A in the Australasian region between 2003 and 2019 (Thompson et al. 2020)[41]



A simple comparison of the chlorophyll density, the proposed survey area and the Bonney Upwelling region shows the actual upwelling zone (proper) does not overlap with the seismic survey area. The productivity (as measured by chlorophyll) that is entirely the result of the Upwelling completely intersects with the survey region. Thus, the argument that the proposed seismic survey avoids the Upwelling is correct only in that it is misleading. It avoids the regions where the nutrient rich waters reach the surface, but it fully overlaps where the nutrients produce phytoplankton and result in the productivity sufficiently large to support krill, blue whales, and other vulnerable and endangered species.

The consequence of this observation in relation to the mortality that krill will be subjected to by the proposed seismic activity is potentially a very damaging impact to the only food source of blue whales. It is worth noting that krill are obligate schooling animals – they will always form large schools. This makes it difficult to determine whether the total abundance of krill has declined until it is too late; a well-known problem in many schooling fish fisheries.

The misalignment of the seismic survey with the actual productive waters of the Bonney Upwelling is a major flaw in the application and substantially hides the potential true impact of the process. This needs to be much better understood before any approval is given to the surveys.

The Clean Ocean Foundation asks ConocoPhillips to include in its application a map that shows the continuity of plankton between the Bonney Upwelling and an area that extends beyond the OA.

We reaffirm that the EPBC Act specifically states that lack of scientific knowledge is no reason to allow a particular activity to proceed. There is a clear lack of knowledge demonstrated here by the applicants, but it remains unclear whether this is through a poor understanding of the Otway Basin ecosystem or if it is wilful ignorance.

4. Inadequate recognition that noise-induced damage is cumulative and irreversible, and that noise-induced damage applies to the ecosystem (not just individuals).

The Environmental Plan does not specify the extent and duration of the SBP tracks and so the total area exposed to the SBP acoustic sources cannot be determined. More importantly, the drilling sites have not been specified and so the area affected by the impulse noise of the VSP testing cannot be identified. One significant problem is the choice of the exposure level of noise that is determined to be harmful, given that noise damage is cumulative, permanent, and irreversible – the hearing damage does not heal.

The sound levels chosen for temporary- (TTS) and permanent-threshold shift (PTS), i.e. temporary and permanent hearing loss, are obtained from a variety of sources. There are extremely limited real data on the more-damaging impulsive noise hearing loss onset for marine mammals across a range of exposure frequency conditions. Moreover, these limited data are for captive seals or dolphins and are based on avoidance behaviour or brain electrical activity. Almost nothing is known about the effect of intense impulses of noise on crustaceans, fish and invertebrates and there are no data at all for the baleen whales, such as the iconic Pygmy Blue Whale or Southern Right Whale, that are the more well-known and important species in the Operational Area.

The estimation of hearing parameters relies upon extensive assumptions, extrapolation, and mathematical modelling of hearing using anatomical parameters, characteristics of sound production, and assumptions based on other species. Consequently, the TTS values taken from Southall et al.[38] that are used as "safe" levels are purely estimated from these mathematical fitting functions using non-impulsive noise and single (in most cases) individuals. The situation is worse for the far more concerning permanent hearing loss where there are no data at all! That the levels used for permanent hearing loss are arbitrarily set to be 20dB higher than those for temporary loss is ludicrous.

When various species are grouped together, based on biological similarities, the group audiograms use median values of individuals of different species, leading to substantial individual variability. There are insufficient data to analyse the variance. Taking just the mean value does not make sense. Each dose of noise contributes incrementally and permanently to hearing loss. Confidence levels are required to be stated. By way of analogy, using the median would be equivalent to a toxicologist advising that a new drug would be acceptable if only 50% of people were killed by it (the LD50 level). The precautionary principle requires taking the lowest confidence interval as the safest step.

The Clean Ocean Foundation requests that ConocoPhillips provide the confidence intervals for all the data used. Without these, the data are incomplete and insufficient to determine "safe" levels.

Despite this lack of actual real knowledge of the hearing damage caused by intense noise pulses from air guns, the Environmental Plan uses very high values for the "safe" (no effect) levels, selected from older works with no measures defined and only superficial observational data. (Only the levels for the more charismatic whales have had lower values selected.) Recent work suggest that these values are much too high, and using them will increase the stress on populations, especially those endangered populations that are already under threat and for which there is no evidence about safe noise levels.[21]

While the greatest damage occurs to animals nearer the sound source, the number of damaged animals increases farther from the source. (The area of the affected zone and thus the number of affected animals increases with the square of distance.) Unfortunately, the simple "all-or-nothing" approach preferred by regulators, where it is assumed that all animals whose exposure is below the RLp50 threshold are completely unaffected and all above are affected, severely underestimates the number of animals affected by the stressor. The authors have provided an example in which this "all-or-nothing" approach underestimates the number of affected animals by a factor of 280, i.e. there are **280 times** as many animals affected than what the "all-or-nothing" calculation would suggest.[42]

It is suggested that, along with the mathematical model of the noise distribution in the water, the determination of the number of affected animals uses a dose-response function coupled with the actual distribution of the animals.[42] Ignoring these factors can lead to significant errors in estimates of the area and numbers of animals affected. In addition, the selection of the exposure threshold also requires information on the proportion of the population that will be protected.

