BEFORE THE ENVIRONMENT COURT
Auckland Registry

ENV 2015 AKL 0000134

IN THE MATTER	of the Resource Management Act 1991
AND	of an appeal under Clause 14 of the First Schedule of the Act
BETWEEN	**TRUSTEES OF MOTITI ROHE MOANA TRUST**
	Appellant
AND	**BAY OF PLENTY REGIONAL COUNCIL**
	Respondent

STATEMENT OF EVIDENCE OF UMUHURI MATEHAERE ON BEHALF OF MOTITI ROHE MOANA TRUST

25th October 2017

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Introduction

1. My name is Umuhuri Mateheare. kaumātua of Te Moutere o Motiti, Chairman for the Motiti Rohe Moana Trust.

2. I am of Ngāi Te Hapu, Te Patuwai, Ngāti Makerewai, Ngāti Takahanga, Ngāti Pukenga, Ngāi Tauwhao and Ngāti Whakahemo descent.

3. I was born in 1943 and raised on Motiti Island. My family has long and deep connections to the Island and we continue to play integral roles within the Motiti community.

4. In 2009, the Motiti Rohe Moana Trust ("the Trust") was established as we needed a legal entity that could represent tangata whenua in various proceedings. I am the Chairman of the Trust, a role that I have held since the Trust was established.

5. In this evidence, I will provide the Court with some background information about Te Moutere o Motiti, and address the main issues that underpin our Appeal to the coastal environment plan.

6. These are:

   (a) Tangata whenua identity, culture and economy;

   (b) Kaitiakitanga (s7a);

   (c) Taonga (s6e);

   (d) Issues arising and why Motiti rohemoana is regionally significant and special.

7. Firstly, I adopt my previous evidence given in earlier proceedings (attached as **ANNEXURE A**).

Ngā Hapū o Te Moutere o Motiti

8. This appeal is brought by the Motiti Rohemoana Trust on behalf of ngā hapū o Motiti who are tangata whenua of Te Moutere o Motiti. We are most closely associated with Ngāi Te Hapū me ona karanga hapū, including Ngāti Makerewai, Ngāti Takahanga, Ngāti Kauaewera, Ngāti Te Uru, Ngāti Pau, and Te Patuwai ki Motiti ("Ngā Hapū o Te Moutere o Motiti"). However, we wish to acknowledge our other whakapapa as well, because on Motiti the relationships are very close.

9. Ngāi Te Hapū are descendants of the eponymous tupuna Te Hapū. Te Hapū was a direct descendant of Toroa, the captain of the Mataatua waka.

10. Te Hapū came westwards with the heke to Tauranga led by Te Rangihouhiri. Te Hapū went directly to Motiti, where he lifted the tapu put on the island by Waitaha, his mother's people, and settled there. The descendants of Te Hapu came to be known as Ngāi Te Hapū. The karanga hapū derive from his children and descendants. Te Patuwai is a name referring to a battle at sea, and the name was adopted by descendants of Ngāi Te Hapū. (Nepia Ranapia will give further history and tikanga of Motiti in his evidence.)

11. *Ko au ko Motiti, ko Motiti ko au* [I am Motiti. Motiti is me]. The island is the centre of our universe. It is the wellspring of our identity, our beginning and our end. It is our most precious taonga.

12. We do not rely on others in the exercise of mana and we have maintained our own identity as the tangata whenua of Motiti Island through independent, community-based decision-making. This is shown in our history as it is the hapū of the moutere that have maintained our relationships with our moutere, keeping our identity alive.

13. In this regard, our community is largely autonomous from those on the mainland and decisions about the island are appropriately made by those of the island. *Mā Motiti, mō Motiti* [By Motiti, for Motiti]. In our tikanga, the

tangata kaitiaki are the people who hold the ahi kā. We are the haukāinga and it is we who know the island and its environment intimately.

14. Motiti tangata whenua are Māori who whakapapa to Motiti and are descended from the original indigenous landowners recognised by the Native Land Court in the late 19th century when the original Crown grants and partitions of Motiti Island occurred.

15. Motiti Island is an offshore island. Being separated from the mainland means that it is also separated from the geographical iwi boundaries there, and therefore Motiti tangata whenua do not easily fall within the Crown's *'iwi'* and "*large natural groupings*" classifications.

16. Ngā Hapū o Te Moutere o Motiti stand separate from mainland iwi, both geographically and culturally. Ngā Hapū o Te Moutere o Motiti only exist at Motiti and do not exist or have *turangawaewae* on the mainland. We are people of the island, people of the sea.

17. As island people, we were reliant on the ocean that surrounds us, and our rohe moana extends over the ocean and the nearby toka (reefs) and motu (islets). This includes our relationship with Te Tau o Taiti (Ōtāiti, or Astrolabe Reef), located a short distance north of the island, which is a taonga to us and was historically an important fishing ground. The other islands and reefs within Motiti Rohe Moana include Te Porotiti, Te Papa, Okarapu, Motuhaku (Schooner Rocks), Tokeroa and Motunau (Plate Island). Further details are provided in Nepia Ranapia's evidence.

Motiti Whanaketanga

18. I was born and raised on Motiti Island. In 1953, when I was 10 years old, my mother became ill and passed away. As is our custom, my siblings and I were passed on to our grandparents. My sisters and I were raised by our grandparents, Rameka and Te Paekitawhiti Hoete. My brother was passed to our nanny, Harata Riritahi, who raised him amongst the many whāngai that she cared for.

19. Back then, life on Motiti was an existence of its own, with virtually no contact with the outside world: no telephone, no radio, no television. We were taught by our parents, grandparents and the community what they practised on the island. Being brought up on the island by elders gives you particular insights into the way things were done, and why they were done that way. I do not mean to say that we should be stuck in the past, but I do believe that progress becomes easier when you have a proper awareness of where you come from.

A subsistence lifestyle

20. Motiti has always been a place of plenty, and we have always been able to rely on the sea for kai. There were no fridges or anything like that on the island. We lived a subsistence lifestyle, trading for essentials we could not grow or catch ourselves. Everything we ate came off the land (kūmara, potatoes, maize) and from the sea. Both women and men fished, depending on who was available. Some would go off the rocks and some would go out on a dinghy. Men spent most of their time during the day cultivating the land for maize and kūmara, repairing plant and equipment and occasionally going venture boat fishing and rock fishing at night.

21. Historically, it is the wāhine of Motiti that have gathered and hunted the kaimoana. Women would go diving for crayfish, kina and paua at least three times a week, or even daily. This is still the custom on the island today. Back then, they would dive topless; it was all completely natural. However, over time, spearfishing and scuba diving became the preferred method of catching and collecting seafood for both men and women.

22. Seafood was in abundance, we would eat crayfish raw, and even used crayfish for bait. We would put it in fresh water to marinate it, then it would fall out of the shell and we would put it on a hook. We had these relationships to kaimoana and saw them as taonga: snapper, tarakihi, maomao, hapuku, and other fish. Hapuku was on the way out by my childhood, due to overfishing. You could only catch it in certain areas.

23. As children, we were taught how to collect and catch seafood using different methods for day and night, fishing using hand lines, spears and carbide lights at night. I started going out in the waka with my nanny when I was about 10. I was fortunate to have been shown by my grandmother Te Paekitawhiti Hoete, and grandaunt Harata Riritahi, the art of catching crayfish without the use of any dive equipment. This also included ways of collecting other seafood like paua, kina, pupu, nokihihi rock oysters, eels, etc adequate for the table.

The importance of community

24. There are two marae on Motiti, Te Ruakopiha Marae, whose tipuna whare is Tamatea ki te Huatahi and whare kai is Hinewai, and Te Hiinga o Te Rā on Karioi Pā. Te Ruakopiha Marae ended up being used more than Te Hiinga o Te Rā, because the construction of the wharekai (Puna) was never completed. Te Hiinga o Te Rā was frequently used for social occasions and for backup accommodation.

