

BEFORE THE ENVIRONMENT COURT  
AT AUCKLAND

IN THE MATTER: of the Resource Management Act 1991

AND

IN THE MATTER: of appeals pursuant to clause 14 of the  
First Schedule to the Act

BETWEEN MOTITI ROHE MOANA TRUST

(ENV-2015-AKL-000134)

NGATI MAKINO HERITAGE TRUST

(ENV-2015-AKL-000140)

NGATI RANGINUI IWI INCORPORATED  
SOCIETY

(ENV-2015-AKL-000141)

Appellants

AND

BAY OF PLENTY REGIONAL COUNCIL

Respondent

AND

VARIOUS

Section 274 Parties

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STATEMENT OF EVIDENCE OF SHARON DE LUCA

7 November 2017

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I, **Sharon Betty De Luca** of Tauranga, Ecologist state:

### Introduction

1. I am an Associate Partner and Senior Ecologist with Boffa Miskell Limited (**BML**) specialising in marine ecology.
2. I have been engaged by Bay of Plenty Regional Council (**Regional Council**) to provide independent expert evidence on matters pertaining to marine ecology arising in these proceedings.
3. I hold the qualifications of Bachelor of Science (Zoology) and Doctor of Philosophy (Environmental and Marine Science) from the University of Auckland.
  - 3.1 I have worked for BML for the past twelve years. I have previously worked for City University of Hong Kong (as a Post-Doctoral Fellow) on a variety of research projects focusing on coastal ecology, ecotoxicology, marine microbiology and the development of new techniques for monitoring sublethal stress in marine invertebrates.
  - 3.2 I am a registered member of The Royal Society of New Zealand, the New Zealand Coastal Society and the Environment Institute of Australia and New Zealand and have practiced as an environmental scientist for more than 16 years. I am a Certified Environmental Practitioner with the Environment Institute of Australia and New Zealand and I am bound by the Institute's code of ethics. I have published 14 scientific papers in peer reviewed international journals.
  - 3.3 My relevant experience in marine ecology includes:
    - (a) MV Rena - Application to Abandon the Wreck, 2016-2017. My role as marine ecology and ecotoxicology expert was to review all of the data and information presented in the Regional Council hearing, carry out a gap analysis, develop a scientific work programme to cover off the information gaps, assess the long term ecological monitoring programme, assess the effects of abandoning the wreck, and prepare and present evidence at Environment Court hearing. As part of this work I dived at Otaiti and reviewed video footage and photographs;
    - (b) Assessment of Effects of Wastewater Discharges, 2014: Assessing the quality of the intertidal and subtidal marine receiving environment adjacent to the Omau Beach (Tauranga) wastewater discharge point, including shellfish

abundance, quality and diversity, sediment quality, faecal microbiology survey, and stable isotope assessment;

- (c) Maintenance Discharges from the Auckland Harbour Bridge, 2011-2015: Assessing effects on the marine environment of contaminants (including lead, zinc, paint and sand) from maintenance of the Bridge. This project won a Best Practice Award for Excellence in Integrated Planning at the NZPI 2015 Annual Awards and a merit award at the ACENZ Innovate Awards in 2016; and
- (d) Auckland Unitary Plan Hearings (2016): I presented expert witness evidence to the hearings panel on several issues for a number of clients. The main issues were the effects of potential changes in zoning and housing density on marine ecological values, the appropriateness of some significant ecological areas within the coastal marine area (CMA) and mangrove management.

4. I am familiar with the subtidal habitat within the subject area (Motiti Natural Environment Management Area (**MNEMA**)) through recreational dives and familiar with Otaiti through review of video footage, photographs and a dive carried out as part of assessing the effects of abandoning the Rena wreckage (paragraph 3.3 (a) above).
5. I have read the Code of Conduct for expert witnesses in the Environment Court Practice Note 2014. I agree to comply with that Code. The evidence in my statement is within my area of expertise, except where I state that I am relying on the evidence of another person. I have not omitted to consider material facts known to me that might alter or detract from the opinions I express.

#### **Scope of Evidence**

6. My evidence will address the following issues and themes arising out of the relief sought by the Appellant, Motiti Rohe Moana Trust (**MRMT**) in these proceedings:
  - (a) Ecological values of the MNEMA;
  - (b) Impact of fishing;
  - (c) Restoration of marine ecological values in the Bay of Plenty;
  - (d) Protection options.