The Clean Ocean Foundation requests that ConocoPhillips provide information on what proportion of the population they will consider to be unaffected and how they will go about estimating this.

The Clean Ocean Foundation requests that ConocoPhillips use a dose-response function rather than assuming 50% of the population will be unaffected and provide details of the dose-response function used.

The Clean Ocean Foundation requests that ConocoPhillips provide the population distribution that is used in any calculations and what number of animals are in within the range of damage that are not observable from the MODU and its support vessels.

Given that the Blue Whale Conservation Plan stipulates that "any blue whale continues to utilise the area without injury", the Clean Ocean Foundation request ConocoPhillips

to provide comprehensive justification as to how the Environmental Plan demonstrates compliance with this requirement.

The consequences of the acoustic discharges are not just confined to hearing loss. A recent study demonstrated that these acoustic discharges are likely to prove deadly to zooplankton out to at least 1.2km from the source.[21] This was the limit of the published survey and so it is likely that mortality occurred beyond the 1.2km reported. Considering that this study used a small 150 cubic-inch air-gun, **even the suggested 750 cubic-inch air-gun array** (which could be larger) to be used in the VSP will certainly cause mortality out to a greater distance. These are alarming findings on zooplankton that underpins the entire food chain. Intense acoustic discharges will increase the stress on populations, especially those endangered populations that are already under threat and for which there is no evidence about safe noise levels.

The Clean Ocean Foundation requests that ConocoPhillips undertakes additional valid studies (independent, in-field, and spatially representative) to determine the actual range and impact that repeated intense acoustic discharges over the full duration of their testing has on zooplankton, and to determine the true recovery time for zooplankton on the completion of that testing.

No information has been provided on the location of the VSP sites and so their effect on the animals in the test zone cannot be determined. Neither has information been provided on the actual area being exposed to SBP noise, or the total time that animals in the test zone are being subjected to it.

The Clean Ocean Foundation requests clear clarification on the total area affected in the various tests.

It is well known that excessively loud noise causes damage to the ear and that this damage is both cumulative, permanent. As the ear does not recover from cumulative damage, it is essential to minimise the total exposure to excessive noise levels. The question, then, is what is the definition of excessive?

As discussed earlier, there is a real lack of actual measured knowledge of the hearing damage caused by intense impulse noise, the most dangerous kind, from air guns. The values selected as "safe" do not consider the cumulative effect of repeated high-intensity impulses over an extended period. These values are somewhat arbitrarily selected from the modelling of short-duration continuous (non-impulsive) noise and extrapolated to other species for which no data exists. The recent work that is reported in well-respected scientific journals, such as that of McCauley et al.,[21] suggests that the so-called "safe" values are much too high, and that there is a real risk of permanent hearing damage occurring to those animals in the survey area. Almost all of these cannot swim fast enough to escape from the blast zone, despite the use of a "soft" start to each line.

The Clean Ocean Foundation requests ConocoPhillips to provide information on the cumulative impacts on fauna from noise generated by its operations.

We understand that JASCO's modelling of the Scarborough Gas Field demonstrated that blue whales may suffer temporary injury as far as 60 kilometres from the sound source.

The Clean Ocean Foundation asks ConocoPhillips to accept the 60-km range or, if they do not, to explain the difference between the Scarborough models and its models for the Otway Basin.

The Clean Ocean Foundation asks NOPSEMA to make available the JASCO report presented for the development of National Anthropogenic Underwater Noise Guidelines, which includes an update to the EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales: Industry guidelines. We also request copies of all independent reviews of the JASCO document.

The Clean Ocean Foundation asks NOPSEMA to set aside any studies conducted by members of APPEA, who have been funded by the industry to conduct the above studies. This is again apprehended bias, which prevents unprejudiced consideration of the facts and may result in selecting one preferred outcome over another, as we have indicated above.

5. Inadequate Risk Management Planning and Risk Mitigation.

One of us has 20 years' experience of risk management planning using AS/NZ ISO 31000:2018 and its predecessors. That experience includes operational use and teaching students to Masters level in Australia, China and Singapore. He has marked approximately 800 risk management plan assignments.

