

Tamarind development drilling applications

Submission Reference no: 147

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Submitter Type: Individual

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Clause

Do you have the authority to make this submission on behalf of the person named on this form?

Position

Yes

Notes

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Do you intend to have a spokesperson who will act on your behalf (e.g. a lawyer or professional advisor)?

Position

No

Notes

Clause

Do you wish to speak to your submission at the hearing?

Position

Yes I/we wish to speak to my/our submission at the hearing

Notes

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Do you wish to receive regular updates from the EPA about the progress of this application?

Position

Yes I/we wish to receive all communications relating to this application.

Notes

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What decision do you want the Board to make and why? Provide reasons in the box below.

Position

Refuse

Notes

See attachment for full submission

Tamarind Taranaki Limited 2018 Applications for Marine Consent and Marine Discharge Consent

Submission to the Board of Inquiry of the Environmental Protection Authority

by Lyndon DeVantier, PhD

18TH June 2018

Introduction and decision sought

1. I request EPA to refuse the application for a broad range of reasons relating to various sections of the EEZ-CS Act (including but not limited to EEZ Act 2012 s10 (2), s34(2) and s34(4), s39(1)(d) and s39(3)(b), s59(2)(a) and s59(2)(i), s61(2) and s61(5), and particularly with regard to NZ's international obligations under UNCLOS 1982, UNCBD 1992, Noumea Convention 1986, London Convention on Dumping and the Paris Agreement 2016. In this submission I focus on the precautionary principle and cumulative effects, as per s6 (Meaning), s28 (Regulations), s33 (Matters).

Cumulative impacts in a global cetacean hotspot

2. Article 8 of the UNCBD requires the following of Parties, including New Zealand (which signed and ratified the Convention in 1992 and 1993):

- Article 8(d) Promote the protection of ecosystems, natural habitats and the **maintenance of viable populations of species in natural surroundings;**
- Article 8(f) Rehabilitate and restore degraded ecosystems and **promote the recovery of threatened species,...**

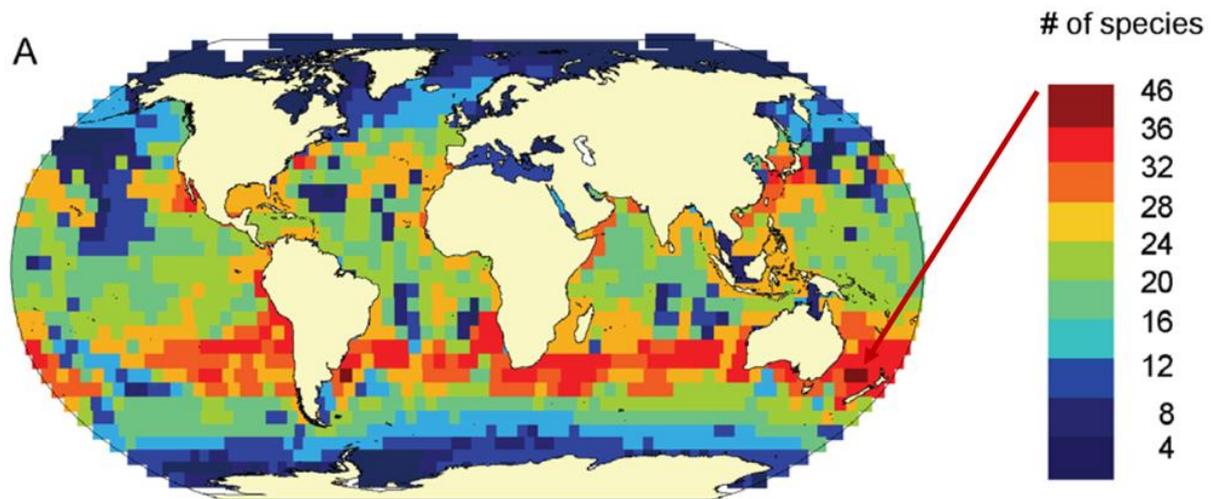
3. South Taranaki Bight (STB) is a global hotspot for cetaceans. According to Kaschner et al. (2011), STB and adjacent waters host the highest cetacean diversity on Earth, along with an area off western South America (their Figure 4A, reproduced here, <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0019653>).