## Summary

7. The proposed MNEMA comprises a number of islands and reefs largely around Motiti, Motunau and Motuhaka islands and Otaiti and Okaparū reefs. The marine ecological values of the proposed MNEMA and the wider Bay of Plenty have been affected, and continue to be affected, by fishing.
8. The Fisheries Act provides a range of mechanisms for the management of fisheries including commercial quota setting, regulating fishing types and vessel size, recreational catch limits etc. That Act also provides for tangata whenua to establish control over fisheries resources within their rohe moana through the establishment of Mātaihai reserves and Taipure-local fisheries.
9. In order to move towards an objective of the restoration of marine ecological values and populations of harvested species to pre-fished levels, in my opinion, taking a holistic approach to the establishment of a well-designed network of no-take marine protected areas (MPA), based on robust scientific data is required. There are gaps in our knowledge relating to the abundance and distribution of commonly harvested species which would need to be addressed in order to design such a network of MPAs within the Bay of Plenty.
10. Whilst the proposed MNEMA would have benefit to marine ecological values, it is my opinion that in order to maximise benefits to the marine environment, establishment (in perpetuity) of a network of no-take areas needs to be undertaken at a regional or larger scale, be based on robust marine science, and be appropriately managed and enforced. I consider that BOPRC could have a role in supporting such endeavours, but it is my opinion that established mechanisms through the Fisheries Act and the Marine Reserves policy and legislation are likely to be better set up to facilitate, manage and enforce no-take areas.

## Ecological Values of MNEMA

11. The proposed MNEMA comprises a number of islands and reefs largely around Motiti, Motunau and Motuhaka islands and Otaiti and Okaparū reefs. A 3 nautical mile radius around Otaiti and other marine features forms the boundary of the proposed MNEMA.
12. Otaiti has similar ecology to many other reefs and islands in the Bay of Plenty, including Okaparū Reef, Motuhaka (Schooner Rocks), Tokoroa Shoal, Brewis Shoal, Penguin Shoal, Motunau (Plate Island), Tuhua Reef and Tuhua Island. All of the

habitat types present at Otaiti are present at other sites throughout the Bay of Plenty and along the east coast of the North Island. The habitat types, indigenous biological diversity and ecological values present at Otaiti are described in the evidence of Dr Ross.

13. Dr Shears also concludes that the reef ecosystems within the proposed MNEMA and wider Bay of Plenty are typical of those found on the exposed north-east coast of New Zealand<sup>1</sup>.
14. Within the proposed MNEMA there are a number of Indigenous Biodiversity Areas (IBDA) (Category A) recognised in the Proposed Coastal Plan; being part of Motiti Island, Astrolabe Reef, Motuputa Island and Motunau. I have **attached** the relevant Coastal Plan map (IBDA A75-79 in Schedule 2, Map 43b and the legend) to my evidence (**Appendix A**). There are policies and rules in the Coastal Plan that provide protection of the ecological values of the IBDA's and I understand those provisions (or the identification of IBDA's within the Proposed Plan) are not the subject of these proceedings.
15. Although not the subject of these proceedings, for completeness and context I have summarised the Proposed Plan's descriptions of IBDA areas relevant to Motiti Island and Astrolabe Reef (Otaiti) and the wider MNEMA. The ecological values on Motiti Island include a range of *At Risk* and *Threatened* birds, a *Threatened* plant and an *At Risk* plant, plus ecosystem types that are rare or threatened under the NZCPS. Astrolabe Reef is an uncommon ecosystem (pinnacle) and has diverse fish populations. Motuputa Island supports a *Threatened* plant and has the highest quality offshore rock stack in the Motiti Ecological District. Motuputa Island is regionally significant. Motunau is nationally significant and supports a range of *Threatened* and *At Risk* birds and herpetofauna, in addition to surface schooling trevally, kahawai and maomao. Importantly, Motunau has a rift in the centre of the island that contains diverse deep water species (e.g. sponges, hydroids and bryozoans) in shallow water. Motunau is protected as a Wildlife Sanctuary administered by the Department of Conservation.
16. Dr Ross, at paragraphs 14-18 of his evidence, summarises marine monitoring programmes at a number of island and reef sites within the Bay of Plenty that have been undertaken in the recent past. In addition, the conditions of consent relating to the abandonment of the Reha wreck include the requirement for ongoing monitoring at Otaiti and reference sites. While the precise format of the monitoring is subject to

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<sup>1</sup> Paragraph 6 of Dr Shears' Evidence in Chief.

the approval of a yet to be set up Independent Technical Advisory Group (ITAG), the monitoring is likely to include contaminants in sediment and biota, and subtidal ecology over the next 10 years.