The three key elements in risk planning are listing the risks, assessing the consequences and likelihood, and risk mitigation.

This risk management plan is not based on the full scientific evidence and needs to be rewritten. Risks and consequences have been consistently understated.

The Clean Ocean Foundation invites ConocoPhillips to submit two risk management plans. The plans should cover identification, assessment, mitigation, management and consequences to both-

1. **Marine life and species, individually, and**
2. **Overall ecosystems, habitat and food chains.**

The contents on page 337 of the EP give clear reasons why this application should be rejected. In Table 5-1, (Consequences Descriptions for Impact and Assessment) it states that the environmental, social, economic and cultural impact of major and high risks can be catastrophic. Both major and high risks are stated to be outside ConocoPhillips control requiring international and long-term oil spill response organisation resources. We know all too well the consequences of these disasters. For instance, we know about the catastrophic impact of the BP oil spill in the Gulf of Mexico. It killed approximately 25,900 marine mammals, fish, 82,000 sea birds, 65,000 sea turtles and contaminated their habitats. Tourism and seafood were adversely impacted. About 2,100km of coast was covered in oil. Clean-up cost BP US$63.4bn.

These events are NOT rare. In November this year, the US Coast Guard reported an oil spill of 1 million gallons from the pipeline of Main Pass Oil Gathering Company.

Clean Ocean Foundation believes this application should be rejected because the likelihood and consequences of oil spills in the Otway Basin pose an unacceptable risk.

Consideration of the flow-on impacts needs to be reassessed, with identification and assessment of the risks, impacts and consequences for-

a. The local region overall – communities, businesses, livelihoods, and jobs,

b. The social costs associated with such impacts and consequences.

c. Fishing and tourism in the short and long term need to be assessed.

The Clean Ocean Foundation regards the risk from noise pollution as very high.

> *The physical presence of the survey vessels and towed acoustic equipment has the potential to result in the following effects on environmental receptors, including those that are recognised as key sensitivities within protected areas that overlap and* ***within*** *the OA.*

1. *Disruption to normal animal behaviours;*
2. ***Catastrophic damage to the plankton-based ecosystem,***
3. *Displacement of animals from preferred,* ***plankton-rich*** *habitat: and*
4. *Collision with* ***ships*** *or entanglement of animals in towed equipment.*

The Clean Ocean Foundation requires ConocoPhillips to state accurately the risks of seismic surveys to the marine ecosystem within the OA.

Risk Mitigation

The risk mitigation relies on marine mammal observers, passive sonar, and aerial surveys. These measures are inadequate and ineffective.

Observers can only see mammals on the surface out to 3.5km in good daylight conditions. Good visibility is rare in the proposed survey area, with common high wind and sea states, reducing the visibility of Marine Fauna Observers. Observers cannot see at night, and therefore any whales within the Observation and Shut Down zones will not be observed, resulting in an unacceptable risk of acoustic and strike injuries to whales within these zones. Observers cannot see 360 degrees, with vision impaired by structures on the ship (even when working from the bridge). A single observer monitoring throughout daylight hours is an ineffective technique to monitor for marine mammals (Annie Ford, Personal Communication). Furthermore, whales are primarily below the sea surface, with cryptic species rarely surfacing, particularly when disturbed. The danger zone is out to at least 10.2km. The farther from the ship, the greater the number of whales exposed to damaging noise pollution because of the area involved. (This is only the surface area – square of distance. We cannot estimate the significant water volume affected.)

The Clean Ocean Foundation requests acquisition occurs during daylight hours only, with two Marine Fauna Observers actively observing on the acquisition vessel at any one time. Additionally, three support vessels with two Marine Fauna Observers are required to adequately monitor the Observation zone out to 5 km or greater (a support vessel either side of the source, and a support vessel ahead of the source).

Aerial surveys are intermittent and restricted to good weather.

The Clean Ocean Foundation requests further information on the location of the base airfield, the frequency and duration of flights, and how aircraft to ship communication will work.

Passive Acoustic Monitoring (PAM) only works when whales are communicating and is ineffective at determining the range and bearing of animals. Whales often go for over 20 minutes without calling. Seismic blasts themselves can silence whales. As a means of locating whales in the danger zone, PAM is an unreliable and inadequate form of impact mitigation.

Recently, a whistleblower confirmed what has been long suspected. There was no place on the ship from which she could monitor all sides. The whistleblower spotted hammerhead sharks, whale sharks, dolphins and turtles but the ship was not required to halt the blasting except in some instances. The ship continued blasting through the hours of darkness without observers. "There's so much money involved in this. They will not give up a day," the whistleblower said.

