

IN THE HIGH COURT OF NEW ZEALAND
WELLINGTON REGISTRY

I TE KŌTI MATUA O AOTEAROA
TE WHANGANUI-Ā-TARA ROHE

CIV-2021-485-676

UNDER THE	Judicial Review Procedure Act 2016
IN THE MATTER OF	An application for judicial review of decisions of the Minister for Oceans and Fisheries under s 13 of the Fisheries Act 1996
BETWEEN	THE ENVIRONMENTAL LAW INITIATIVE
	First Applicant
AND	CARMEN HETARAKA on behalf of TE URI O HIKIHIKI HAPŪ
	Second Applicant
AND	MINISTER FOR OCEANS AND FISHERIES
	First Respondent
AND	NEW ZEALAND ROCK LOBSTER INDUSTRY COUNCIL LTD
	Second Respondent
AND	NEW ZEALAND SPORTS FISHING COUNCIL INC
	Intervener
	[Continued...]

REPLY AFFIDAVIT OF VINCENT CARLYLE KERR
AFFIRMED 12th AUGUST 2022

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AND

ROYAL FOREST AND BIRD PROTECTION
SOCIETY INC

Intervener

AND

TE OHU KAIMOANA TRUSTEE LIMITED

Intervener

AFFIDAVIT OF VINCENT CARLYLE KERR

I, **Vincent Carlyle Kerr**, science advisor, of Whangārei solemnly and sincerely affirm:

Introduction

1. I am a principal of Kerr & Associates and engaged in environmental consulting with a focus on marine ecology monitoring, habitat mapping and marine protected area design and planning. I have previously affirmed an affidavit in this proceeding dated 6 May 2022.
2. I have been asked to read the affidavits filed in this proceeding by the Minister for Oceans and Fisheries (**Minister**) and the New Zealand Rock Lobster Industry Council (**RLIC**), and to comment on some of the matters raised in that evidence, as set out in this affidavit.
3. As set out in my first affidavit, I have read the Code of Conduct for expert witnesses in Schedule 4 of the High Court Rules and I agree to comply with it. Where this affidavit contains matters of expert opinion evidence, I confirm the statements made are within my area of expertise.
4. I have also read the reply affidavits of Associate Professor Nick Shears, Professor Andrew Jeffs and Dr John Booth. To the extent that their evidence is within my area of expertise, I confirm I agree with their opinions.

Dr Paul Breen

Extent of barrens in Northland

5. At paragraphs 40-49 of his affidavit, Dr Breen discusses the extent of urchin barrens in Northland by reference to my first affidavit and the surveys I referred to, as well as other surveys undertaken within CRA1.
6. At paragraphs 40, Dr Breen states "It is known that the hypothesis does not apply in sheltered nor very exposed locations, and not to the very shallow reef nor the deeper reef. The affidavit of Vincent Kerr shows that the barrens phenomenon affects only parts of the areas that were surveyed". In response, I say:
 - (a) As noted in my first affidavit, kina prefer an upper zone of the kelp forest, which is between 2 and 12 or 15 metres depth.¹ When predators are removed, variations in kina barrens will occur depending on whether the habitat in question is favourable to the proliferation of kina (including depth, wave exposure and the shape of the reef).² However, it is not correct as a general statement that urchin barrens do not occur in the areas listed by Dr Breen, namely sheltered and very exposed locations, very shallow reef, or deeper reef. I note that Dr Breen has not cited any evidence for his assertions that this is "known".³ Shallow reefs in low wave exposure areas with gentle slopes

¹ At [37(a)].

² At [32].

³ See also at [41].



and large smooth terrain are in fact more prone to the formation of kina barrens than any of the other habitats, as clearly demonstrated in the Bay of Island Cape Karikari Peninsula and Mimiwhangata.

- (b) The purpose of the studies I referred to in my first affidavit was not to test the trophic cascade hypothesis,⁴ but rather to estimate the extent of kina barren habitat for the entire exposed Northland east coast. The findings of that study show what is actually occurring on that coastline and relate to large areas of coast and ocean.
 - (c) Dr Breen is correct that, in some of the areas we surveyed, kina barrens did not occur. As stated above, the presence of kina barrens will depend on whether the local environment is favourable to kina. The absence of kina barrens in areas that are unfavourable to kina does not disprove the trophic cascade hypothesis.
7. At paragraph 42, Dr Breen refers to the findings of my 2017 study, noting that barrens in CRA1 occupy 25–40% of the rocky reef system “if the depth range is restricted to that in which barrens can occur”. That is incorrect. The “preferred kina habitat zone” which I referred to in my 2017 study and first affidavit is not the only area in which barrens can occur, but where they are more likely to occur given that kina prefer that habitat and kelp forest is more dense in that area.⁵
 8. At paragraph 43, Dr Breen refers to the 2005 habitat mapping I undertook with Dr Grace at Doubtless Bay.⁶ I do not understand how the figures of 5% and 22% that Dr Breen cites have been calculated, as these figures do not appear in our report.
 9. At paragraph 44, Dr Breen refers to the habitat mapping I undertook with Dr Grace in the proposed Waewaetorea Marine Reserve (on the western side of the Cape Brett Peninsula) in 2015.⁷ That study concluded:⁸