17. Dr Ross, at paragraph 20 of his evidence, notes a number of knowledge gaps regarding the abundance and distribution of commonly harvested species such as fish, crayfish and sea urchins. These knowledge gaps (amongst others) are common to the large majority of coastal areas around the country, including the proposed MNEMA.

### **Impact of Fishing**

18. There is extensive commercial trawling (which includes purse seine<sup>2</sup>, Danish seine<sup>3</sup>, bottom trawl<sup>4</sup>), set netting, lobster potting and line fishing throughout the Bay of Plenty although, as explained in the evidence of Mr Hill on behalf of the Attorney-General, there are certain restrictions on trawling and Danish seining. Mr Hill and Mr Fraser for the Regional Council state that the Bay of Plenty area is a popular area for commercial, recreational and customary fishing.
19. Intensive long lining and set-netting occurs throughout the Bay of Plenty. Rock lobster potting occurs on and adjacent to subtidal rocky reef habitat, with commercial rock lobster fishing historically focussing on Okaparū Reef, Brewis Shoal and Otaiti in the western Bay of Plenty.
20. Recreational fishing effort in the Bay of Plenty is also widespread. Hotspots for recreational boating density occur around the off-shore islands, including Motiti, Tuhua (Mayor), Raurima, Moutohora (Whale), and Whakaari (White Island). Recreational target species include snapper, kahawai, kingfish, terakihi, trevally, gurnard and rock lobster<sup>5</sup>.
21. Mr Hill states that there are currently seven rohe moana areas in the Bay of Plenty where Tangata Kaitiaki/Tiaki are responsible for managing customary gathering of fish, aquatic life or seaweed within their published rohe moana for customary purposes.

<sup>2</sup> Purse seining is widely undertaken within the Bay of Plenty, and involves setting a large wall of net around a school of fish in a circle and drawing close the bottom of the net.

<sup>3</sup> Danish seining involves the towing of a net with weighted lines pulled across the sea floor to herd fish into the net. Danish seining also occurs through the Bay of Plenty, with greater pressure around Tuhua and Matakana Islands.

<sup>4</sup> Bottom trawl effort is extensive throughout the Bay of Plenty, primarily around Okaparū Reef, Brewis Shoal and Otaiti, with less effort around Motiti Island

<sup>5</sup> Paragraph 16, Mr Hill EIC.

22. Fishing, over the past century, has had, and continues to have, significant adverse effects on marine ecology, through physical damage, depletion of fish stocks and changes to some predator-prey relationships.
23. Physical damage to marine habitats occurs through some fishing methods, with the greatest damage done by trawling and dredging. To a lesser extent, anchoring and potting can scrape and scour rocky reef habitat and disturb soft sediment habitat.
24. Many fish stocks have been reduced to a biomass significantly below their sustainable biomass. For example, in 2014, MPI estimated snapper biomass in the Bay of Plenty to be 13% of the pre-fished biomass and Dr Grace<sup>6</sup> refers to snapper biomass currently being around 10%.
25. The scientific literature makes a clear link between reduced predation on kina due to decreased fish and rock lobster abundance from fishing, the increase in kina, and the reduction of macroalgae through kina grazing resulting in "kina barréns". The development and distribution of urchin barréns is described in the evidence of Dr Shears (Appendix B of his Evidence in Chief).
26. The long-term decline in marine ecological values that has occurred over the past century is likely to continue if fishing is not reduced or no-take areas established for the purpose of restoring stocks.

#### **Management of Fisheries in the Bay of Plenty**

27. Mr Hill, in his evidence, describes how the Fisheries Act regulates marine species, stock and effects through setting commercial quota, prohibiting certain size of vessels, and types of fishing, identifying areas able and not-able to be fished, catch limits and size limits. In addition, Mr Hill describes a range of mechanisms under the Fisheries Act that can be used by tangata whenua to regulate and control fishing in their rohe moana including Mataitai reserves, Taipure-local fisheries, and temporary closures.
28. Mr Hill describes how the controls proposed by MRMT are available under the Fisheries Act and other existing mechanisms and discusses how the establishment of no-take areas can conflict with commercial, recreational and customary fishers.

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<sup>6</sup> Paragraph 18, Dr Grace Evidence in Chief.