ConocoPhillips says in its risk management plan that it will continue operations during darkness. ConocoPhillips is dissembling. To offer the above measures in mitigation and then to say that it will continue operations during darkness is untenable sophistry. How can the observers see the whales at night, especially at 3-kilometre ranges?

Even when observers are on board and well intentioned, the group pressure on that individual would most often result in a lower level of monitoring, as that person will be overpowered by the dominant determination of the ship's leadership and crew for whom the priority will invariably be directed to "getting the job done".

The rejected control measures on the bases of ALARP are presented without data. Either ConocoPhillips presents data on its anticipated profits and costs for mitigation, or it accepts the mitigation measures. Otherwise, ConocoPhillips is placing profits above environmental protection. Gas is a taxpayer-subsidised, highly profitable industry. At risk from such a vandalistic approach is the industry's social licence.

The Clean Ocean Foundation believes that if ConocoPhillips believes its previous activities have not harmed the environment, it should fund independent before and after assessments.

The Clean Ocean Foundation calls on ConocoPhillips to fund independent before and after assessments. Conducting the seismic surveys during the peak Pygmy Blue Whale season demonstrates profit over conservation. These whales are present in the OA. Other species, such as Bluefin Tuna and Sooty Shearwaters are present in the peak season too.

The Clean Ocean Foundation requests NOPSEMA to reject seismic surveys during the months when Sooty Shearwaters, Blue Fin Tuna, Pygmy Blue Whales or Southern Right Whales are present.

The residual risks are inconsistent with the scientific evaluation presented above and are considerably understated.

The Clean Ocean Foundation asks ConocoPhillips to revise the residual risks in the light of accurate scientific evaluation.

The noise criteria and sound levels use old papers which have been superseded by newer ones, such as McCauley et al.[23], (plankton), McCauley et al.[22] (crayfish). Some text is inaccurate and out of date. Please see our evaluation above and conduct a new literature review.

The Clean Ocean Foundation asks ConocoPhillips to bring the EP up to date.

Please revise in the light of our critique of the JASCO model and any draft National Guidelines.

Acoustic Disturbance Impact and Risk Summary.

Using bias in choice of papers, their interpretation and obscuration, ConocoPhillips assesses the risks as moderate which become acceptable with mitigation. Hogwash! As our critique of the evidence demonstrates, the risks are very high and the mitigation measures ineffective.

The application does not state ConocoPhillips appetite for risk. For instance, it is not clear what risks to the environment the company is prepared to run before the reputational risk for ConocoPhillips becomes unacceptable.

The Clean Ocean Foundation asks ConocoPhillips to provide a copy of its organisational risk management plan approved at board level and outline how the risks in this application link back to the overall company's risk management plan.

The Clean Ocean Foundation asks ConocoPhillips to rewrite the Risk Management Plan to an acceptable scientific standard.

Once ships are undertaking seismic surveys, how can ConocoPhillips know that there will be compliance with the risk management plan and if deviations have occurred? What periodic reporting of risk to NOPSEMA will occur? When would NOPSEMA revoke permission to operate?

The Clean Ocean Foundation asks ConocoPhillips to describe in a table how adherence to the Risk Management Plan may be independently verified, e.g. by NOPSEMA. Please provide further information on oversight, audit, compliance and consequences, and the frequency of these activities.

The Clean Ocean Foundation requests NOPSEMA to require ConocoPhillips to mitigate risks with the best environmental options available not the cheapest ones proposed.

The Clean Ocean Foundation notes that NOPSEMA does not regard the detection and control measures provided in the EP as acceptable (Freedom of Information Order of 8th March 2023 (164) relating to the National Offshore Petroleum Safety and Environmental Management Authority – Otway Basin – Inspection Report: 2023-000755, https://www.aph.gov.au/parliamentary business/tabled documents/1715.)

6. Conclusion

The Environment Plan submitted by ConocoPhillips is a deficient, inaccurate evaluation of the mounting scientific evidence about the destruction caused by seismic surveys. The Risk Management Plan and risk mitigation are not fit for purpose. An application of this length requires more than 30 days to evaluate it.

In summary, the Clean Ocean Foundation contends that the EP should not be accepted by NOPSEMA in its current form because:

•ConocoPhillips has not adequately defined its exact area of operations, and therefore not accurately evaluated impacts and risks;

• ConocoPhillips has not demonstrated that the impacts and risks are of an acceptable level;

• ConocoPhillips has not adequately demonstrated that the impacts and risks will be reduced to as low as reasonably practicable.

If ConocoPhillips is permitted to resubmit its EP, we would ask that each of our questions and points be addressed in a document that outlines where the Clean Ocean Foundation can find these changes in the application.

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