

**BEFORE THE ENVIRONMENT COURT  
AUCKLAND REGISTRY**

**ENV 2016 AKL 000173**

**UNDER the Resource Management Act 1991**

**AND**

**IN THE MATTER of a declaration under Part 12 of the Act**

**BETWEEN THE TRUSTEES OF THE MOTITI ROHE MOANA TRUST**

**Applicant**

**AND BAY OF PLENTY REGIONAL COUNCIL**

**Respondent**

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**REPLY AFFIDAVIT OF DR ROGER VERNON GRACE IN SUPPORT OF DECLARATION (ON BEHALF OF  
MOTITI ROHE MOANA TRUST)**

**28<sup>th</sup> October 2016**

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*R. Enright*

*Roger Vernon Grace*

**I, Roger Vernon Grace of Auckland, marine biologist, swear:**

- 1 I am a marine biologist and have over 40 years experience in this field. **Annexure A** is a summary of my experience and qualifications as a marine biologist. My experience includes being involved in marine spatial planning and restoration work for the Hauraki Gulf.
- 2 This evidence is given on behalf of Motiti Rohe Moana Trust. I confirm that I have read the Code of Conduct for expert witnesses contained in the Court's Practice Note 2014 and that I agree to comply with the Code. I also confirm that I have not omitted to consider material facts known to me that might alter or detract from the opinions expressed in my evidence.
- 3 This affidavit is in response to affidavit evidence filed by Jo Noble sworn 11<sup>th</sup> October 2016. At [9], [10] and [14], Ms Noble states:

"[9] While the proposed declaration refers to controls on activities being for various purposes there has been little in the way of direct examples or evidence about those purposes that explains what is actually intended..

[10] By way of example: While the merits of the Applicant's appeal is not part of these proceedings, I have not seen evidence or reference to evidence explaining the need for the rāhui or any controls over the taking of indigenous flora or fauna that are additional to those already in the Proposed Regional Coastal Environment Plan or how these additional protections relate to the purposes stated in the application.



[14] So while there have been discussions on the issue of how and when a rāhui may be translated into regional planning documents, I do not consider that the current declaration really gets to the nub and addresses the questions about this, and neither does the evidence in the affidavits really explain it in a way that supports the use of rāhui for protecting indigenous biodiversity through planning rules other than in the manner set out in section 66."

- 4 My understanding is that the purpose of a rāhui is stated in the affidavit evidence provided by Kimberley Maxwell. Ms Maxwell's Annexure B is a paper entitled "*How the use of rāhui for protecting taonga has evolved over time*". That paper states:

"The purpose of rāhui

Literature sources indicate there were three original uses of rāhui. These are to claim ownership, following the loss of life and for replenishing resources. Currently, rāhui are used following the loss of life, to replenish resources and for religious purposes. (Maxwell, Annexure B, pp3)

- 5 Annexure C to Ms Maxwell's affidavit (Rāhui: A blunting of teeth) refers to the conservation function of rāhui, noting:

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“Traditionally, the first type, the conservation rāhui, was enforced to protect the fertility of terrestrial and marine resources such as berries, birds, fish, cultivated crops, fern root, flax or places where ochre was obtained (Best, 1904). A rāhui was initiated, for example, during the spawning season of certain kinds of seafood; when plant species, animals or fish exhibited signs of depletion; and when it was necessary to build up stocks for a special occasion..” (Maxwell, Annexure C, p43)

- 6 Based on Ms Maxwell’s affidavit material, my understanding is that where a rāhui is imposed for conservation purposes, or to replenish resources, then it has a similar effect to a “no-take” approach to marine life. To the extent that a rāhui operates like a “no-take” zone, then it may be limited to a specific area, season or time of year, all species, or a particular species of indigenous flora and fauna, such as a taonga species. Where the rāhui relates to an area, then this should be spatially identified, and the area should be of an adequate size to ensure that it provides viable protection for habitat. In short, a rāhui can maintain and protect biodiversity generally or an individual taonga species in particular.

#### **BIODIVERSITY BENEFITS OF A RĀHUI (NO-TAKE ZONE)**

- 7 Fishing is probably the most pervasive human activity which has impacted negatively on biodiversity throughout the seas and coastlines of New Zealand. There is now virtually nowhere that has not been fished, and its biodiversity impacted in some way, sometimes quite severely.
- 8 An obvious local example in the Bay of Plenty is the impact on shallow rocky reef ecology of removal of large numbers of snapper and crayfish. Both snapper and crayfish are major predators on kina or sea urchins, and normally keep their numbers in balance on a healthy reef. When too many crayfish and snapper are taken by fishing (snapper are down to 10% of their pre-fished biomass in the Bay of Plenty and can no longer carry out their natural ecological services), kina multiply and eat the natural kelp forest, leading to virtually bare rock areas with abundant kina. These areas are called “kina barrens” and have lost a huge amount of their natural biodiversity which was supported by the kelp forest. (See photo).



