IN THE HIGH COURT OF NEW ZEALAND
WELLINGTON REGISTRY

CIV-2023-485-541

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

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| **UNDER THE** | Judicial Review Procedure Act 2016 |
| **IN THE MATTER OF** | An application for judicial review of a decision of the Minister of Oceans and Fisheries under s 13 of the Fisheries Act 1996 |
| **BETWEEN** | **THE ENVIRONMENTAL LAW INITIATIVE** |
| | **First Applicant** |
| **AND** | **DALLAS WILLIAMS** on behalf of **Ngāti Hau & Ngāti Kaharau Hapū ki Hokianga** |
| | **Second Applicant** |
| **AND** | **MINISTER FOR OCEANS AND FISHERIES** |
| | **First Respondent** |

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**REPLY AFFIDAVIT OF VINCENT CARLYLE KERR**
**5 JULY 2024**

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| AND | **NEW ZEALAND ROCK LOBSTER INDUSTRY COUNCIL INC** |
| | **Second Respondent** |
| AND | **SEAFOOD NEW ZEALAND LTD** |
| | **Third Respondent** |

## REPLY AFFIDAVIT OF VINCENT CARLYLE KERR

I, Vincent Carlyle Kerr, of Whangārei, science advisor, 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 19 April 2024.

2. I have been asked to read the affidavits filed in this proceeding by the Minister for Oceans and Fisheries (**Minister**), the New Zealand Rock Lobster Industry Council (**RLIC**) and Seafood New Zealand Ltd (**SNZ**), 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, I confirm the statements made are within my area of expertise.

4. In this reply evidence, I will reply to issues raised and information introduced by Mr Bruce Hartill, Dr Jean Win, Mr Mark Edwards and Professor David Shiel. In areas where there has already been extensive evidence provided to the Court, I will only make brief comments in reply. There are, however, some specific matters raised in the affidavits which I will address in more detail.

### Implications of the differences within the CRA1 statistical areas

5. In my evidence, I stated in paragraphs 17 and 18 that in considering spiny rock lobster *Jasus edwardsii* (which I refer to as crayfish), my experience and, as a result, my evidence is focused on the east coast of the CRA 1 area. I am also familiar with the shallow habitats of the west coast and offered some comment on the extensive differences between these two ecological sub-regions of Northland, which are in different bioregions.

6. In paragraphs 32 and 33 of my evidence, I stated that due to the differences between the bioregions within CRA1, combining CPUE catch data from the whole of CRA1 will not derive outputs that are useful for managing the stock on the east coast. I presented ecological evidence of the risks faced by the east coast crayfish population and associated reef community if it continues to be managed at very low levels, which it has been for more than a decade.

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7. The evidence of Mr Bruce Hartill,[1] Dr Jean Win,[2] and Mr Mark Edwards[3] has added important information to this issue. They have provided specific information on crayfish fishers leaving the fishery, now down to 1-2 boats in 2022, and state that catch from the east coast zones (areas 903 and 904) has dropped to under 5% of the CRA1 total catch in 2023.

8. Dr Win in her evidence, offers a scientific summary of the situation in paragraph 75 (my emphasis added):

> "In particular, the information on the CRA1 fishery that informs the stock assessment model is collected from the fishery only (e.g., CPUE and size information sampled directly from the fishery). *In this respect, the retreat of commercial fishing from the east coast of CRA1 over the past 2-3 years means the stock assessment model cannot resolve fishery health in this area.* "

9. The information provided above confirms my earlier assertions that:

   a. the east coast of the CRA1 fishery has been fished to low levels; and

   b. as a result of this, the current stock model, while it may reflect useful information on the west coast and Three Kings Island, is not fit for purpose for determining the health of the east coast crayfish population.

10. In circumstances where the stock assessment model cannot give meaningful guidance on the health of the fishery in certain areas, data from diver-based abundance surveys becomes more relevant. The 2006 Mimiwhangata survey was designed to provide a long-term snapshot view of crayfish numbers in the Marine Park.[4] The 2006 paper achieves this and indicates that the crayfish population was at critically low levels and did not recover after commercial fishing ceased and non-commercial fishing continued. There is no question that the result in this paper is based on very limited sampling in a spatial sense and that its results could not be applied across of the whole of CRA1.[5] That said its results are helpful as a cautionary indicator on the state of the fishery in this area, particularly in the absence of other meaningful data and it outlines how further surveys in other areas could be undertaken going forward.