### Restoration of marine ecological values in the Bay of Plenty

29. In order to move towards an objective of the restoration of marine ecological values of the Bay of Plenty to pre-fished levels, in my opinion, a holistic approach to the establishment of a well-designed network of fully protected marine protected areas (MPA), based on robust scientific data is required. Dr Shears also concludes that MPAs need to be well-designed (paragraph 6 of his Evidence in Chief). A network of MPAs, compared to single MPAs, is more likely to result in the restoration of marine ecological values. Department of Conservation (2000), in their Biodiversity Strategy, recommend 10% of the territorial sea is set aside as marine reserves. In addition, I support the widely held view that protection of MPAs should be provided in perpetuity in order to achieve effective marine conservation (Day et al., 2012<sup>7</sup>). The requirement to review regional plans every 10 years, and the ability for more regular plan changes, does not provide certainty for long-term protection of the proposed MNEMA.
30. Dr Grace, in his evidence<sup>8</sup>, describes the restoration outcomes of two types of marine protected areas, with one being complete no-take (Tawhāranui) and the other having only partial protection (Mimiwhangata). Dr Grace notes that partial protection (i.e. only banning commercial fishing) has not been effective in restoration of snapper and rock lobster due to high recreational fishing pressure. I agree with Dr Grace's conclusion that total protection (in perpetuity) within MPAs is required to restore taonga species such as snapper and rock lobster.
31. MRMT propose no-take areas at 14 waahi tapu sites and at Otaiti, whereas the larger waahi taonga area could be fished, subject to demonstrating that urchin barrens comprise less than 10% of the shallow subtidal reef habitat (for restricted discretionary status) and obtaining consent. With respect to the no-take areas, aside from the difficulties in managing and enforcing 14 smaller no-take areas (radius of 1 nautical mile, c. 1,077 ha) around wāhi tapu sites and one larger no-take area (radius 3 nautical mile, c. 9,634 ha) around Otaiti, it is my opinion that a fragmented set of smaller no-take areas surrounded by areas that could be fished may not achieve the wider spill-over (i.e. enhancement beyond no-take boundaries) benefits sought by the MRMT.

<sup>7</sup> Day, J., Dudley, N., Hockings, M., Holmes, G., Laffoley, D., Stolton, S., Wells, S., 2012. Guidelines for applying the IUCN Protected Area Management Categories to Marine Protected Areas. Gland, Switzerland: IUCN.

<sup>8</sup> Paragraphs 56-72, Dr Grace Evidence in Chief.

32. There is likely to be localised enhancement and recovery of predators that have high site fidelity<sup>9</sup> within some parts of the 1 nautical mile areas proposed, and at Otaiti, but the extent to which those areas could contribute to populations and ecological values beyond those sites is unknown. With respect to allowing fishing within the waahi taonga area (subject to triggers and consent), I note that the population density of top predators can be affected with relatively low fishing pressure<sup>10</sup>, meaning that a return to fishing within the waahi taonga area<sup>11</sup> could undo the potential positive effects of a temporary non-take area and may reduce the potential for the spill-over of large roaming predators (e.g. snapper) beyond the wāhi tapu sites.
33. In order to achieve maximum benefit, the design of MPA networks is important and must be based on a thorough understanding of numerous factors<sup>12</sup> including:
- Hydrodynamic environment;
  - Identification of priority restoration species (e.g. snapper, rock lobster);
  - Current distribution and abundance of priority species within the Bay of Plenty region;
  - Larval behaviour, retention, distribution and connectivity for each of the priority species;
  - Inter-relationship between habitat types;
  - Key habitats used by each priority species at different life stages; and
  - Spatial arrangement of habitats for settlement of larvae.
34. As noted by Dr Ross, there are significant gaps in our current understanding of some of the points above. A programme of research could be developed to close off these gaps in the science and inform the establishment of a network of MPAs in the Bay of Plenty region. Without this information to inform size and location of MPAs, maximum benefit within and outside of protected areas may not be achieved. It is my opinion that this range of information should be used to design and assess the

<sup>9</sup> Site fidelity can be defined as the tendency of an animal to remain in an area over an extended period or return to an area previously occupied.

<sup>10</sup> Jennings, S., Polunin, N.V.C., 1996. Effects of fishing effort and catch rate upon the structure and biomass of Fijian reef fish communities. *Journal of Applied Ecology*, 33, 400-412.

<sup>11</sup> Pursuant to restricted discretionary consents once the kina count trigger is reached, assuming no discretionary consents are granted until that occurs.

<sup>12</sup> Le Port et al., 2017. Temperate marine protected area provides recruitment subsidies to local fisheries. *Proceedings of the Royal Society B*, 284: 20171300. <http://dx.doi.org/10.1098/rspb.2017.1300>

proposed MNEMA. I am not aware of any Government department, Ministry, agency, or regional councils carrying out such a body of work anywhere in New Zealand to inform design of regional marine reserve networks.