4. Why is STB so important? High productivity, evidenced by krill *Nyctiphanes australis*. Krill populations, and those of their predators, shift seasonally, related to upwelling off Farewell Spit, sea temperature and presence of phytoplankton (Foster and Battaerd 1985, Bradford and Chapman 1988, James and Wilkinson 1988 among others).

5. What is known about these cetacean species in STB waters, or globally for that matter? Do we have enough information about their biology, ecology, including feeding, breeding and migration patterns, to be certain, or even confident, that allowing yet more industrial activity over a decadal time period will be benign?

6. According to the IUCN Red List, six species are Endangered and one is Vulnerable (Table 1). A further 18 species are Data Deficient on the IUCN Red List, meaning there is not enough known about them by the leading specialists globally, or indeed nationally (Table 1), to enable a robust assessment.

7. Furthermore, there are few if any reliable data on population sizes of cetaceans in STB prior to industrialization on which to make useful comparisons, although we do know that the Maui dolphin population had crashed across its range, which includes STB.



Kaschner et al. (2011) Figure 4. Validation with empirically observed marine mammal occurrences (56x56 cells, 1990–1999). A. Predicted species richness of all cetaceans.

8. Surely having six endangered species, one vulnerable species and another 18 species that are data deficient is cause for concern, and a powerful reason for adopting a cautionary approach. The lack of quantitative data, and of predictive analyses of habitat marginality and population viability, is a very poor reflection on fulfilling our commitment to meeting international obligations under the UNCBD.

9. To this purpose, there are several quantitative and semi-quantitative approaches that should have been employed. These include modelling future projections of changing sea temperature, acidification and productivity based on present conditions and various NIWA and/or IPCC scenarios. This approach can examine future habitat marginality, and when coupled with population viability analyses (PVA) could provide important insights into future cumulative effects in STB on threatened species. Such an approach was recommended by Angliss et al. (2002), who proposed a general framework for recovery criteria of large whales that should:

be applied at the Distinct Population Segment (DPS) level (eg. STB for Pygmy Blue Whales);

be defined by the risk of extinction (Endangered);

be probabilistic;

use a Population Viability Analysis approach/philosophy;

and explicitly identify the acceptable risk and the time frame of consideration.

10. As far as I am aware, this has not been done for any of the threatened large whales in STB, although PVA has been used to assess population trends in Hector's Dolphin in the South Island (Slooten et al. 2000), and a risk assessment has been undertaken for Maui dolphin (Currey et al. 2012). PVA, combined with power analysis, was also used by Thomson et al. (2001) to assess a small, isolated population of Bottlenose Dolphins in Scotland, and demonstrated that:

“... this approach can be used to provide a more scientific basis for determining the level of precaution required to address particular management issues in this and other marine systems.”

Table 1. Species identified from South Taranaki Bight region on IUCN Red List and NZ national list (in parentheses where different from IUCN). DD: Data Deficient; LC: Least Concern; Vu: Vulnerable; En: Endangered. * 3 spp. Nationally Critical (NC), ** 2 spp. Nat. Endangered (NE), *** 1 sp. Nat. Vulnerable (NV), NT – Not Threatened.

- Note: The “foraging population” of blue whales that was “thought to exist off the Taranaki coast” (Impact Assessment table 4.6) has been proved to be a genetically distinct population (Barlow et al. 2018).

Species	IUCN Red List / NZ (if different)	Species	IUCN Red List / NZ (if different)
Antarctic Minke Whale	DD (NT)	Risso’s Dolphin	LC
Common Minke Whale	LC	Short-finned Pilot Whale	DD
Southern Right Whale	LC (NV) ***	Long-finned Pilot Whale	DD (NT)
Bryde’s Whale	DD (NC) *	Spectacled Porpoise	DD
Sei Whale	En	False Killer Whale	DD (NT)
Humpback Whale	LC	Killer Whale	DD (NC) *
Fin Whale	En	Pygmy Sperm Whale	DD (NT)
Blue Whale 1	En	Southern Bottlenose Whale	LC (DD)
Pygmy Blue Whale (subspecies)	En	Hector’s Beaked Whale	DD
Hector’s Dolphin	En (NE) **	Shepherd’s Beaked Whale	DD
Maui’s Dolphin (subspecies)	En (NC) *	Cuvier’s Beaked Whale	LC (DD)
Dusky Dolphin	DD	Ginkgo Toothed Beaked Whale	DD
Pan Tropical spotted Dolphin	LC	Gray’s Beaked Whale	DD (NT)
Indo-Pacific Bottlenose Dolphin	DD	Arnoux’s Beaked Whale	DD
Common Bottlenose Dolphin	LC (NE) **	Andrew’s Beaked Whale	DD
Striped Dolphin	LC	Strap-toothed Whale	DD
Southern Right Whale Dolphin	DD (NT)	Sperm Whale	Vu (NT)