11. Another important factor affecting the east coast crayfish population is the impact of non-commercial fishing. If the commercial catch is reduced to zero or near zero,

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1 Affidavit of Bruce Hartill at paragraphs 42 and 61.

2 Affidavit of Dr Jean Win at paragraphs 75.

3 Affidavit of Mark Edwards at paragraphs 13 to 15.

4 Shears, N. T.; Grace, R.V., Usmar, N.R.; Kerr, V.; Babcock, R.C. (2006). Long-term trends in lobster populations in a partially protected vs. no-take Marine Park. Biological Conservation 132: 222-231.

5 As discussed by Mr Hartill at paragraphs 69 and 70 of his evidence.

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a significant non-commercial catch remains on the east coast. Mr Edwards summarises the available information for us in paragraph 18:

> "Recreational fishing in CRA 1 predominantly occurs on the east coast of Northland. Although information on the amount and distribution of recreational catch is relatively poor, the National Panel surveys (NPS) undertaken in 2011/12, 2017/18 and 2022/23 suggest that recreational catch from North Cape to Te Arai point (more or less equivalent to statistical areas 903 and 904) has been between 76% and 97% of recreational catch in CRA 1. Total estimated recreational catch in CRA 1 is estimated at 23.8 tonnes (2011/12), 15.5 tonnes (2017/18) and 8 tonnes (2022/23)".

12. This is a significant recreational catch level if these areas are in the precarious situation of very low crayfish biomass. Even modest levels of fishing creates a risk of curtailing restoration gains. Additionally there is risk of serious local depletion at the most popular, easy to access and high quality crayfish habitats which non-commercial fishers typically target.

**Issues relating to rock lobster ecology**

13. There has been considerable discussion of considerations of crayfish ecology. I have argued the urgent need for these fundamental ecological requirements to be included in stock modelling and taken into account in management decisions. In my reply, I want to make a few general comments in relation to the body of ecological criteria discussed in this case to date.

14. I acknowledge evidence provided by Mr Hartill in paragraph 79 that corrects a statement I made in paragraph 48 that "recruitment inputs to the stock model **appears** to be based on settlement data collected in CRA3...". Mr Hartill explained that this was incorrect and that the CRA1 model uses a CPUE-based metric based on pre-legal age class recruits as the model input. I accept this correction and appreciate having this clarified. That said, I note that Mr Hartill does not detail the limitations and strengths of this approach to the model input. More importantly however, if, given the retreat in commercial fishing from areas 903 and 904 the model data based on CPUE is not providing useful information on crayfish abundance in these areas, then by extension, a CPUE-based metric will also not be providing useful information on recruitment in these areas.

15. Ecologists can debate subtleties and varying opinions on the relevance of various ecological matters at length; the ocean is very big and very complex. We can also look at wide-ranging research efforts internationally. There is quite a bit of this sort

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of analysis and opinion offered by Professor Shiel in his evidence.[6] However, at some point, pragmatic action must be taken using the best available applicable research. General ecological theory and broad principles are helpful, but the most useful observation and knowledge come from work done in the region in question and with the species and the biologists involved in that work. In this regard, I wish to point to the authoritative and comprehensively referenced review of crayfish research completed by Dr. MacDiarmid and her colleagues on the body of crayfish ecology in Northeast New Zealand, which I discussed at paragraphs 42 to 46 of my affidavit.[7] In paragraph 44, I listed specific ecological criteria presented in the MacDiaramid paper that are arguably important and, in some cases, critically important as measures or characteristics of a sustainable crayfish population. These are not mere theoretical discussion points, opinions or observations. They are all practical descriptions and results based on fieldwork done in the region at issue.

16. I want to acknowledge Dr Win and her colleagues' work in assembling pertinent ecological information around crayfish ecology, trophic cascades and kelp forest recovery. The summation provided by Dr Win in her evidence establishes a science baseline accepted and understood by FNZ staff and decision-makers. This represents a shift in the Ministry in taking on board the ecological considerations of crayfish as a top predator, the significance of trophic cascades, the current loss of kelp forests and the consideration of restoration options. The test now is whether this progress can be translated into effective management action implemented promptly.

***Considerations of Spatial Closure***

17. In his evidence at paragraphs 40 and 41, Professor Shiel suggests that large-scale closures are not a preferred option and that finer-scale information would be needed to design and justify fit-for-purpose spatial closures. This evidence is at odds with the reality that FNZ are managing large areas, and the collection of the data he is implying would be needed is, in most cases, not practical or achievable. Professor Shiel comments at paragraph 37 of his evidence, after acknowledging the extensive work in our 2024 kelp forests extent paper,[8] that the

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[6] To take two examples, at paragraph 47 he refers to study from the coast of California about a different urchin and predator species, at paragraph 48 he refers to a study from Lord Howe Island in Australia again about a different urchin species.