25. When I was growing up on Motiti, the marae and the church were the centre of the community. All the main community events happened, and all necessary decisions were made at the marae. It was a community open to all, and we would talk as a community until a decision was reached. I do not recall many arguments, it was very different then to what it is today. It was a community effort living on Motiti: you had to get on together or you wouldn't survive.

26. There were around 150 people living on Motiti in my time, but it had been up to 200. Communal living is the difference between then and now. Today, everyone is for themselves. The island community operated independently, and the whānau operated independently. From the 1960s, things changed. The migration to the mainland began, because there was no future on the island. Farming was becoming unprofitable. The prices of maize and kūmara dropped, and black rot affected the kūmara harvests. Besides crayfish and kaimoana, these crops were our only – and dominant – source of income. Our ocean economy and lifestyle has subsequently been obliterated by actions of the Crown allowing other

people to extract our fisheries resources to the point of extermination and complete extinguishment of our customary fisheries rights and any ability to benefit from use of the aquatic resources surrounding Motiti.

27. Motiti tangata whenua were not anti-development. Importantly, when we all participated in a development, it could be controlled to maximise the benefit for all those on and of the island. In this way, one family would not use the land in a way that would create hardship for others, or deny them access to particular areas on the island. When you live on an island with finite resources, planning to ensure that others do not miss out is a reality of life.

28. To us, it was equally important to plan for the future as to ensure that actions did not fracture connections to the past. We exercised kaitiakitanga by avoiding the inappropriate development of wāhi tapu and by doing things in accordance with our tikanga. This was guided by knowledge that had been passed down through generations.

Life on Motiti today

29. Today, there are 62 houses on the Maori-owned northern side of the island, but only around 22 of those houses are permanently occupied. There are around 40 adults living on the island, and perhaps a dozen children. The population swells significantly over the summer holiday period, when many people come back to stay on their ancestral land. Whānau return to Motiti in the summer to reconnect. Our mokopuna fish and dive in the fishing spots around Motiti island during this period.

Decision-making

30. While we acknowledge our connections to those on the mainland, in the hundreds of years that our people have occupied Motiti, we have developed an island culture of our own with unique traditions and practices. What should be kept in mind is that rights to land and the moana are associated with the hapū who hold mana whenua, not the iwi

and at times hapū who have separated from the larger iwi polities to establish themselves as iwi in their own right.

31. We do not rely on others in the exercise of mana and we have maintained our independent identity and autonomy as the tangata whenua of Motiti Island. Under our tikanga, we are kaitiaki because we hold the ahi kā. As haukāinga, we know the island and its moana environment intimately, and we are best able to implement and monitor changes.

32. I struggle to understand why many, both in the past and present, have sought to bypass Motiti tangata whenua and make decisions for us or around us. We do not presume to make decisions for those living in Whakatane, Rotorua or Tauranga, so I do not see why they should come and tell us what to do on Motiti. I do not say this to insult others. Decisions as to aquaculture, fisheries, resource management, and anything relating to Motiti and its Rohe Moana are important. While we are grateful for the assistance others might provide, those decisions are quite rightly ours to make.

33. My view of Motiti today is very different to when I was growing up on the island. The whole of Motiti was about sustainable productivity. However, this became more difficult for Māori over time. Today, a few Māori are endeavouring to maintain the land as best as they can. While the general land on Motiti now hosts the largest avocado orchard in the country, much of the Māori land is not utilised in any way and the owners lack the resources and know-how to establish a profitable enterprise on the land.

34. The surrounding waters were a sea of plenty and should have been part of the local economy, but the people considered this more as their food cupboard. Unbeknownst to them, the resources were gradually being depleted by a system only known to the outside world: commercial fishers, cray fishermen, recreational divers etc. Coupled with the lack of monitoring or willingness to understand and make appropriate controls, it has consequently become an environmental disaster.

The **Motiti Rohe Moana** Trust

35. As noted above, the Trust was established on 10 December 2009 to assist with the interests of Motiti tangata whenua. The Trust is a legal vehicle committed to empowering our proud community and increasing our capacity to exercise tino rangatiratanga/self-determination in address the issues related to Motiti rohe/Area of interest.

36. The vision for the Trust traces back to the late Johnny Nuku, who united much of the community around the need to exercise kaitiakitanga and protect the island's marine environment and kaimoana. One of the fundamental objectives of the Trust is to protect and preserve the marine biodiversity, ecological integrity and cultural legacy of the Motiti Rohe Moana, while facilitating compatible use.

37. Five establishment Trustees were appointed. All were kaumātua and kuia who were born and raised on Motiti Island, and who were perceived as "backbones" of the Motiti community.

38. The Trust is an inclusive entity, established to represent all who have whakapapa links to a primary ancestor of Ngā Hapū o Te Moutere o Motiti. Membership is open to all who whakapapa to Motiti, and is not restricted to one hapū or whānau group. The Trustees, as representatives of Ngā Hapū o Te Moutere o Motiti, consider it our responsibility to continue to assert and exercise tino rangatiratanga and kaitiakitanga over the Motiti Rohe Moana:[1]

> *Mā wai rā e tiaki i te moana i te tika me te pono me te aroha ki nga mahi a ngā tūpuna, tuku iho.*

39. The Trust is severely under-resourced with no assets or regular income. We operate on koha and voluntary work and support. This has made it extremely difficult to undertake the many tasks required to address the issues Motiti faces as we rely on people being able to devote their time outside their regular work commitments. It has also been a struggle to

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1 Who will cherish and care for the ocean in accordance with the customs, beliefs and compassion of the ancestors, from long ago.

secure the services of lawyers and other experts needed to act in litigation of the issues both in present proceedings and others.

40. Our financial situation does not impinge on the functioning of the Motiti community on Motiti Island. Motiti has traditionally been a place of abundance and we have relied on the sea for food. The finite resources are managed in a way that benefits the community as a whole, and decisions are made for the benefit of all Motiti tangata whenua.

41. However, increasingly, with each passing day, we are facing the onset of development priorities. Faced with these pressures, the lack of financial resources has meant that we have been unable to engage effectively to develop proper processes of consultation or a regular dialogue between Motiti tangata whenua.

42. Consequently, when the Rena grounded we were ill-equipped to manage the relief process. We consistently found ourselves either ignored, overlooked or rebuffed by various government agencies when we tried to engage them in discussions. There was absolutely no consultation with the Trust.

43. We would like to advance the interests of Motiti tangata whenua by actively pursuing the progression and development of Motiti Island and its marine resources in accordance with tikanga and environmental standards.

44. However, the Regional Council's ongoing failure to recognise or engage with Ngā Hapū has so far prohibited Motiti tangata whenua from such progression and has severely impinged on our ability to advocate and protect the customary rights and interests of Motiti tangata whenua in the coastal environment plan.

45. Since the Trust was established in 2009, our mahi in fulfilling our kaupapa has never stopped. The last eight years have been extremely busy as we have been involved in a number of issues concerning Te Moutere o Motiti:

(a) The development of the first district plan for Motiti proposed by the Minister of Local Government in 2004. This has been an extremely intensive and disruptive process which necessitated a very high degree of input from tangata whenua. The process resulted in appeals which ground through the Environment Court, High Court and then back to the Environment Court and were finally resolved in January 2015.

(b) We have been engaged with the Bay of Plenty Regional Council ("BOPRC") in relation to the Bay of Plenty Regional Policy Statement (RPS) and we were successful in obtaining consent orders on 28 April 2015. However the Council has still to implement these provisions, especially Methods 33 (Collaboration in cma) and 44 (Mauri monitoring methods).