11. Why have such studies not been undertaken when they have been demonstrated to yield highly relevant information for management decisions when dealing with threatened species? Surely more studies like those of Prof. Slooten on Hector's Dolphins (2000) and Dr. Torres and colleagues on Blue Whales (2013, 2017, 2018) in STB should be initiated. This is a global hotspot after all.

12. To date, assessments of cumulative effects for the various notified applications that have been consented under the EEZ-CS Act for STB have focused principally on those of the application at hand, not on the overall impact, including synergisms, of adding that application to those already occurring and predicted to occur in STB.

13. This is contrary to the purpose of the Act, which states (my highlighting in bold):

s6. Meaning of effect

(1) In this Act, unless the context otherwise requires, *effect* includes—

- (a) any positive or adverse effect; and
- (b) any temporary or permanent effect; and
- (c) any past, present, or **future** effect; and
- (d) any cumulative effect that arises **over time or in combination** with other effects; and
- (e) any potential effect of high probability; and
- (f) any potential effect of low probability that has a high potential impact.

(2) Subsection (1)(a) to (d) apply regardless of the scale, intensity, duration, or frequency of the effect.

And

s33. Matters to be considered ...

(3) The Minister must take into account—

- (a) any effects on the environment or existing interests of allowing an activity with or without a marine consent, including—
 - (i) **cumulative effects**; and ...
 - (ii) the **effects of activities that are not regulated under this Act**; and
- (d) the importance of **protecting the biological diversity and integrity of marine species, ecosystems, and processes**;
- (e) the importance of **protecting rare and vulnerable ecosystems and the habitats of threatened species**; and
- (f) **New Zealand's international obligations**; and
- (i) the nature and effect of other marine management regimes; ...

And

s28 Regulations classifying areas of exclusive economic zone or continental shelf

(1) Regulations made under [section 27](#) or [29A](#) may identify and provide for areas of the exclusive economic zone or the continental shelf that—

- (a) are important or **especially vulnerable because of their biophysical characteristics**; or
- (b) are important for specific uses; or
- (c) must be managed in co-ordination with other marine management regimes; or
- (d) are, or are likely to be, the subject of competition or **conflict arising from the incompatibility of different activities**; or
- (e) are experiencing, or likely to experience, **cumulative adverse environmental** effects.

(2) The regulations may close an area of the exclusive economic zone or the continental shelf to all or any activities described in [section 20](#) or [subpart 2](#) of Part 2. (Excludes ‘permitted activities’)

Whales in the Bight and an elephant in the room

14. The EEZ-CS Act, in its present form, explicitly excludes consideration of the effects of an activity on climate change, surely a pertinent example of that famous old quote comparing laws and asses. This benighted foolishness notwithstanding, as noted above, anthropogenic climate disruption to the EEZ, including STB, should be considered under the Act as a major and growing cumulative effect. Our oceans are changing fast, with cascading effects through food webs.

15. As Hoegh-Guldberg and Bruno (2010) stated: “... *rapidly rising greenhouse gas concentrations are driving ocean systems toward conditions not seen for millions of years, with an associated risk of fundamental and irreversible ecological transformation. The impacts ... so far include decreased ocean productivity, altered food web dynamics, reduced abundance of habitat-forming species, shifting species distributions, and a greater incidence of disease. ... create enormous challenges and costs for societies worldwide ...*”

16. STB is globally important for cetaceans in large part because of its productivity, evidenced for the baleen whales by the occurrence of krill *Nyctiphanes australis*. Krill populations, and hence those of their predators, shift seasonally throughout STB, related to upwelling, sea temperature and presence of phytoplankton (Bradford and Chapman 1988, James and Wilkinson 1988 among others).

17. Krill are at significant risk from increasing sea temperature (Johnson et al. 2011):

“Reduced nutrient availability in warm years leads to reduced production and a shift to smaller phytoplankton species, resulting in a drastic reduction in the biomass of larger zooplankton, especially krill (Nyctiphanes australis).”