35. Assuming personnel and weather are not a barrier, such a programme of work could be carried out, supported by modelling (as described by Le Port et al., 2017<sup>12</sup>), over a period of a few years<sup>13</sup>. The time required for the science work programme also allows time for consultation with all interested stakeholders to be undertaken concurrently.
36. Assuming that there is a reasonable understanding of most of the above factors, and therefore the main research required to inform MPA network design is current distribution and abundance of priority species throughout the region, and modelling of larvae movement, I very roughly estimate the cost of such marine science research to be in order of \$400,000.<sup>14</sup>
37. I agree that establishment, management, monitoring and enforcement of the MNEMA would result in a benefit for marine ecological values. However, it is my opinion that there is time to undertake the research required to inform the thoughtful design of MPAs in the Bay of Plenty region, and that taking a well-planned approach will result in being able to maximise ecological outcomes.
38. I do not consider that the marine ecological values within the MNEMA will significantly decline further while information is collected over a period of a few years i.e. the marine ecological values are not at a crisis point where immediate action must be taken. It is likely that following the collection and analysis of the data required to inform MPA design, areas within the MNEMA could be recommended for protection in perpetuity.
39. In order for the MPAs to be effective, it is critical that there is an appropriate level of management, monitoring and enforcement. Dr Shears concludes that for MPAs to be effective there needs to be adequate enforcement (paragraph 6 of his EIC). Enforcement of fisheries related activities is currently the responsibility of the Ministry for Primary Industries and the Department of Conservation, not Regional Council.

<sup>13</sup> The time required for the science work programme also allows time for consultation with all interested stakeholders to be undertaken concurrently.

<sup>14</sup> Based on an estimate of \$10,000 a day for four divers, skipper and boat, surveying over 20 days, \$50,000 for analysis of video footage, \$50,000 for collating relevant data from the literature, \$50,000 for modelling of larvae movement, and \$50,000 to pull all the information together and develop the draft network of MPAs.

40. I support the intent of the MRMT in regard to the restoration of marine ecosystems and species, acknowledging that I would support such an objective in all areas of the Bay of Plenty facing similar outcomes from overfishing. However, I understand that MRMT propose two rules about the taking or not taking of marine organisms. Rule 5 is effectively establishing no-take areas within the wāhi tapu areas<sup>15</sup>. Rule 4 allows for fishing to resume within the waahi tāonga area (subject to resource consent) once the marine ecological values within the MNEMA have recovered to a level where sustainable harvesting could be undertaken.<sup>16</sup> Rule 4 (c) states that a requirement of the restricted discretionary consent is that no more than 10% of shallow reef habitat is classified as urchin barren<sup>17</sup>.
41. I have concerns about such an approach for two reasons; firstly, that the proposed trigger for harvesting (pursuant to a resource consent) is not sufficiently robust and secondly, that MPAs should be robustly designed and established in perpetuity as benefits from establishing a MPA can be lost quickly once protection is removed (Jennings and Polunin, 1996).
42. With respect to the individual no-take areas proposed, it is important that the size of those areas is larger than the distance travelled by the larvae of the priority restoration species, in order for the benefits of the no-take area to manifest within the no-take area (Le Port et al., 2017). Larval behaviour is only one of the factors to be considered when designing no-take areas as stated at paragraph 33 above. It is my opinion that establishment of no-take areas, if not supported by robust science, may not achieve or may not maximise the outcomes sought.
43. The MRMT propose that fishing could occur within the waahi taonga area (pursuant to a resource consent) subject to a kina barren count of less than 10%, confirmed by two surveys at least three months apart. Mr Kerr, at paragraph 50 of his Evidence in Chief, sets out potential management triggers for enabling fishing. Dr Grace agrees with these triggers (paragraph 86 of his Evidence in Chief). Mr Kerr proposes that urchin barren extent (5-10%) and expansion, plus low reef fish diversity and low counts of large snapper and crayfish could trigger restrictions on fishing.
44. I do not consider that the trigger proposed by the MRMT (urchin barren extent confirmed over two surveys) is sufficiently robust to be a proxy for marine ecosystem

<sup>15</sup> The taking, removal, damage or destruction of indigenous flora or fauna (Proposed Rule MNEMA 5, Supplementary Evidence of Graeme Lawrence).

<sup>16</sup> This assumes that fully discretionary consents are not granted prior to the urchin barren trigger being met.

<sup>17</sup> Meaning less than 10% of shallow reef, classified as sea urchin preferred habitat area, occupied by sea urchin. Proposed Rule MNEMA 3, Supplementary Evidence of Graeme Lawrence.

health. I also have concerns that the triggers proposed by Mr Kerr (urchin barren extent, reef fish diversity, snapper and rock lobster size and abundance) may not provide sufficient understanding of ecosystem health.