(c) We have also submitted on the Bay of Plenty Proposed Regional Coastal Environment Plan ("RCEP"), and obtained a declaration in the Environment Court that, in short, a regional council may impose controls on fishing techniques and methods provided the sole or dominant purpose of the control was a specified resource management purpose. The Attorney-General appealed to the High Court. Whata J's reasoning accords in many respects with that of the Environment Court.

(d) Motiti ahi kā were also involved as s 274 parties in an RMA appeal concerning resource consent for a track that a general landowner on Motiti wished to construct.

(e) The MV *Rena* disaster on 5 October 2011 was a catastrophe for our island, our people and our rohe moana. We have been deeply involved in the efforts to recover from the effects of the shipwreck. The Crown's machinations in negotiating the agreement to leave the *Rena* on Ōtāiti resulted in us submitting the Wai 2391 claim to the Tribunal, which was heard urgently in 2014, resulting in the *MV* Rena *and Motiti Island Report*. Both prior to and following the wreck of the *Rena*, we have fought to

ensure that the tikanga of Motiti tangata whenua is upheld in the regional and district plans for the area.

(f) In February 2010, we sought recognition of our customary interests under the Foreshore and Seabed Act 2004, however this was adjourned because of the government review of the legislation. In February 2012, we submitted an application to the Crown seeking recognition of the Customary Marine Title that Ngā Hapū o Te Moutere o Motiti hold in relation to the Motiti Rohe Moana. That was declined by the Minister on 17 December 2013, on the basis of the complex customary rights in the area In 2015, we filed an application to the High Court for Customary Marine Title to the Motiti Rohe Moana under the Marine and Coastal Area (Takutai Moana) Act 2011 [CIV-2015-485-767] which was set down in August 2016 for hearing this year, but has since been adjourned by the Crown.

(g) In 2015, we were embroiled in the Regional Council hearings over the application for resource consents to leave the remains of the MV *Rena* on Otaiti. This was made more difficult as we were long forced to battle with the Crown over getting proper resourcing to do this. On 10 August 2015, the Tribunal declined our application for urgency in the Wai 2511 Motiti Island *Rena* Resource Consent Funding Claim.

46. This is an obvious point to make, but all the mahi I have referred to above has been undertaken by us, the ahi kā. The mainland iwi entities do not interfere with Motiti, which is an acknowledgement in itself that we are the tangata whenua/tangata moana. For instance, Te Rūnanga o Ngāi Te Rangi has not involved itself with any Motiti affairs, including the district plan or resource consents.

Motiti Treaty of Waitangi Claims

47. As well as the current Wai 2521 claim, Ngā Hapū o Te Moutere o Motiti have filed the following Treaty of Waitangi claims in the Tribunal:

(a) **Wai 2255**: filed by Peniamina Hoani Aiavao on 29 August 2008 concerning the historical Treaty claims of Ngā Hapū o Te Moutere o Motiti. Jacqueline Haimona, Te Atarangi Sayers and myself were joined as claimants on 31 March 2010;

(b) **Wai 2223**: filed by myself, along with Jacqueline Haimona, and Te Atarangi Sayers on 28 October 2009 on behalf of Ngā Hapū o Te Moutere o Motiti in relation to contemporary Motiti grievances, including in particular the draft district plan for Motiti Island;

(c) **Wai 2391**: filed by myself, along with Graham Hoete and Jacqueline Taro Haimona on behalf of the Trust concerning the MV *Rena* disaster, which was heard on an urgent basis by the Waitangi Tribunal and reported on in the *Report on the MV* Rena *and Motiti Island Claims* released in 2014.

48. We missed the opportunity in having the Waitangi Tribunal inquire into our historical Treaty claims, as they were filed too late to be heard in the Tauranga Moana Inquiry. In relation to the Wai 2255 claim, the Judge advised:[2]

> This claim relates to the Tauranga area. The Tribunal has already held the Tauranga Moana inquiry and issued its stage one report on claims in this area. Stage two is in report writing and it is the Tribunal's intention to include this claim in an appendix to that report. This appendix will list the Wai number, claim name, iwi and hapu identification and major issues only. Inclusion within this appendix does not mean that this claim has been heard or reported on. It is currently unclear how or when the Tribunal will inquire into claims that relate to districts that have already been the subject of a Tribunal inquiry and report. More information will be issued about this when a plan is made.

49. The only option available for us now, if we want to receive a settlement in the foreseeable future, is to enter into direct negotiations with the Crown.

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2 Wai 2255, # 2.1.1.

However, the Crown's interactions with us have removed this possibility of redress.

50. The failure of the Crown to deal with our historical settlement or to promptly enter into settlement negotiations also severely impinged on the Trust's ability to respond to the *Rena* situation.

Lack of engagement with Regional Council

51. Bay of Plenty Regional Council has consistently failed to recognise or engage with Ngā Hapū o Te Moutere o Motiti. We are constantly overlooked. This is most telling in the following examples by both local and central government processes.

Tauranga Moana Iwi Collective Deed

52. The Tauranga Moana Iwi Collective ("TMIC") settlement is with the three mainland Tauranga Moana iwi, namely Ngāi Te Rangi, Ngāti Pūkenga and Ngāti Ranginui, in relation to the Tauranga Moana. The deed of settlement was signed on 21 January 2015 ("the TMIC Deed"), providing redress for all three iwi. We were not initially notified of this settlement.

53. The redress under the TMIC Deed includes the Tauranga Moana Framework ("TMF"), which is a natural resources co-governance regime between iwi and local and central government. The TMF establishes a statutory committee called the Tauranga Moana Governance Group ("TMGG"). No specific provision is made for the ahi kā of Motiti Island in this governance regime. Ngā Hapū o Te Moutere o Motiti does not belong to Ngāi Te Rangi, Ngāti Ranginui or Ngāti Pukenga, and therefore we are not represented on TMGG through the Tauranga Moana iwi.

54. Our concern is that although Motiti Island itself is carved out, the Motiti Rohe Moana is not. Our mana moana extends over a large part of the Moana. As Ngā Hapū o Te Moutere o Motiti is not included on the TMGG, we will not have any say in the arrangements being made for our rohe moana.

55. Our hapū are not recognised as an iwi, and it appears that the Crown has no intention of negotiating a Treaty settlement with us, and therefore we will not meet the definition as it stands.

56. Despite the Minister's waiver of the Crown's "large natural grouping" policy (as is appropriate in our circumstances), the Crown's engagement with Motiti has been inadequate and prejudicial. The Crown has long failed to understand, and still does not understand, who speaks for Motiti. This continues to prejudice our ability to participate.

57. I want to reiterate that we are not against the TMIC Settlement per se, but we strongly object to mainland iwi being given primacy over our Motiti Rohe Moana. I very much hope that Ngā Hapū o Te Moutere o Motiti will also be provided with the opportunity to obtain a co-governance regime over Te Moutere o Motiti and the Motiti Rohe Moana.

Aftermath of the MV Rena *disaster*

58. On 5 October 2011, the containership the MV *Rena* ("the Rena") ran aground on our taonga, Te Tau o Taiti (Ōtāiti). This caused significant pollution from oil, cargo, debris and other contaminants spilling out into a large geographic area, with the most significant damage visited upon Motiti Island, the Motiti Rohe Moana, and the beaches of Papamoa and Mt Maunganui.

59. The tangata whenua of Motiti have been most affected by the Rena wreck. Ōtāiti is a site of high cultural and spiritual significance for us, and a significant traditional fishery. We have commenced our claim for title over it under the Marine and Coastal Area (Takutai Moana) Act 2011. Six years on, our relationships with our ancestral lands, waters and taonga continue to be adversely affected.