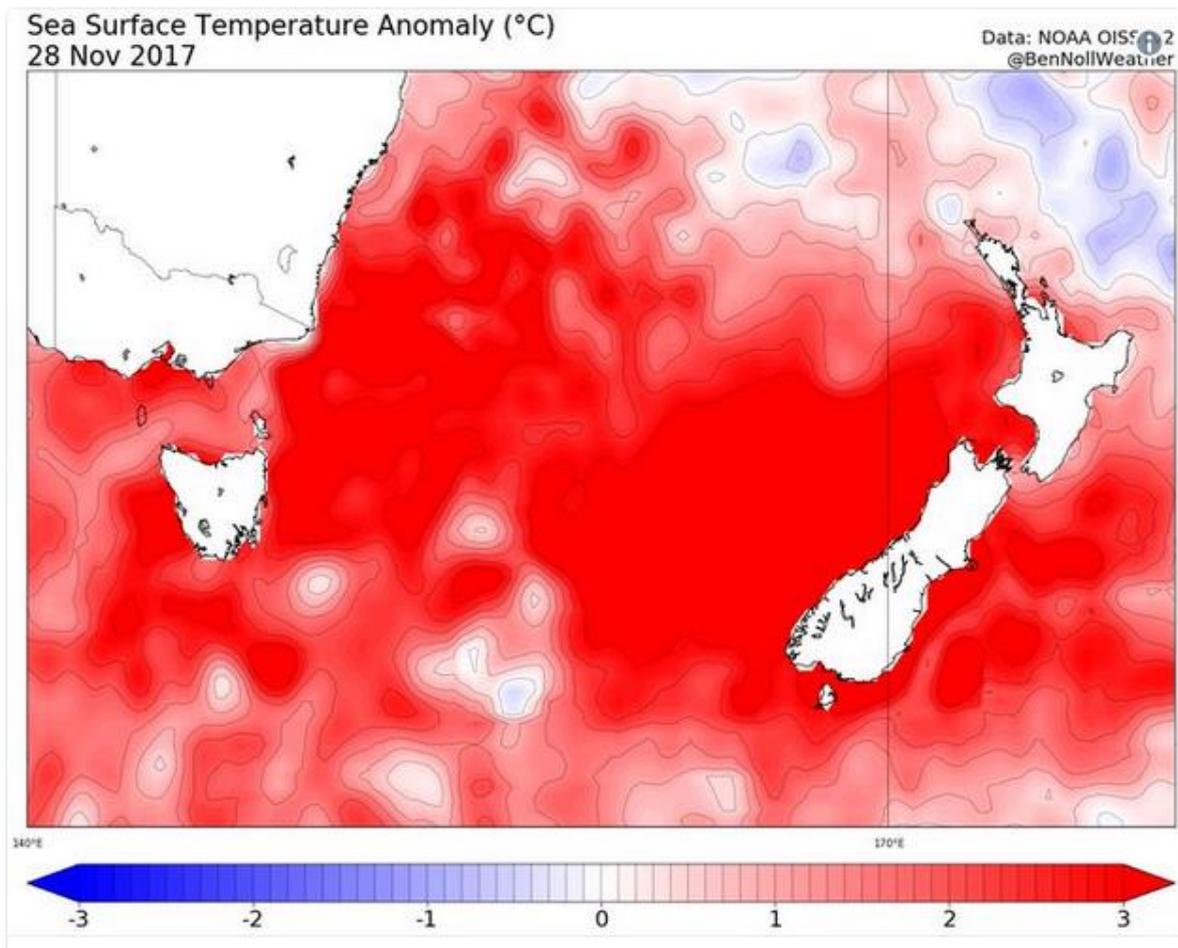
18. And Ocean Acidification (eg. Kawaguchi et al. 2013):

“Unless CO₂ emissions are mitigated, the Southern Ocean krill population could collapse by 2300 with dire consequences for the entire ecosystem.”

19. And indeed from seismic surveys (McCauley et al. 2017).

20. Climate disruption, along with all the other cumulative effects, will increasingly impact this oceanographic setting, the food chains on which it is built and the trophic cascades that will follow, although I was unable to find any published work specific to STB, another apparent research gap.

21. Three summers of record heating in the Tasman Sea from 2015 have likely already had cascading effects through the food web, and impacted cetaceans.