[7] AB MacDiarmid, D Freeman & S Kelly (2013) Rock lobster biology and ecology: contributions to understanding through the Leigh Marine Laboratory' 1962-2012, *New Zealand Journal of Marine and Freshwater Research*, 47:3, 313-333.

[8] Kerr, V. C., Grace, R. V., & Shears, N. T. (2024). Estimating the extent of urchin barrens and kelp forest loss in northeastern Aotearoa, New Zealand. New Zealand *Journal of Marine and Freshwater Research*, 1–22. https://doi.org/10.1080/00288330.2024.2336081

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extrapolation of the mapped kina barren areas (14% of the Northland east coast) to create an estimate of regional scale loss needs validation. This is a fair comment from a scientific perspective and a good justification for the further mapping work now supported by FNZ. However, the research repeatedly points to a known loss of a large area of our most important shallow coastal habitat. The mapped areas of kina barrens are spread geographically across the east coast region. Professor Shiel does not comment on the implication of this finding and the need for urgent action to halt productivity and biodiversity decline resulting from existing barrens or new barrens forming.

18. Dr Win, in paragraph 95 of her evidence, responding to Associate Prof. Shears' evidence calling for significant spatial closures, states:

> "I note there is currently no known target for rock lobsters that will reduce the spread of or reverse kina barrens and the more region-specific measures required for the east coast of CRA1."

19. I want to present a pragmatic view of Dr Win's highlighted point. Unfortunately, she doesn't offer any detail on what sort of target this would be, how it could be determined, and how precise it would need to be. A specific target biomass figure would qualify as 'nice to know', but it is difficult to achieve. FNZ does not require a definite answer to this unknown in order to implement spatial closures of some form. This and similar questions were not answered empirically before our current no-take reserves were established.[9] In the marine reserves at Leigh and Tāwharanui, crayfish recovered well and achieved age structures we would describe as closer to a natural population, which is a crucial ecological characteristic of a sustainable crayfish community. These early reserves were created to allow natural recovery in the absence of fishing. Several decades later, in these reserves, we have recovered crayfish populations, and kina barrens restored to kelp forests. Spatial closures are an action that can be taken now based on the information we have available and does not require knowing a specific target biomass level.

20. Furthermore, the most effective way to determine the target biomass of crayfish required to reduce the spread of kina barrens would be to implement a series of no-take fishing areas in parts of the east coast CRA1, and then monitor the biomass of crayfish against any reduction of kina barrens compared to nearby fished areas. In taking this course of action, the urgency to reverse kelp forest loss is addressed, and monitoring the recovery process can shed light on the target biomass of crayfish for maintaining a healthy shallow reef community. FNZ

[9] For example, the no-take fishing areas implemented by the Northland Regional Council around the Bay of Islands, the s 186A closure around the Tutukaka harbour, and the longstanding marine reserves in Leigh and Tāwharanui.

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could also use existing data sets from no-take areas, such as the Leigh Marine Reserve and Tāwharanui, to determine a preliminary biomass target. A modelling exercise could be undertaken based on the time series data of crayfish biomass recovery and the reversal of kina barrens to kelp forest in these no-take reserves.

***Marine Protected Area Design Best Practice***

21. Mark Edwards, in paragraphs 19 to 28, makes several comments about the evidence supplied by myself and my colleagues Professor Jeffs and Associate Professor Shears that we were inconsistent in what we were proposing for spatial closures and that we failed to specify objectives, like the location, scale and number of closures needed. I was instructed that it was inappropriate in the context of a judicial review proceeding to state expressly what a Minister should have done or should do by way of specific closures. Instead, my evidence was aimed at explaining in general terms the relevant ecological-based actions that could address the recognised problem of crayfish decline on the east coast and kelp forest loss.

22. Regarding the process of creating spatial closures, I wish to point to my previously submitted evidence on the processes and principles of creating a network of fully protected areas. This information, along with additional evidence from past cases concerned with this topic, is presented in paragraph 62-65 of my evidence.

**Affirmed** by Vincent Caryle Kerr )
at Whangārei this 5 day of )
July 2024 before me: )

Vincent Carlye Kerr

A barrister/solicitor of the High Court

Charleen A Going
Solicitor of the High Court
Whangarei