60. There is a well-known saying: *Ko Motiti te waka, ko te tau o taiti te haika* – Motiti is the canoe, and Ōtāiti is the anchor. The metaphor has several meanings – physical and spiritual. The anchor is a practical tool. Without the anchor, the canoe is tossed by the ocean. With the anchor, the canoe

can be used to gather kaimoana. An anchor is also a spiritual linkage. On water, it connects us to earth. It grounds us in stormy weather.

61. Another significant saying is: *Ko Ōtāiti te Pito hei hono i nga Hapu o te Moutere o Motiti, ki ona taonga me te Atua.* Ōtāiti is also the umbilical cord. We are connected to our earth mother, Papatūānuku, through the cord. The cord ensures purity. It is uncontaminated. It is the reef where taonga species once lived. As above, so below. Ōtāiti is the toka, the reef. Without it, we lack sustenance.

62. This tragedy put Motiti on the map from the Crown's perspective, but also resulted in mainland iwi swooping in over the top of the island, drowning out our voices. Despite our constant efforts to engage with the relevant decision-makers and resolve this disaster, very little was done to hear our stories. Mainland iwi received the focus.

63. Cultural values assessments were undertaken for Te Arawa, Te Patuwai, and Te Whānau a Tauwhao. These were funded by the Crown, BOPRC and/or the Astrolabe Community Trust (the applicant for resource consent to abandon the remains of the Rena on Ōtāiti). Those assessments dominated the korero on the Rena RMA applications. No-one looked to Motiti. Few, prior to the Wai 2391 hearing, had heard our side of the story.

64. Our claims regarding the Crown's failure to inform and consult on its Rena settlement deeds were determined by the Waitangi Tribunal in the *MV* Rena *and Motiti Island Report*. I will not repeat them at length here. However, the Crown's conduct towards Ngā Hapū in the aftermath of this marine disaster, in breach of Treaty principles, illustrates a long pattern of prejudicial non-recognition of, and non-engagement with, Motiti.

65. As an example of this prejudice, the Trust was not consulted in the Ministry for the Environment's (MfE) development of the Rena Long-term Environmental Recovery Plan ("the Rena Plan"). This plan had obvious and significant implications for the Motiti Rohe Moana and tangata whenua. Had we been consulted, the Trust could have advocated for and

protected the customary rights and interests of Motiti tangata whenua relating to the Motiti Rohe Moana.

66. Instead, the Director of Operations for MfE, Martyn Pinckard, refused to engage with the Trust on the basis that all relevant iwi were being consulted via the Tauranga Moana Iwi Leaders Forum ("Iwi Leaders Forum"), and that a Motiti representative had been appointed. This Forum was established to allow consultation with and the participation of Māori in the *Rena* recovery process. The composition of the Iwi Leaders Forum in effect gave Tauranga Moana iwi the mana, and left Motiti with a minority say (one seat) in what was happening right on our doorstep.

67. Another example of the Crown recognising Tauranga Moana iwi, while overlooking Motiti, is the Ministry for Primary Industries' ("MPI") response to our application under s 186A of the Fisheries Act 1996. On 25 January 2016, for and on behalf of Nga Hapu o te Moutere o Motiti, the MRMT applied for the temporary closure of the fishery around Ōtāiti. I signed the application, along with Te Atarangi Sayers, co-ordinator of Te Tau o Taiti Rahui. A copy of the application is annexed to my evidence to the Declaration hearing attached to this Statement.

68. As kaitiaki, we have long noticed the depletion of fish stock and taonga from the area through over-fishing. The Rena grounding put already threatened species under more stress, with the release of contaminants and pollution into the sea. For our taonga species to return, we need marine protection of Ōtāiti. Because of the Rena, no fishing was allowed at Ōtāiti for five years. Consequently, there was a gradual re-emergence of marine species. Nature began to restore itself. Potential for good came from the bad.

69. Accordingly, in our role as kaitiaki, we made the s 186A application to protect and sustain the reef post-Rena. The reef needs time to heal and rest so that it can re-emerge to its full health. And we cannot exercise customary authority or undertake cultural practices when there are no fish to catch.

70. In his decision of 9 June 2017, the Minister for Primary Industries stated that Tauranga Moana iwi were the recognised tangata whenua, as the proposed closure area is within their gazetted rohe moana. These iwi did not unanimously support the proposed closure. He also said that "no other group has shown that they represent a hapū or iwi which is tangata whenua who can also exercise non-commercial fishing rights in the area". On this basis, the Minister declined to impose a temporary closure. I attach as **ANNEXURE B** the Minister's letter.

71. However, as a result of our struggle to have the Crown recognise our mana moana, the Environment Court has recently acknowledged Motiti ahi kā:[3]

> In contemporary times, the descendants of Ngāi Te Hapū have ahi kā rights at Motiti, including kaitiakitanga responsibilities and customary use rights. They have, without doubt, established mana whenua over their lands on Motiti and mana moana over Ōtāiti.

72. The Environment Court concluded that Ngāi Te Hapū – Te Patuwai and Te Whānau a Tauwhao are tangata whenua of Motiti, and therefore are the kaitiaki of Ōtāiti, with direct mana whenua over Motiti and its associated islands and reefs.[4] The Environment Court's finding was based on the recognition of our tangata whenua status by all parties and witnesses appearing before the Court. It was also based on our ancestral connections, continuous occupation, proximity to the reef, the nature of our cultural and customary associations with the reef, our traditional use of the area as a fishing ground, and the manner in which we have exercised our kaitiakitanga including through the use of tikanga, and our customary values and practices pre- and post- the Rena disaster.[5]

73. From this, the Environment Court held it logically follows that Ngāi Te Hapū – Te Patuwai and Te Whānau a Tauwhao have the right to exercise

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3 *Ngāi Te Hapū Incorporated v Bay of Plenty Regional Council* [2017] NZEnvC 73 at [54].
4 At [84].
5 At [85].

rangatiratanga or customary authority over the reef. This position was unchallenged regarding Motiti and Ōtāiti.[6] As the Court held, our tikanga should thus be applied to Ōtāiti and we should hold the numerical majority of any Kaitiaki Reference Group if resource consent were granted to abandon the Rena wreck.[7]

74. For its part, the Environment Court saw the potential to explicitly recognise and provide for our relationship with Ōtāiti and the rohe moana as "a potential positive benefit of the granting of consent".[8] The Court was therefore aware of the importance of acknowledging our identity as tangata whenua with mana whenua, mana moana, and the attendant duties of *kaitiakitanga*.

75. The Crown still has not formally responded to the recommendations of the Tribunal in the WAI 2391 Rena Report. We sought a response from OTS, but they told us that they were only responsible for historic Treaty claims, and that the report fell within the Ministry of Transport's role. No formal response has been received and nothing is being done.

Failure to provide or support infrastructure

76. The Crown has neglected Motiti Island and failed to provide infrastructure or even the most rudimentary civic works. There is no public infrastructure on the island at all, apart from a telephone exchange. There is no public jetty, no public airstrip, no water reticulation, no electricity, no sewage disposal, no rubbish collection. As Motiti Island is completely privately owned, we have had to provide our own access routes to and around the island. We are completely responsible for providing for ourselves. Some sort of settlement is necessary to resolve these problems.

77. To be fair, tangata whenua have not welcomed Crown intervention – our people have historically acted autonomously and exercised mana

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6 At [86].
7 At [93].
8 At [325] – [331].

motuhake over the island and Rohe Moana. However, I think that the Crown's effective assertion of control through the District Plan, as well as the RMA and fisheries legislation that affects us means that it is no longer viable not to engage. I also think that we cannot realistically realise our aspirations for the island without resources. The Māori land is lying fallow and not providing any return for the owners.

Waahi Tapu and Waahi Taonga

78. Motiti has always exercised an understanding of the importance of relationship to space and place in the marine environment. Our people are navigators of the rohe and traded significantly along the coast of the Te moana o Toi / Bay of Plenty and beyond. We understand the importance of tapu and taonga.