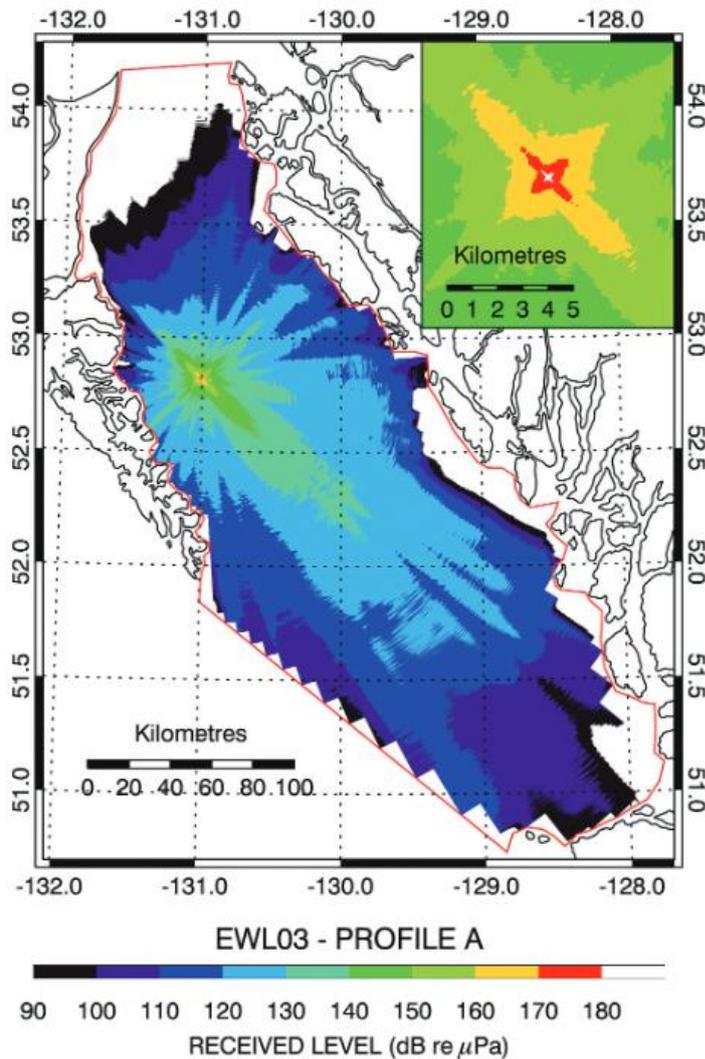
NOAA ‘Snapshot’ of extreme heating of Tasman Sea in November of 2017.

22. Case in point: In May-June of 2018, at least 13 sperm whales, most if not all males, died at sea in the area, from presently unknown causes. Record heating of the Tasman Sea and months of seismic blasting from the Amazon Warrior in the preceding summer, along with other industrial activities, are obviously not conducive to a harmonious environment for these threatened whales. It is likely they were under significant physiological stress which may well have contributed to their deaths.

23. Obviously I am speculating here. Why? Because the relevant studies, as outlined above, have not been done. The Department of Conservation (DoC) claimed, in the ‘Stuff’ media, that it was extremely unlikely that the seismic blasting caused their deaths (<https://www.stuff.co.nz/national/104292673/extremely-unlikely-seismic-surveying-linked-to-death-of-12-sperm-whales>), but this is not known for a fact. Indeed, it may well have contributed to them, along with the exceedingly high sea temperature and related probable disruption of food webs, all part of the cumulative effects of human activities locally, regionally and globally.

24. There is a large and growing body of peer-reviewed science that has demonstrated harm from seismic blasting to cetaceans (eg. Tyack 2008, Clark et al. 2009, Di Iorio and Clark 2009, Castellote et al. 2012). Intense noise from blasting travels for large distances underwater, as illustrated below.

25. Sperm whales dive to significant depths for extended periods, and hence may not have been sighted by the observers on board the Amazon Warrior.



Gisiner (2016) <http://acousticstoday.org/wp-content/uploads/2016/12/Seismic-Surveys.pdf>

26. It is precisely such circumstances, where cause(s) of death are unknown, which require a precautionary approach, in order to honour NZ's obligations to the UNCBD and the Rio Declaration on Environment and Development 1992 (CBD, 2012).

The precautionary approach to cumulative effects

27. "Where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat," as stated in the preamble of the UNCBD.