45. MRMT are seeking intervention based on a relatively simple relationship (i.e. that fish eat kina, and kina eat kelp). However, ecological relationships are more complex than that relationship and enhancing marine ecological values or indigenous biodiversity requires an ecosystem approach. I consider that a study of all trophic levels and their interactions would be required in order to accurately assess whether a marine ecosystem could support a return to fishing. There is much discussion in the scientific literature about moves, across many parts of the world, towards changing from single species fisheries management to ecosystem-based fisheries management (e.g. Pikitch et al., 2004, Beddington et al., 2007, Smale et al., 2012)<sup>18</sup>. In my opinion an ecosystem-based approach to monitoring and managing the proposed MNEMA would need to be taken should the MRMT's proposal be upheld by the Court.
46. Through individuals or groups applying for a resource consent to fish in the future restored MNEMA, an assessment of effects on the environment would need to be carried and would need to robustly demonstrate no significant adverse effects on marine ecological values. The research that would be required to robustly assess the effects of resumed fishing on the ecosystem would need to be extensive and may need to be undertaken over several years in order to fully understand the state of the marine ecological values, the fisheries resources and potential cumulative effects of multiple fishers obtaining consent.
47. Mr Hill describes the resourcing and expertise required to carry out fisheries compliance and enforcement work. I am not aware of the Regional Council currently having the resources or in-house expertise to be able to undertake similar work if the Court upheld MRMT's appeal and the Council became responsible for managing and enforcing the no-take areas as proposed. I also note that a considerable level of expertise would be required in order for Council officers to determine whether to grant resource consents for the resumption of fishing, particularly the proposed discretionary consents which are not based on the ecological trigger. I agree with the

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<sup>18</sup> Pikitch et al., 2004. Ecosystem-based fishery management. *Science*, 305, 346-347.  
Beddington, et al., 2007. Current problems in the management of marine fisheries, *Science*, 316, 1713-1716.  
Smale et al., 2012. Regional-based benthic monitoring for ecosystem-based fisheries management (EBFM) using an autonomous underwater vehicle (AUV). *ICES Journal of Marine Science*, 69 (6), 1108-1118.

evidence of Mr Fraser that a comprehensive Assessment of Effects would be required, even for the restricted discretionary activity.

48. In my opinion, there is a risk that the fishing managed by the Regional Council through resource consenting could disrupt the ecological processes and potentially further undermine the marine ecological values that are sought to be protected in the first place. A very clear and consistent consenting strategy would need to be developed based on robust ecological evidence. If the granting of consent(s) led to decline in harvest species or ecosystem damage, the restoration benefits achieved through establishment of the discrete no-take areas could be undone. In addition, it is not clear if consents could then be cancelled if that was indeed the outcome. The term of the consents and the ability to review them would be important considerations. I also have concerns that the time involved in monitoring, reporting and reviewing any consents granted may be too long to ensure damage to fish stocks or marine ecological values is avoided.
49. There appears to be a disconnect between the objectives of the ecological experts for MRMT (which essentially seek marine protected areas in the usual sense of protection in perpetuity) and the design of the rules proposed by MRMT through Mr Lawrence. In my opinion, it is critical to ensure that the supporting rules framework will in fact achieve the restoration objectives which appear to be sought by MRMT.
50. It is my opinion that better ecological outcomes can be achieved through the establishment of a network of MPAs in perpetuity. If a well-designed network of MPAs is established throughout the Bay of Plenty region, then harvest species are likely to be enhanced, not only within any MPAs, but outside of them (Le Port et al., 2017). In my opinion, a network of permanent MPAs, instead of temporary protection of certain areas, would be more likely to enhance marine ecological values throughout the region and enhance populations of important marine organisms both within and outside of MPAs.

### **Protection Options**

51. There is an opportunity, through the Marine Reserves Act, outside of the Regional Coastal Plan framework, for a robust and holistic approach be taken to the establishment of a network of fully protected MPAs within the Bay of Plenty in order to restore marine ecological values. In my opinion, such an approach would maximise ecological benefits compared to the proposal from the MRMT.

52. As noted in paragraph 21 above, there are also other commonly used mechanisms available to tangata whenua through the Fisheries Act to close fishing within rohe moana areas, such as establishment of Mataitai reserves and Taipure-local fisheries.
53. It is my opinion that central government organisations such as the Ministry for Primary Industries and the Department of Conservation are better set up to monitor and enforce fishing activities, and to establish, manage, monitor and enforce marine protected areas, respectively, compared to the Regional Council which has not undertaken such a task to date.
54. In my opinion, a network of MPAs, established in perpetuity, rather than temporary or partial control would be more likely to benefit the marine ecosystem and restore ecological values. No-take marine reserves seek to protect all components of a marine ecosystem. Some gaps in the science understanding need to be addressed in order to undertake the analysis required to make recommendations for MPAs. Through the establishment of marine reserves, the appropriate management, monitoring and enforcement can be assured which is required to ensure that the outcomes sought are achieved.