79. It is important that we have a method of expressing these in our shared marine space so that others can share that understanding too.

(a) Waahi tapu is a very sacred place that has been made so by strong forces usually involving death and sacrifice. It is of this purpose that we don't tread on these areas and allow the mauri life force to be strongest.

(b) Waahi Taonga represents the importance of a relationship with a treasure of our moana. It shares that treasure with us as we respect that its life force is as important as ours. We give an appreciation for this relationship by preserving the connective mauri life force it provides.

80. These concepts are not foreign but shared by most indigenous people. Our community exercise these values when we visit such places that have significant meaning to us and when we have a relationship people will respect the importance it provides for everyone.

81. By recognising these values and providing rules to support them in the coastal environment plan, we will begin to restore the mauri and life force of the Motiti rohe moana.

Conclusion

82. It is devastating to think that our generation will be remembered for the loss of mana over our taonga, Te Moutere o Motiti. In my lifetime, I have witnessed the erosion of tangata whenua presence on the island, as we have had to accommodate the economic aspirations of others. This erosion continues, and I fear that our presence as Motiti tangata whenua will irreversibly diminish as our mokopuna are forced away from our ukaipo (sustaining place of origin) by the discord and alienation resulting from the Crown's policies towards us.

83. Our mokopuna will not have the privileges of growing on and being sustained by the island. The connections that they will assert will become mere abstract interpretations of the stories they were told while growing up. In this way, the historic reality of our Māoritanga, our customs, and our very identity will become mythology – not lived, but asserted from afar.

84. We have turned to the Environment Court for assistance because we do not know how else to secure recognition and protection of Māori and biodiversity values that go beyond the activity of fishing which is provided for in the Fisheries Act. We have attempted to reach out to the Crown and MPI in good faith through the processes of S186A but got nowhere due to the values we express are not for the purposes of fishing under the Fisheries Act. We have been continually fobbed off by these agencies and Bay of Plenty Regional Council in their duty to protect these provisions and duties for the wellbeing of the community.

85. We do not fit neatly under any iwi. We are not regarded as a "large, natural grouping" in our own right. Although the senior Managers have made repeated assurances of continued official engagement to address these matters we have brought up in a new working relationship which fails to recognise that the environmental degradation is occurring or provide a means to addressing them which are within their authority.

86. Coastal Planning need to have consideration of the Maori values of Waahi Tapu and Waahi Taonga and that the Activity provisions and rules appropriately reflect the cultural sensitivity of these areas.

87. We are tired of battling to get traction and not making progress. The issues I have raised are all urgent and the prejudice will be irreversible. We believe that the future of Te Moutere o Motiti is at stake. We support the proposed provisions set out in Graeme Lawrence's planning evidence.

Dated this 25th day of October 2017

_____

Umuhuri Matehaere

UNDER	the Resource Management Act 1991 (the Act)
IN THE MATTER OF	appeals against to the Bay of Plenty Regional Council Proposed Coastal Environment Plan
BETWEEN	**Ngati Makino Heritage Trust** **ENV-2015-AKL-000140**
AND	**Various** **Section 274 RMA Parties**
AND	**BAY OF PLENTY REGIONAL COUNCIL**
	Respondent

STATEMENT OF EVIDENCE OF UMUHURI MATEHAERE ON BEHALF OF MOTITI ROHE MOANA TRUST

Dated 06 November 2016

Counsel Acting:
Rob Enright
Barrister
Northern Steamship Chambers
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Britomart 1010
e: rob@publiclaw9.com
m: +64 21 276 5787

1 I am a trustee and Chairman of the Motiti Rohe Moana Trust. I am authorized to provide this affidavit on behalf of the Trust (MRMT).

2 I am of Ngāi Te Hapu, Te Patuwai, Ngāti Makerewai, Ngāti Takahanga, Ngāti Pukenga, Ngāi Tauwhao and Ngāti Whakahemo descent.

3 I was born and raised on Motiti Island. My family has long and deep connections to the island and we continue to play integral roles within the Motiti community. In our tikanga, the kaitiaki are the people who hold the ahi kā. We are the haukāinga and it is we who know the island and its environment intimately. We have maintained our relationships with our moutere, keeping our identity alive - Mā Motiti, mō Motiti [By Motiti, for Motiti].

4 As island people we were reliant on the ocean that surrounds us, and our rohe moana extends over the ocean and the nearby toka (reefs) and motu (islets). Motiti has always been a place of abundance and we have always relied on the sea for food. Nga tini a Tangaroa (the descendants of Tangaroa) are taonga to nga hapu o te moutere o Motiti.

5 MRMT is a s274 party to the Ngāti Makino Heritage Trust appeal. MRMT supports all of the relief sought by Ngāti Makino. My evidence comments on specific relief sought in that appeal, as follows:

> New Policy
>
> Protect the habitats of species in the CMA that are important for commercial, recreational, traditional or cultural reasons from the adverse effects of use and development.
>
> Add a new Objective X: "Support the planning involved with, and the application of, particular marine spatial tools in the management and protection of the marine area."
>
> Provide for strategic spatial planning to support the use, activities and development needs and aspirations of iwi Māori in the coastal environment.

6 MRMT supports the protection of taonga areas and species in the coastal environment. This is part of our role as kaitiaki. We believe that protection is best achieved through spatial identification of taonga areas and species in the coastal plan, and use of methods that have teeth and can protect our relationships with our areas and species. This includes the use of rāhui to protect those relationships. I have previously provided evidence on the use of rāhui as a resource management tool to protect the relationship of Māori with Tangaroa, moana and taonga species. Rather than repeat that evidence, I adopt my affidavit evidence, produced as Annexure UM1. The Trust has separately applied for a declaration in relation to the legality of rāhui as a method in the coastal plan.

7 I produce as **Annexure UM2** a paper called *Reporting Environmental Impacts on Te Ao Māori*. This paper confirms the importance of spatial definition – "know where it is" (p55).

> Involve iwi Māori in the development of criteria, attributes and assessment frameworks to incorporate matauranga in the assessment of IBDAs, natural character, natural features and landscapes and ASCV, and in the assessment of extent of effects of activities on these matters.
>
> Add a new policy requiring identification and protection of regionally significant and/or representative cultural landscapes, landforms and features of importance to iwi Māori.
>
> Involve iwi Māori in the development of frameworks for the identification, categorisation of areas, features and/or characteristics of importance; and work together to formulate mechanisms to protect these places, features and/or characteristics from inappropriate use or development in the CMA.

8 Annexure UM3 is a paper called *Indigenous Māori knowledge and perspectives of ecosystems*. This paper identifies that:

> "There is no single Māori word or translation for ecosystem or ecosystem services, but matauranga Māori (Māori knowledge), te reo Māori (Māori language) and whakapapa (ancestral lineage) are used together to unlock the indigenous perspective and understand what an ecosystem is, and its components and functional units.

> Māori see the declining area and condition of natural ecosystems and the services that they provide as significant and challenging..For Māori this widespread degradation is manifest through declining areal extent and quality of customary resources, and increasing difficulty in accessing such resources. For Māori, as with other indigenous cultures, there are clear links between healthy ecosystems (with greater life-supporting capacity) and people's cultural and spiritual well-being. There is a realization that most ecosystems require a diversity of life forms to exist and function properly..and to sustain the services provided by ecosystems." (p274)

9 I tautoko (support) this statement. It is important to identify the area that is to be protected. The area needs to be able to sustain the biodiversity of Tangaroa. Tangata whenua are best placed to identify areas and taonga species that are of importance to us. Our approach is to take a holistic approach to cultural landscapes. This includes the seen (physical) and unseen (spiritual, te Ao) elements of the environment.