28. Such an approach would analyse the implications of allowing the current applications, focusing on the cumulative impacts on the recovery of endangered marine mammals and other species that would result from Tamarind's activities in combination with all the existing and anticipated impacts

of fishing, seismic testing, exploratory drilling, contaminant discharges, seabed mining and shipping, all occurring in a rapidly changing oceanographic regime.

29. As introduced above, the oceanographic, biological and ecological conditions that support the globally important diversity of cetaceans and other threatened species in STB are not static, to which additional impacts can be added incrementally. Rather, these are changing in response to climate disruption and ocean acidification, and because of the commitment humans have already locked into the climate system, will continue to do so for centuries to millennia. This is unquestionably a highly significant future cumulative effect that can, and should, be modelled.

30. I think it is incumbent upon the Board of Inquiry (BoI) to consider this carefully in the present and all future applications under this Act. Such consideration should include the commissioning of appropriate research.

31. Notably, over the past decade central government has allocated millions of taxpayer's dollars to the search for minable deposits of the fossil fuel methane clathrate, which simply cannot be burnt if we are to meet our international obligations. This money would have been far better spent on dedicated research on the changing oceanography and implications for food webs, fisheries and population viability of threatened species in STB and elsewhere in NZ's EEZ.

32. In my view, none of the mining applications under the Act to date have provided sufficient information to adequately address the criteria listed in the Act (s6, s28, s33) relevant to cumulative effects. Yet, despite that demonstrable failing, these are always considered to be low or negligible, a particularly sanguine finding consistent across all applications in STB under the EEZ-CS Act.

33. Independent cetacean specialists did not agree with the various prior assessments, and raised serious concerns in respect of the previous applications.

For example: *"Prolonged or repeated stress can increase susceptibility to other threats and impair immune function (e.g. Wright et al. 2011). ... Coastal species, like Maui dolphins are especially vulnerable due to the concentration of human activity ... Maui dolphins are already subject to a host of synergistic and potentially cumulative stressors that may be further aggravated by the effects of noise and other impacts associated with marine mining (Forney et al. 2017)."*

Quote from Prof. Liz Slooten's expert evidence for KASM in the TTRL seabed mining hearing, 24/1/16

34. And Torres et al. (2017): *"Cumulative and isolated impacts on blue whales and their habitat from these activities should be carefully considered by environmental managers. In particular, elevated anthropogenic ocean noise may disturb blue whale behavior and physiology, with consequences for individual health and population viability."*

35. This begs the obvious question: how many 'low or negligible impacts' does it take to make a moderate or major impact? Or: how many industrial activities can be squeezed into STB with 'negligible impact' in a rapidly changing oceanographic regime? 'Having cakes and eating them' comes to mind.