#### **Marae-based Aquaculture**

55. Rule 2 of the proposed MNEMA includes marae-based aquaculture within the Waahi Taonga area as a controlled activity, subject to aquaculture rule AQ 2. Rule AQ 2 allows for aquaculture to be undertaken for the purpose of enhancing and restocking indigenous coastal species as a controlled activity. I support marae-based non-commercial aquaculture within the proposed MNEMA for the purpose of enhancing and restocking indigenous marine organisms, on the basis that adverse ecological effects that may arise due to the aquaculture activity can be avoided, remedied or mitigated.

#### **Summary**

56. Establishment of no-take MPAs within the Bay of Plenty Region is required to restore marine ecological values affected by fishing. A holistic approach, informed by good science, should be taken to development of a network of no-take MPAs to ensure that benefits to marine ecological values accrue beyond MPA boundaries. Information on the abundance and distribution of key species could be undertaken over a few years to inform location and size of MPAs. The network of no-take MPAs within the Bay of Plenty marine environment should be established in perpetuity under the Marine Reserves Act.

57. There is significant agreement between myself and the marine ecology experts who prepared evidence on behalf of the Motiti Rohe Moana Trust. I have summarised below in Table 1 where I see the areas of agreement and disagreement between the marine ecology experts to assist the court.

*Table 1: Agreement on Marine Ecology Matters*

Matter	Agreement
The full range of habitats and ecological values within the proposed MNEMA are represented elsewhere in the Bay of Plenty.	Agreed, Drs De Luca, Ross and Shears
The MNEMA and wider Bay of Plenty marine environment has been significantly adversely affected by fishing.	Agreed, Drs De Luca, Ross, Grace, Shears, and Messers Kerr and Guccione.
In order to restore the marine ecological values of the MNEMA and wider Bay of Plenty marine environment the establishment of no-take areas are required.	Agreed, Drs De Luca, Ross, Grace, Shears, and Messers Kerr and Guccione.
An integrated, holistic approach to the establishment of marine protected areas within the Bay of Plenty region should be undertaken.	Opinion of Dr De Luca. Others silent on this matter.
There are gaps in the science on the abundance and distribution of priority restoration species.	Agreed Drs De Luca and Ross. Mr Kerr recommends a larger scientific work programme be undertaken.
A well-designed network of MPAs should be established.	Opinion of Dr De Luca. Others silent on this matter.

MPAs should be fully, not partially, protected.	Agreed Drs De Luca and Grace and Mr Kerr.
MPAs should be established in perpetuity.	Opinion of Dr De Luca. Others silent on this matter.
The Bay of Plenty marine environment is not at a crisis point where immediate action must be taken, without sufficient information, to arrest a decline in ecological values	Opinion of Dr De Luca. Others silent on this matter.
Resumption of fishing within the MNEMA, once certain trigger levels have been achieved, is a risk to the future marine ecological values restored through establishment of a no-take area.	Opinion of Dr De Luca. Others silent on this matter.
Measurement of kelp cover, urchin barren area, reef fish diversity and size and abundance of snapper and rock lobster can be used as appropriate triggers for management of the ecosystem.	Agreed Drs Grace and Messers Kerr and Guccione.  Disagreed Dr De Luca.
Appropriate management, monitoring and enforcement are required to ensure successful MPA outcomes.	Agreed Drs De Luca and Shears.
The Marine Reserves Act provides for the establishment, management, monitoring and enforcement of MPAs.	Opinion of Dr De Luca. Others silent on this matter.
The Fisheries Act provides mechanisms for Tangata whenua to control fishing within their rohe moana.	Agreed Dr De Luca and Mr Hill.