10 Di Lucas in her evidence provides more information on this holistic approach to cultural landscapes. MRMT has faced continual difficulties in getting our relationships, sites and taonga species recognized by the Council in its coastal plan. The Regional Policy Statement recognizes the Motiti Natural Environment Management Area, which includes many of our key sites and taonga species. We now seek that recognition, for Motiti but also for tangata whenua generally, within the coastal plan. We also seek rules and methods to maintain and protect these values and biodiversity.

> Amend Policy NH 3 to include proposals for activities that can demonstrate positive benefits for iwi Māori that offset adverse effects (such as development of kaitiakitanga capabilities; Restoration of cultural landscape features; Growth and application of matauranga Māori of the area and its landscapes, ecosystems, biodiversity etc.)
>
> Add a new Objective X: "Support the aspirations of iwi Māori in the sustainable use and development in the coastal environment."

11 The Coastal Plan should encourage mitigation and offsetting that has tangible, practical benefits to biodiversity, our taonga species and areas. Dr Roger Grace has provided examples of the types of offsetting mechanisms that can have practical impacts. Tangata whenua need to be directly involved in the areas identified for mitigation and offsetting. Solutions should not be imposed on us without opportunity

for input. For example, locations that are appropriate for seeding new mussel beds, or no-take areas that offset areas used for commercial benefits.

> Include a framework to promote delegations and transfer of powers under the RMA and/or support iwi Māori aspirations toward the transfer and/or delegation of RMA functions, powers or duties in relation to the management of those characteristics identified in the CMA as being of special value to them.

12 Tangata whenua are excluded from decision-making processes that affect our taonga areas and species. Our role as kaitiaki is prevented, if we cannot exercise authority over our areas and species. We support better engagement by Council with all Māori. This must include hapu as well as iwi authorities. The pre-colonial and post colonization history of the Bay of Plenty is complex. Council needs to resource its engagement with iwi and hapu, recognizing that there are many groupings as a result of these historical processes. Hugh Sayers in his evidence provides greater details of the difficulties that MRMT has encountered in attempting to build relationships with Council. Our kaupapa (role) is to protect our relationships with, and the wellbeing of, taonga species and areas, and the biodiversity of Tangaroa. Council should be encouraging this role, not frustrating it. **Annexure UM2** is my affidavit provided on behalf of the New Zealand Māori Council to the Waitangi Tribunal National Freshwater and Geothermal Resources Inquiry, WAI2358. This illustrates why we need better co-management structures and opportunities for co-governance in the coastal environment. Rules should not be imposed on us from the mainland; and decisions about Motiti and Motiti rohe moana, should be made with input from the tangata whenua of the island. As Ngā Hapu o Te Moutere o Motiti are not included on the Tauranga Moana Governance Group, we are largely or wholly excluded from any say in the co-governance and co-management arrangements for our rohe moana.

Dated this 6th day of November 2016

Umuhuri Matehaere

Chairman, Motiti Rohe Moana Trust

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

AFFIDAVIT OF UMUHURI MATEHAERE IN REPLY
(ON BEHALF OF MOTITI ROHE MOANA TRUST)

1st November 2016

Counsel Acting:
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Barrister
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m: +64 21 276 5787

I, Umuhuri Matehaere of Tauranga, chairman, swear:

1 I am a trustee and Chairman of the Motiti Rohe Moana Trust. I am authorized to provide this affidavit on behalf of the Trust.

2 I am of Ngāi Te Hapu, Te Patuwai, Ngāti Makerewai, Ngāti Takahanga, Ngāti Pukenga, Ngāi Tauwhao and Ngāti Whakahemo descent.

3 I was born and raised on Motiti Island. My family has long and deep connections to the island and we continue to play integral roles within the Motiti community. In our tikanga, the kaitiaki are the people who hold the ahi kā. We are the haukāinga and it is we who know the island and its environment intimately. We have maintained our relationships with our moutere, keeping our identity alive - *Mā Motiti, mō Motiti* [By Motiti, for Motiti].

4 As island people we were reliant on the ocean that surrounds us, and our rohe moana extends over the ocean and the nearby toka (reefs) and motu (islets). Motiti has always been a place of abundance and we have always relied on the sea for food. Nga tini a Tangaroa (the descendants of Tangaroa) are taonga to nga hapu o te moutere o Motiti.

5 This affidavit is in response to affidavit evidence filed by

a. Joanne Barbara Noble on behalf of Bay of Plenty Regional Council;

b. Tania Barbara Cameron on behalf of the Attorney-General

6 The following points are made in reply:

Affidavit of Joanne Noble

7 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."

8 Rāhui is a planning and resource management tool, used from ancient times to the present. Rāhui is part of our role as kaitiaki. It maintains our relationship with the biodiversity of Tangaroa, our native flora and fauna, and our taonga areas and species. I tautoko (support and adopt) the affidavit evidence of Nepia Ranapia dated 19 August 2016 on these matters. We seek to rely on the tool of law (*te rakau ture*), through the Resource Management Act 1991, to protect our relationships with our moana and taonga. We see this as part of the duty for active protection under the principles of te Tiriti o Waitangi.

9 The trustees of the Motiti Rohe Moana Trust (**MRMT**) have prepared a draft Motiti Rohe Moana Customary Fisheries Plan, in relation to the future protection and preservation of native flora and fauna in the coastal marine area. This is **Annexure "UM1"**. **Annexure "UM2"** is a detailed map outlining the Ancient Fishing Grounds and Shell Fish Gathering of Ngati te Hapu. This was prepared by Nepia Ranapia. **Annexure "UM3"** is an extract from our s186A Fisheries Act application for temporary closure of Te Tai o Taiti / Astrolabe Reef. It outlines the devastating lack of hapuku stock remaining in the Bay of Plenty. The hapuku is a taonga species, once reserved for our tohunga. It is not possible to have a relationship with a taonga species fished out of existence. The same applies to the tamure (snapper) and koura (crayfish) and our other taonga species, identified in Annexure "UM1" (refer page 9). **Annexure "UM4"** is an extract from *Motiti Island* by A H Matheson (1979). This demonstrates conclusively how much biodiversity we have lost since colonization. We believe the RMA 1991 can maintain and protect biodiversity, and restore our ancestral and contemporary relationships with our moana and taonga, through the use of rāhui.

Affidavit of Tania Cameron

10 The s186A Fisheries Act application for temporary closure of Te Tau o Taiti reef (annexed to Ms Cameron's affidavit marked "TBC-1") was lodged with the Minister and MPI on 25 January 2016, however the first meeting with MPI officials only occurred on 13 June 2016 at a Hui of all Bay of Plenty iwi representatives (referred to at paragraph 13 of her affidavit) at which no-one objected to a rāhui over the area. Issues raised were of a 'mana-mana' nature concerning 'who' should properly make such an application. These are not matters for this Court.

11 At paragraph 12 of her affidavit Ms Cameron states that "50 submissions oppose the proposed closure". Ms Cameron provides no breakdown or analysis of this opposition which includes mainland iwi groups and other interests that conditionally support rāhui /closure but want the application changed to their names.

Rahui resource management method

12 Annexure "UM5" are extracts from the recently notified RPS Plan Change 3 for Rangitaiki River. The Council has recognized rāhui as a method for protection and restoration of tuna (Method 23F) and "*advocate for termination of commercial tuna harvesting within the Rangitaiki catchment*" (Method 23G).

13 We support use of rāhui in this way. However, there appears to be a double standard applying to some Maori, but not to others. The issues raised by Ms Noble in paragraphs 11 and following are no different to matters which the Council must have considered in promulgating RPS Change 3.

14 Clearly different approaches and standards are being applied by BOPRC which we are uncomfortable with, both in Council responses to NPSFM 2014 compared to NZCPS 2010, and in respect to how and when Council engages with tangata whenua under RMA.

