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Tasmanian Government

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Committee Secretary
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The Tasmanian Government's Submission for the inquiry on the impact of seismic testing on fisheries and the marine environment

Thank you for the opportunity to contribute to this inquiry. Commercial fisheries are of particular importance to the Tasmanian economy and I am pleased to provide the Tasmanian Government's contribution.

The Institute for Marine and Antarctic Studies (IMAS) at the University of Tasmania has undertaken a number of studies on the impact of seismic surveys on the marine environment with a focus on rock lobster, scallops and plankton. Findings of these studies are summarised in Attachment A.

Should you require further detail, please contact this office and we will gladly put you in contact with the appropriate expertise.

We look forward to reviewing the outcomes of this inquiry.

Yours sincerely

[redacted]

Hon Guy Barnett MP
Minister for Primary Industries and Water

Attachment A

Seismic survey activity in Tasmania

To date, seismic survey activity in Tasmania has primarily covered the offshore waters of the West and North-West Coast and the North-East region. This principally impacts the Tasmanian giant crab fishery and the outer margins of the rock lobster fishery. The scale of the impact of seismic survey activity on these fisheries is currently unquantified. It is noted however that the giant crab fishery is considered particularly vulnerable.

The Institute for Marine and Antarctic Studies (IMAS) has undertaken a number of studies on the impact of seismic surveys on the marine environment focusing on rock lobster, scallops, and plankton. A summary of the findings of these studies as well as references are outlined below.

The 2016 study titled *Assessing the impact of marine seismic surveys on southeast Australian scallop and lobster fisheries*

Rock lobster

Using an industry standard seismic survey air gun, a range of sub-lethal effects were observed in rock lobster including:

- reduced ability for a rock lobster to maintain tail extension; and
- delayed righting response (time taken for lobsters to right themselves after being placed on their back).

Both of these effects are a measure of potential impairment of neurological control, which persisted for some time after exposure. This could possibly impact a lobster's ability to escape a predator.

On examining internal structures of the exposed lobsters it was found that the statocysts (a pair of fluid filled sacks found at the base of the antennules that are similar to the vestibular canal system in the human inner ear) exhibited significant damage in those lobsters exposed to the air gun treatment and was found to be permanent. Examination of haemocyte counts (used as an indication of health) found a reduction in cell counts following exposure. A decrease in haemocyte is typical of a response to trauma or stress and will leave the lobsters vulnerable to infection.

Scallops

For scallops, increased level of exposure (repeated exposure to air gun passes) resulted in an increased level of mortality with 60 per cent of scallops dying within 120 days of exposure, compared to 5 per cent of scallops dying that were not exposed. Examination of hemosites in exposed scallops found a significant reduction, likely resulting in the exposed scallops to be immunocompromised; one of the leading causes of mortality events in scallops.

A 2017 study assessed the impact of the use of marine seismic survey air gun operations on the zooplankton community (which contains the larval stages of many commercial fish species).

Plankton

Key findings of this study were:

- zooplankton abundance in the water column was lower after seismic air gun operations;
- localised zooplankton mortality was found to be significant, with the impact recorded at a distance of greater than 1 000m from the air gun; and

- The mean and median zooplankton abundance decreased by 89 per cent and 96 per cent respectively compared to control abundances of zooplankton.

Seismic survey activity has the potential to impact valuable commercial fisheries along with the ecologically important zooplankton community.

A typical seismic survey covers vast areas of ocean, ranging from a few hundred to thousands of square kilometres. Given the extensive spatial scale it is highly probable that depletion or modification of plankton community structure is occurring. This has potential ramifications for larval recruitment processes and higher order predators of zooplankton.

This is of concern to Tasmania where extensive seismic surveys have taken place to the west of Tasmania in the Otway and South Australian seismic survey regions. Larval stages of rock lobster drift in the zooplankton ecosystem for up to two years before settling on rocky reef. With the general west to east drift of lobster larvae seismic surveys in this region are likely to effect the survival of rock lobster larvae destined for Tasmania that originated in SA and western Victoria.

References

Day, R.D., McCauley, R. M., Fitzgibbon, Q.P., Hartmann, K., Semmens, J.M., Institute for Marine and Antarctic Studies, 2016, Assessing the impact of marine seismic surveys on southeast Australian scallop and lobster fisheries, University of Tasmania, Hobart, October. CC BY 3.0

Finkel, A. 2019. Independent Audit of NOPSEMA's Consideration of Exploration in the Great Australian Bight, https://www.industry.gov.au/sites/default/files/2019-09/independent-audit-of-nopsemas-consideration-of-exploration-in-the-great-australian-bight.pdf.

Mc Cauley, R.D. et al. Widely used marine seismic survey air gun operations negatively impact zooplankton. Nat. Ecol. Evol. 1, 0195 (2017).