Shallow reefs on the east side of Motiti are pale-coloured because they lack the dark- coloured kelp forest naturally found there. Removal of too many snapper and crayfish has allowed kina to multiply and eat the kelp forest, destroying large areas of biodiversity. This can be restored to healthy kelp forest in a no-take zone.

- 9 Stopping fishing completely in an area is by far the most effective way of restoring biodiversity, as it allows exploited stocks to survive and grow old and bigger and to multiply, and to recover to a population structure where their ecological services are restored. They will eventually reduce the kina to natural numbers, and allow the kelp forest to recover complete with its thousands of associated organisms normally living beneath the kelp canopy.
- 10 Biodiversity benefits of no-take zones (rāhui, marine reserves, fisheries closures) are further discussed in Ballantine 2014, Thomas & Shears 2013, and Grace 2014 (citations below).

#### **BIODIVERSITY BENEFITS OF A RĀHUI AGAINST TAKING TAONGA SPECIES**

- 11 The biodiversity benefits of a rāhui against taking taonga species will depend on the ecological role of that species. In the example discussed above, a rāhui against taking snapper and crayfish will allow those species to grow and multiply, and to eventually recover to a point where their ecological services are restored. One of these services is to keep kina numbers in check. Once snapper and crayfish numbers and sizes have

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recovered and have eaten the kina back down to natural numbers, the kelp forest can recover and begin to support the thousands of smaller plants and animals normally found under a kelp forest. This is effectively recovery of biodiversity.

- 12 The biodiversity benefits of a rāhui against taking the taonga species hapuku are less clear because the natural ecological role of hapuku is not well understood. Hapuku are now at such a shockingly low population level in the Bay of Plenty, that there is little hope of understanding much at all about their ecology, let alone their interactions with other species and ecological role.
- 13 Hapuku is a large reef predator, and historically was abundant on shallow and deep reefs throughout the Bay of Plenty and most of NZ's coasts. As a top predator it probably had a major influence on the ecological structure of our shallow reefs, such as Astrolabe, but they have been so rare in recent years through gross overfishing that clear ecological understanding is lacking.
- 14 Protection of hapuku through a rāhui at Astrolabe/ Otaiti reef will probably, in the long run, allow some recovery of a hapuku population around the reef, though the situation may be complex because hapuku tend to migrate seasonally from shallow (Astrolabe) reefs to deep reefs (beyond Mayor Island/Tuhua) and return. There is no guarantee a hapuku protected at Astrolabe by a rāhui will survive on deeper reefs further offshore during its migration.
- 15 A small hapuku caught at Astrolabe by a salvage worker during the period of the exclusion zone, however, proves that at least some recovery of hapuku at Astrolabe may be possible given a chance. In itself that would be a biodiversity gain.

#### **OUR MARINE ENVIRONMENT 2016**

- 16 The Ministry for the Environment and Statistics NZ recently released the first report on the state of our marine environment (released 27<sup>th</sup> October 2016). The report recognizes that there are many gaps in knowledge, but that some areas of the marine environment are under severe pressure.

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- 17 The MFE report "Our Marine Environment 2016" provides an overview of the pressures New Zealand's marine environment faces, how it is changing, and the impacts on our biodiversity, economy, and way of life. It recognises the importance of many of New Zealand's threatened marine species as taonga and to marine ecosystem function and resilience.
  
- 18 Studies at the Cape Rodney to Okakari Point Marine Reserve (Leigh marine reserve) have shown that following adverse conditions in which crayfish walked away from the marine reserve, and were severely reduced elsewhere, the following recovery of crayfish numbers was much faster in the reserve than in areas outside the reserve. The reserve was shown to be much more resilient to change, and recovered faster, than the general fished coast.
  
- 19 With climate change, sea level rise, ocean acidification and other creeping impacts on our coastal seas, marine protected areas which have been allowed to recover to a close-to-natural state are far more likely to be resilient to change, and therefore likely to be sanctuaries for biodiversity lost in heavily fished areas.
  
- 20 In this context a rāhui at Astrolabe / Otaiti Reef is likely to assist in maintaining the Region's marine biodiversity and provide long-term biodiversity benefits to at least a small area of the Bay of Plenty. It may become more valuable as it is realized the rest of the Bay is suffering various impacts related to overfishing and climate change.