15 The trustees of MRMT are well respected 'born and bred' kaumatua and kuia of Motiti and we refute any suggestion to the opposite effect by Te Patuwai Tribal Committee and Te Runanga o Ngati Awa in this proceeding and we note the Court recorded in its Decision [2012] NZEnvC 282 at paragraph [15].

16 Should there be continuing dispute about recognition and identity issues relevant to matters before the Environment Court then these matters should properly be referred to the Waitangi Tribunal for determination and resolution between the Crown and parties.

17 Now the real issue MRMT trustees are concerned with concern NZCPS directives to address matauranga Maori and our relationship with taonga species within our rohe and how we can exercise kaitiakitanga (s7(a) RMA) to protect our relationships.

18 Fundamentally in order to keep natural places natural, there needs to be protected places that are not degraded by human activities and to keep those places as it was, and allow our ability to practice our culture and restrict over extraction or over-use.

19 Our experience has been of lack of responsible management by Crown agencies and the regional authorities who appear to lack the tools to make good management decisions or comprehend the inter-connected nature of the coastal marine environment.

20 What is clearly required is for the pRCEP to extend the precedent set by the proposed RPS Change 3 (Rangitaiki River) and (ultimately) address the issues identified in our (MRMT's) appeal.

Sworn at Tauranga)
This 1st day of November)
2016 before) Umuhuri Matehaere

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

J.H. Hiini
Deputy Registrar
District Court
Tauranga

Motiti Rohe Moana Draft Customary Fisheries Plan 2015 - 2020

Motiti Island from North towards mainland Bay of Plenty coast

Protect **Preserve** **Provide**

Nga Hapu o Te Moutere o Motiti

Rohemoana@gmail.com

Kaupapa

"Tiakina i nga rawa hi ika, a tatau kaimoana mo nga uri whakaeke"

Protecting Motiti fisheries for future generations

Ma Motiti Mo Motiti

This is the exhibit marked with the letter UMI referred to in paragraph 9 of the annexed Affidavit of UMUHURI MATEHAERE sworn at TAURANGA this 1ST day of NOVEMBER 2016 before me:

J.H. Hiini
Deputy Registrar
District Court
Tauranga

Deputy Registrar

Contents

A: Motiti Rohe Moana Customary Fisheries Plan 2015-2020

B: Motiti marine spatial planning & marine protected areas

C: Appendices

Ma Motiti Mo Motiti

Summary

Motiti Customary Fisheries Management Objectives

"Protect Preserve & Provide"

1. Taonga fisheries restored, preserved and protected for future generations.
2. Collaborative partnerships
3. Capacity development to meet responsibilities as *Kaitiaki*
4. Customary fisheries are healthy, sustainable and support the cultural wellbeing of community
5. Fisheries are sustainable to support economic future wellbeing

Te Moutere o Motiti from SW Horopupu reef Taumaihi Island

Ma Motiti Mo Motiti

Our Mission: is to conserve, protect and enhance the biological diversity, ecological integrity and cultural legacy of the Motiti Rohemoana while facilitating compatible use.

Purpose: Motiti Rohemoana Natural Environment Area Management Plan

1. Describe regulations and boundaries
2. Outline organisation
3. Set priorities Goals and performance measures for programmes & activities
4. Guide development of future management activities

State of the Rohemoana reports

- Resources and Uses of the Motiti Rohemoana
- Characteristics and assessment of resource status and habitats
- History of marine species population data & Fish ecology

Motiti Rohemoana Alive programme

Goal: To increase awareness of Motiti Rohemoana

Key natural and cultural resources

Environmental Conditions

Geology
Bathymetry
Oceanography

Natural Resources Data

Phytoplankton
Zooplankton
Benthic Organisms
Fishes
Marine mammals
Seabirds

Historical and Cultural Resources

Management for Resource Protection & Research

Motiti Natural Environment Area - Regional Coastal Environment Management Plan

Management for Human Activities

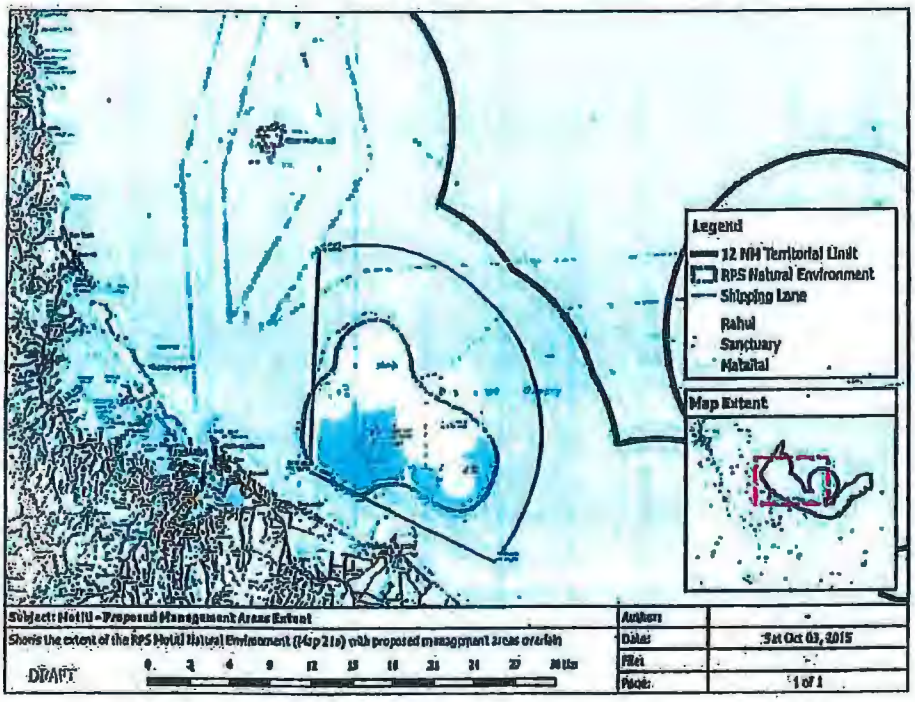
Rena information links

Ma Motiti Mo Motiti

Purpose

The purpose of this Customary Fisheries and Marine Management Plan is to support decision-making processes for the integrated resource management of the Motiti Rohemoana Natural Environment Area.

This Plan is designed to inform customary fisheries objectives for the period 2015-2020.



Objectives

Use Outcomes

All fisheries resources of Motiti Rohemoana are used in a manner that provides the optimum sustainable cultural, social and commercial benefits to hapu and whanau.

Environmental Outcome

The capacity and integrity of the biological and physical environment are managed in a sustainable way and to a level that provides for the growth and wellbeing of all the communities it supports, while reflecting the cultural aspiration of Motiti tangata whenua, tangata moana.

Ma Motiti Mo Motiti

Management Outcomes

Together Motiti Collective and other stakeholders to ensure that appropriate decisions are taken to manage the fisheries resources effectively and sustainably.