The high resolution of mapping in this study made it possible to accurately delineate kina barrens as part of the shallow rocky reef environment. This study indicates that the extent of kina barrens in sheltered areas is a concern, and now covers 43% of shallow rocky reef at this location. Kina barrens also cover 10.3% and 1% of moderately exposed and exposed reef habitats have respectively.
 10. As noted above, in the absence of predators, the occurrence and extent of kina barrens will depend on there being conditions favourable to kina. For that reason, the incidence of kina barrens was much lower in the moderately exposed and exposed parts of the coast (10.3% and 1% respectively) than within the shallow rocky reef (43%), which is more favourable to kina. This variation

⁴ At [32], [33] and [36].

⁵ At [37].

⁶ Grace, R., Kerr V. 2005. Intertidal and subtidal habitats of Doubtless Bay, Northland, N.Z. A report prepared for Department of Conservation, Northland Conservancy, Whangārei. 34 pp.

⁷ Kerr, V.C., Grace, R.V. 2015a. Marine habitats of the proposed Waewaetorea Marine Reserve. A report prepared for Fish Forever, Bay of Islands Maritime Park Inc. 54 pp.

⁸ At 6.

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was noted in the 2015 study.⁹ Dr Breen also states "the *Ecklonia* kelp cover in these three exposure types was 91%, 83% and 42% respectively". As above, I do not understand how these figures have been calculated as they do not appear in our report.

11. At paragraph 45, Dr Breen refers to the findings of a NIWA survey in the Bay of Islands. As explained by Dr Booth in his affidavit,¹⁰ the focus of the NIWA study was to describe the species present on shallow rocky reefs in the Bay of Islands, not to determine the extent of kina barrens in that area. It was a biodiversity study comprising a simple set of transects. As such, the results of Dr Booth's work, and that of myself and Dr Grace, whose purpose was to determine the extent of kina barrens, should be preferred in this context. It is entirely inappropriate to compare these two sets of data and observations. The methodology is different and scale of the two studies is vastly different, with the NIWA transects covering a few hundred metres of reef area, whereas the collective work of Dr Booth, Dr Grace and myself is spread across the entire Northland coast, and covers hundreds of hectares mapped as fine scales with direct evidence of high quality aerial photos tested with extensive field studies.
12. At paragraph 47, Dr Breen notes there is variation in barren coverage within CRA1. As noted above, this variation is likely due to the variation in localised conditions that make some areas more favourable to kina barrens than others once predators are removed. The purpose of the mapping work undertaken by myself and others is to study representative sites along the coastline in order to use the data to build a model from which we can extrapolate an estimate of what is happening for the entire coast.
13. At paragraph 48, Dr Breen states "Although the overall extent of sea urchin barrens coverage within CRA 1 is unknown, the various surveys suggest it is significant in some areas". I query what Dr Breen means by "unknown" in this context. We cannot achieve perfect knowledge in marine ecology. Instead, we undertake field work to obtain the best information we can, and try to understand the limitations of that information. In my view, the work undertaken by Dr Grace and I, surveying large areas of coastline within CRA1, goes a long way to getting a good picture of the extent of kina barrens on the northland coast.

Comments on my first affidavit

14. At paragraphs 50-57 of his affidavit, Dr Breen has commented on my first affidavit.
15. At paragraph 50, Dr Breen states that our work at Mimiwhangata cannot be considered "a hypothesis test". In the classical sense of a hypothesis test, Dr Breen is correct. We cannot establish a classical hypothesis test because an unfished environment has not existed since well before the 1950s; we cannot recreate that environment. The closest example we have to an unfished environment is research undertaken within the marine reserves, where kina barrens cover only 1% of the available marine reserve.¹¹ At Mimiwhangata, Dr Grace and I compared aerial imagery from the 1950s to modern aerial imagery, and analysed the results, in terms of the extent of kina barrens present, against

⁹ See, for example, at 22-25.

¹⁰ At [18].

¹¹ See my first affidavit at [34(b)].