Sworn at Auckland  
 This 28<sup>th</sup> day of October  
 2016 before

) *Roger V Bruce*  
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*S. E. Richardson JP*

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 A Solicitor of the High Court of New Zealand / Justice of the Peace

S. E. RICHARDSON  
 TEACHER, AUCKLAND  
 JUSTICE OF THE PEACE  
 FOR NEW ZEALAND

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*S. E. Richardson*  
*Roger V Bruce*

## **ANNEXURE A.**

### **QUALIFICATIONS AND EXPERIENCE**

1. My name is Roger Vernon Grace.
2. I have a B.Sc., M.Sc. (Hons.), and Ph.D in Zoology (marine biology) from the University of Auckland (1972), and have carried out marine ecological studies for over 40 years.
3. For a few years in the late 1970's I was employed part time by a biological consulting firm in Auckland, gaining wide experience in field work, lab processing and reporting on studies in estuarine and coastal environments. Since then I have been a self-employed consultant with clients in Government Departments, local authorities, and the private sector, and various NGO's involved in environmental matters, in New Zealand and overseas. I was awarded a Queen's Service Medal (QSM) for public service in 2005. In 2016 I was awarded the Forest and Bird Old Blue award for many years of conservation effort in the marine environment around New Zealand.
4. My specialist fields include intertidal and sub-tidal benthic ecology, long-term monitoring of marine life in coastal and shallow benthic areas, including marine protected areas with various levels of protection, and effects of dredging and dredge spoil disposal and offshore sand extraction. My main experience has been gained in northern New Zealand.
5. In the mid 1960's as a student I spent two separate summer weeks camping at Mayor Island, snorkelling and diving amongst what was then abundant and rich fish life. Huge schools of trevally, kahawai and kingfish were abundant, scattered through the sea stretching from the Tauranga coast to Mayor Island, in what was truly the "Bay of Plenty". Sadly that abundance is now just a memory.
6. I have many years diving experience around offshore islands in Northland and the Bay of Plenty, and have good knowledge of shallow and deeper reef ecosystems in the Northeastern Bioregion from North Cape to East Cape.
7. As part of the Offshore Islands Research Group, derived from the Auckland University Field Club, I have camped on, and researched marine life at many offshore island groups

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*R. Richardson*

*Roger V. Grace*

in Northland, the Hauraki Gulf and several in the Bay of Plenty. Our interdisciplinary studies were published over many years in *Tane*, the official journal of the Auckland University Field Club. These studies now form a valuable scientific reference series for the natural history of many of our offshore islands.

8. In 1994 I was contracted for a short time by Bay of Plenty Regional Council to describe and assess sediment-bottom habitats within the limits of the Territorial Sea as part of their background information for various planning and statutory documents in the CMA.
9. From 1990 to 2007 I participated in many oceanic ship-based expeditions investigating fisheries, marine pollution, marine protection, Antarctic ecosystems, coral reefs, global warming and other issues in the Pacific and Indian Oceans, Southern Ocean, Scottish waters, Tasman Sea and the Mediterranean Sea.
10. In the 1990's I appeared as an expert witness in two hearings regarding the then proposed marina at Whangamata, presenting evidence on ecological and natural character matters, for Government and iwi clients.
11. For over twenty-five years I have carried out biological investigations into harbour ecology and the ecological effects of dredging the harbour channels in the Port of Tauranga, as well as the impacts of dredge spoil disposal offshore.
12. My first scientific investigations at Tauranga were in 1988 when I carried out informal sampling using a small biological dredge offshore from the Mount Beach and in the vicinity of the disposal grounds. This information was used to help plan the environmental assessment programme for the Port of Tauranga capital dredging works of 1992.
13. As a marine ecology consultant to Port of Tauranga Ltd. I have been involved in the planning and execution of biological programmes associated with channel deepening and widening, dredge spoil disposal and monitoring, dive surveys and sample processing, detailed photographic monitoring of subtidal rocky reef sites on the islands off the Mount, student research projects, boulder reef construction, assessment of life on wharf structures, impacts of dredging on pipi populations, impacts of log storage

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*Robert V. Brown*



runoff on shellfish beds, appearing as an expert witness at Council and Environment Court hearings, and most recently discussions with iwi representatives on the Kaimoana Restoration Programme sponsored by PTL.

14. Early in 2014 I was approached by the Motiti Rohe Moana Trust to act on their behalf as an expert witness on marine biological matters in relation to the Rena application. The Trust is no longer involved in that application process.

#### REFERENCES

Ballantine, W.J. 2014 Fifty years on: lessons from marine reserves in New Zealand and principles for a world-wide network. *Biological Conservation* 176:297-307.

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Thomas, H.L. & Shears, N. 2013 Marine Protected Areas: A comparison of approaches. For Royal Forest and Bird Protection Society of New Zealand, Wellington, New Zealand.

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Ray V. Grace