Dated 7 November 2017



**Sharon Betty De Luca**

**Appendix A: Map 43b Motiti Island – Proposed Regional Coastal Environment Plan – Ecological.**

# Proposed Regional Coastal Environment Plan

 Landward Extent of the Coastal Environment

## Landscape

 Outstanding Natural Features and Landscapes

## Ecology and Heritage



Shipwreck



Surf Breaks



Historic Heritage Inventory



Indigenous Biological Diversity Area A



Indigenous Biological Diversity Area B



Areas of Significant Cultural Value



ASCV 25 – Motiti Island and associated Island, reef and shoals – points of cultural significance

## Use



Area Occupied by Port of Tauranga



Harbour Development Zone



Tauranga Harbour Port Zone



Mooring Area



Personal Water Craft Area



Water Ski Access Lane



Water Ski Area



Coastal Marine Boundary at Rivermouth



River Mouth



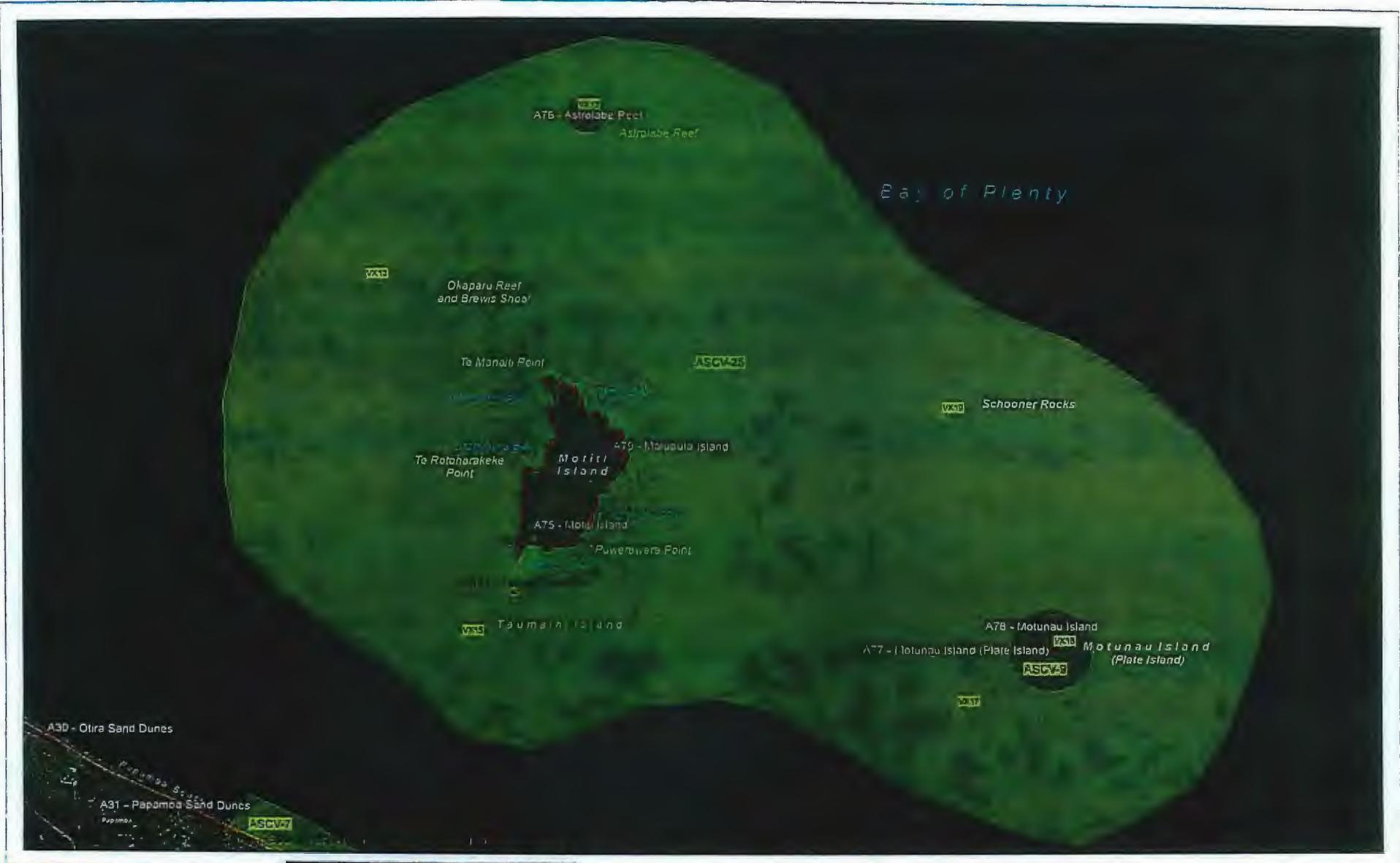
Airport Height Restrictions (metres)



Port Noise - 55dBA Noise Control Boundary



Port Noise - 65dBA Noise Control Boundary



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**43b\_Motiti Island**  
 Proposed Regional Coastal Environment Plan - Ecological

Published June 2015  
 GIS\_459085