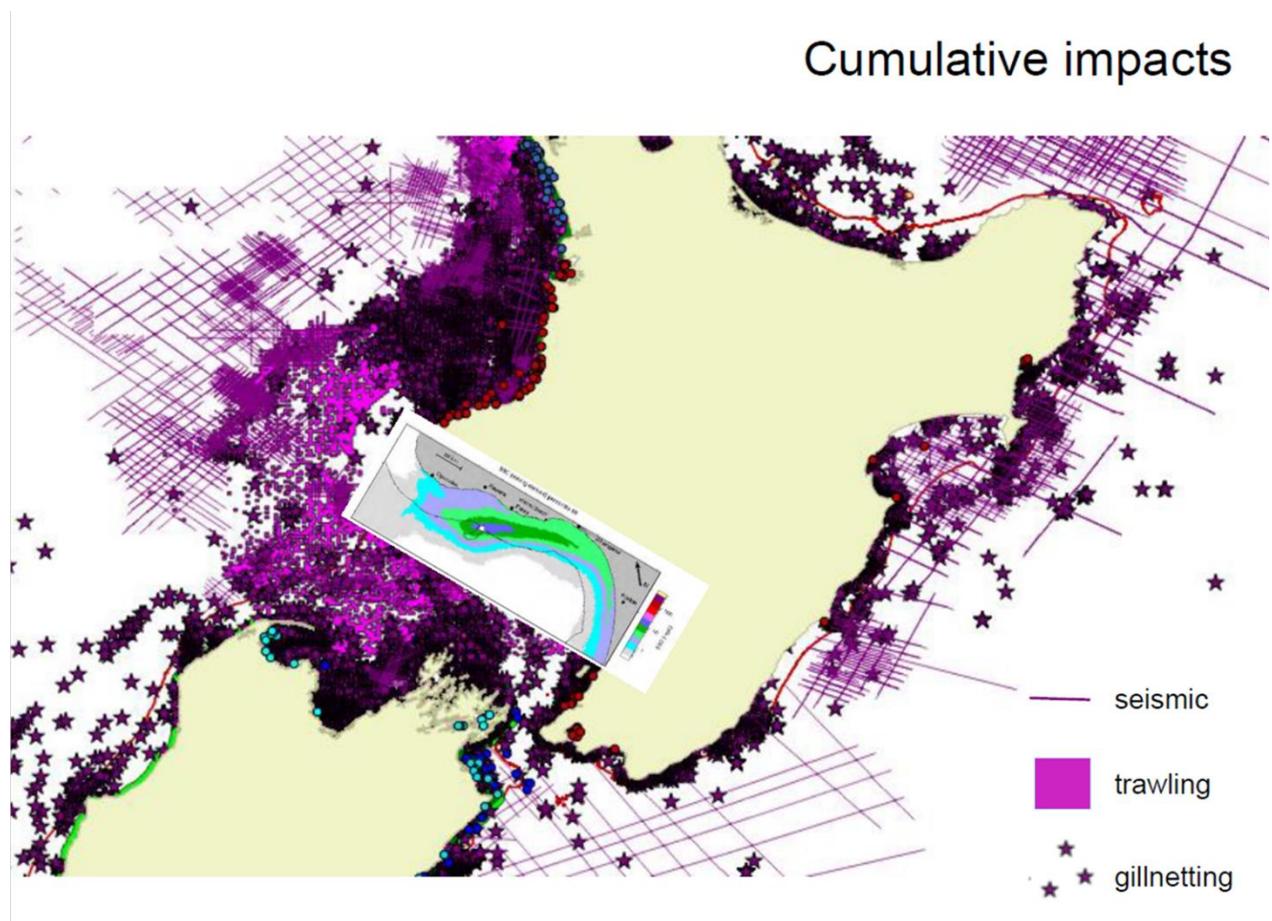
36. Other mining activities in the area include a drilling campaign by STOS permitted under the EEZ Act in 2015 (now operated by STL). Its proposed duration is 30-150 days per well or longer, and includes the drilling of 22 side-track wells. In total this could take up to 6 years. The impacts from the additional 7-9 months of noise and disturbance resulting from Tamarind's proposed activities, likely focussed in the summer-autumn months, need to be assessed together with the impacts from STL's approved activities, and also the anticipated drilling and discharge activities to be conducted by

OMV across six petroleum licensed areas from the North to the South Taranaki Bight in the coming six years. The TTRL seabed mining application is another case in point.

A Sacrificial Zone

37. STB is heavily industrialized, with fisheries, fossil fuel exploration and mining, and with sea bed sand-mining now consented (presently under appeal with High Court decision pending). This level of activity was well illustrated by Prof. Slooten in her graphic to the TTRL hearing (also see Torres et al. 2017).

38. Given all these activities, in my view the regulatory approach to the ecosystems and threatened species of STB is more akin to a sacrificial zone than a globally significant 'hotspot' for marine mammals, and other threatened species.



Reproduced from Prof. Slooten's evidence to TTRL hearing.

39. Both Prof. Slooten and Dr. Torres have now warned repeatedly against increasing industrial activity in STB. These independent scientists, acknowledged world experts, have nothing to gain from this, other than maintaining their professional integrity in stating the case for caution.

A false economy

40. NZ's Chief Scientist Sir Peter Gluckman (2013) pointed out: *"For New Zealand, the resulting impact of changes in wind patterns, precipitation, and the chemistry of our oceans can be expected to be at least as significant as the changes in temperature itself."*

41. More than a decade ago, back in 2007, the American Association for the Advancement of Science stated: *“The scientific evidence is clear Accumulating data from across the globe reveal a wide array of effects: rapidly melting glaciers, destabilization of major ice sheets, increases in extreme weather, rising sea level, shifts in species ranges, and more. The pace of change and the evidence of harm have increased markedly over the last five years. ... Delaying action ... will increase the environmental and societal consequences as well as the costs. The longer we wait ..., the harder and more expensive the task will be.”*

42. It is well past time that these valid concerns, becoming ever more urgent, are acted upon.

Lyndon DeVantier, PhD

18th June 2018.

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