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the known history of fishing of rock lobster in that area over the same period. The results of that process, along with what is known about the trophic dynamic, support a conclusion that fishing of rock lobster has been a significant factor in the creation and proliferation of kina barrens.

16. At paragraph 52, Dr Breen states that because storm damage, urchin and kelp disease outbreaks can locally damage kelp forests for some time, it is a logical leap to state that only predator depletion can cause kina barrens. However, kina barrens were not present in any of the aerial imagery we reviewed from 1950. In 1950, storm damage, urchin and kelp disease outbreaks existed, however no barrens were formed. Similarly, within the marine reserves these factors are at play, and yet there are no, or very low levels, of kina barrens. As above, we cannot conduct a classical hypothesis test, however the evidence we do have strongly supports the conclusion that predator depletion is the main driver leading to the creation and maintenance over time of kina barrens.
17. At paragraph 53.1, Dr Breen agrees that it is likely that there is much lower rock lobster biomass on the east coast of Northland than in CRA1 as a whole. However, given that the levels described in the stock assessment (and the resulting TAC options) apply to the entirety of CRA1, this means that the Minister's TAC decision does not take into account the low biomass levels on the east coast, and the effects of those levels.
18. At paragraph 53.2, Dr Breen has misrepresented Dr Booth's work.¹² Dr Breen is correct that there is low commercial rock lobster catch in the southern part of CRA1, however the important context here is why is this the case. Commercial fishing occurs when it is profitable; it is logical that in parts of the Northland East Coast the biomass crayfish is now so low that commercial fishing has become unviable. This situation suggests that the modelling information is not representing the actually biological status of the crayfish in these areas.
19. In response to Dr Breen's paragraphs 54 and 55:
 - (a) At paragraph 54 of my first affidavit, I was referring to recovery of the ecosystem, so in that respect I am referring to recovery of both rock lobster biomass and kelp beds, with the recovery of rock lobster biomass being a necessary precursor for the recovery of kelp beds.
 - (b) As set out in my first affidavit, my statement that only no-take areas or moratoriums would support recovery effectively was based on the findings of Dr Shears' 2006 paper,¹³ which compared recovery of rock lobster populations within a no-take reserve against a partial-take reserve. The findings showed that, once lobster biomass is at a low level, allowing even low levels of fishing "has little benefit to restoring populations of exploited species".¹⁴

¹² Reply affidavit of John Booth at [23].

¹³ Annexed to my first affidavit as VCK-4.

¹⁴ Cited at [42] of my first affidavit.

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20. At paragraph 57, Dr Breen refers to my evidence that:¹⁵


To the extent that the advice to the Minister stated that the science is controversial, hypothetical or equivocal, or that the matter is complex and the relationship between rock lobster abundance and urchin barrens is unknown, that advice is wrong.

21. Dr Breen's opinion is that that advice to the Minister was correct.¹⁶ In fact, I understand that Dr Breen himself drafted that part of the advice to the Minister.¹⁷
22. Dr Breen states that his opinion is based on his experience and published material. However, as Dr Breen states, he has undertaken no direct research relevant to trophic cascades in New Zealand,¹⁸ nor has he produced any published work in this area. Dr Breen's opinion conflicts with that of Associate Professor Shears, Dr Booth, and Dr McDiarmid, who have undertaken extensive field work and published work in this area.

Dr Stephen Wing

23. At paragraphs 46-48 of his affidavit, Professor Wing has commented on my first affidavit. Except as stated below, I agree with those comments.
24. At paragraph 48, Professor Wing notes that we lack a formal definition for "ecological extinction" upon which to base biological reference points in fisheries. This is correct. However, despite not having a formal definition for "ecological extinction", rock lobsters are ecologically extinct in CRA1 to the extent that they have lost their previous role as regulators of sea urchin populations.¹⁹ That is concerning from an ecological perspective, regardless of whether there is a formal definition.
25. At paragraph 48, Professor Wing comments that there is precedent in New Zealand for using a network of spatial management and bolstering spawning stock. However, neither of these measures are being undertaken in CRA1.

AFFIRMED by Vincent Carlyle Kerr)
at Whangārei this 12 day of)
August 2022 before me:)


Nicole Jayne Dore
Solicitor
Whangareai


Vincent Carlyle Kerr

- ¹⁵ At [55] of my first affidavit, in reference to the advice to the Minister on his 2021/22 CRA1 TAC decision.
- ¹⁶ Dr Breen affidavit at [14.11].
- ¹⁷ Annexure MLA-684 to the affidavit of Monique Andrew. See also MLA-645.
- ¹⁸ At [4.3].
- ¹⁹ See [46]-[48] of my first affidavit.