1. Objective 1 - Protect, Preserve, Provide
2. Objective 2 - Collaboration management
3. Objective 3 - Kaitiakitanga
4. Objective 4 - Customary sustainability
5. Objective 5 - Economic sustainability

Management Objecive 1 - Protect, Preserve and Provide

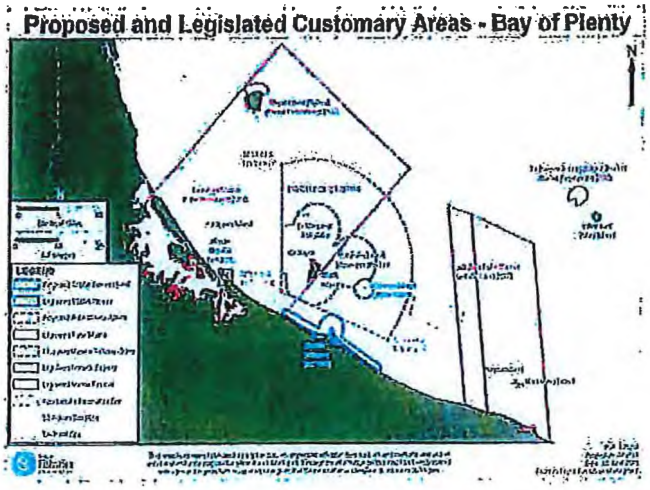
Mana and Rangatiratanga over Motiti Rohemoana is restored, preserved and protected to ensure provision of customary & recreational fisheries resources for future generations

Performance Measures

1. Fisheries habitat and species are protected preserved and enhanced

2. Motiti Collective contribute to decision-making about fisheries and habitats through Ministry supported iwi-led research

3.Tikanga related to fishing practices and environmental standards are preserved through strong participation and education of whanau to guide future fisheries managers



4.Motiti Collective environmental managers are supported across agencies to ensure that environmental standards and policies are implemented in a way that promotes healthy fisheries

5. Motiti Collective are assisting to engage in proactive decision-making processes across agencies where economic resource development and ventures can be investigated for the betterment of Motiti Rohemoana fisheries and habitat, and to future proof management rights

6. Customary Marine Title recognition

Management Objective 2 - Collaboration Management

Collaborative partnerships in fisheries and environmental resource management are realised

Performance measures

1. Motiti Collective individually and also collectively with other iwi, can participate in investment and growth initiatives of fisheries opportunities where viable

2.Undertake a collaborative approach to implement fisheries regulations within the Motiti rohemoana and in other processes that are identified as necessary

3.Motiti Collective are able to openly engage and share relevant fisheries information, systems and possible expertise when coordinating management planning processes within Ministry and iwi fisheries frameworks

Management Objective 3 - Kaitakitanga

Motiti Collective to have sufficient capacity to meet their individual and collective responsibilities as *Kaitiaki* in partnership with others

Performance measures

1. Fisheries Monitoring strategy within Motiti rohemoana

2. Fisheries Act s186A Closure application

3. Establishment and development of Motiti rohemoana Kaitiaki programme

Management Objective 4 - Customary sustainability

Our Customary non-commercial fisheries are healthy, sustainable and support the cultural wellbeing of Motiti rohemoana

Ma Motiti Mo Motiti

Performance measures

1. Mataitai establishment process and application

2. Increase recording and collection of data at significant customary sites

3. Promote Kaitiaki programme and sustainable practices

Management Objective 5 - Economic Sustainability

Our commercial fisheries are sustainable and support the economic wellbeing of Motiti rohemoana

Performance measures

1.Engagement with MPI and its partnerships with other fishing industry players is able to benefit from the optimum value for core commercial stocks

2. Engagement with MBIE to explore feasibilities for economic developments within the rohemoana

3. Innovations in commercial fisheries (aquaculture, research and technology, new business) are explored and adopted where viable

Management Framework

<table>
<tr><td colspan="4">Ministry of Primary Industries - Fisheries</td></tr>
<tr><td colspan="4">Motiti Marine Forum - Kaitiaki & Stakeholders</td></tr>
<tr><td>Maori</td><td>Recreational</td><td>Commercial</td><td>Environmental Groups</td></tr>
<tr><td colspan="2">Science R&D</td><td colspan="2">Zone Use designations</td><td>Permits, access</td></tr>
<tr><td colspan="4">Environmental response</td></tr>
<tr><td colspan="4">Community and Tangata whenua benefits</td></tr>
</table>

Customary Fisheries Stock

[MPI customary fisheries report Tauranga moana]

Customary fisheries were examined in a feasibility report, and engagement of customary fisheries management in the Bay of Plenty area.

Motiti has specific and shared culturally important species considered taonga to the people of Motiti.

Taonga Species

Taonga Species are of the utmost importance to tangata whenua (Table 1). These species have seen a substantial decline as they are shared with commercial interest. A case study into highlights the decline of customary resources in the Bay of Plenty (Boyd, 2015).

Table 1: Taonga Species important to tangata whenua of Motiti (Francis, 2012)

Maori Name	Scientific Name	Common Name
Haku	*Seriola lalandi*	Kingfish
Kahawai	*Arripis trutta*	Kahawai
Tamure	*Pagrus auratus*	Snapper
Araara	*Pseudocaranx georgianus*	Trevally
Tarakihi	*Nemadactylus macropterus*	Tarakihi
Maomao	*Scorpis violacea*	Blue Maomao
Parore	*Odax Spp*	Butterfish
Hapuka	*Polyprion oxygenelos*	Groper
	Polyprion americanus	Bass
Whai	*Myliobatis tenuicaudatus*	Stingray
Pioke	*Mustelus lenticulatus*	Rig shark, Lemon shark
Takeke	*Hyporhamphus ihi*	Piper
Wheke		Octopus
Koura		Crayfish
Tupa		Scallops
Kuku, kutai		Mussels
Kina		Sea urchin
Pūpū		Whelk, cats' eye, winkle
Paua		Abalone

Information and decision-making frameworks

Motiti Rohemoana Trust Purpose 2009
Environmental Assessment 2015
Fish Stock Assessment 2015

⇩

Fisheries and marine management Plan

⇩

Engagement of stakeholders

⇩

Motiti Marine Forum

⇩

s186 Fisheries Act	Resource Management Act	Conservation Act Marine reserves & MPAs Act review	MBIE
⇩	⇩	⇩	⇩
Mataitai Customary fisheries reserve	Marine spatial Plan	Marine Protection Area	Economic development Area
⇩	⇩	⇩	⇩
Customary and recreational areas	Motiti Natural Environment Area	No-Take Marine Area	Halo fishing area and AMA
⇩	⇩	⇩	⇩

Monitoring

⇩

Motiti Marine Forum

Ma Motiti Mo Motiti

Information sources

Motiti Rohemoana Trust Purpose 2009

Environmental Assessment 2015

Fish Stock Assessment 2015

Wai 2391 Motiti Island - Rena Report 2014

Wai 2521 Nga Hapu o te Moutere o Motiti Claim 2015

Customary Marine Title Application [CIV-2015-485-767]

s186A Temporary Closure Application

Mataitai Reserve Proposal

MPA proposal

Marine sanctuary Proposal

Motiti Marine Forum Charter

NABIS

Motiti Rohemoana Stakeholder relationships

Maori

Motiti Island

- Motiti Marae Committee
- Te Patuwai ki Motiti
- Motiti Environment Management Society Inc.
- Ngai te Hapu Inc.

Mainland

- Te Arawa ki tai Trust
- Tauranga Moana Iwi Collective

Government

Local and territorial

- Department of Internal Affairs - Offshore Islands
- Bay of Plenty Regional Council
- Tauranga Harbour Master

Central

- Ministry for Environment
- Department of Conservation
- Ministry of Primary Industries
  - [Motiti Rohemoana Trust does not have a formal engagement with MPI]
- Ministry of Business, Innovation and Employment

Commercial

Fishing Industry

- Sanfords
- Moana Pacific
- Cray fishers
- Local fishers

Tourism Industry

- Dive zone Tauranga
- Charter fishers
- Dolphin experience
- Tourism Bay of Plenty

Community/Public

- Legasea
- Recreational Fishing Clubs
- Charter Fishing Association
- Recreational Dive Association
- Forest and Bird
- Friends of The Bay

Science Institutions and Universities

- University of Waikato
- University of Auckland
- NIWA
- Cawthron Institute

References

The following documents were reviewed in preparation of this Customary Fisheries Plan:

Marine Reserves, The Public Trust Doctrine and Intergenerational Equity (Christie, 2004)

Marine Protection Areas (Fisheries & Conservation, 2008)

Safeguarding Our Oceans (Kate Mulcahy, 2012)

Future Seas: Scenario Planning and the Establishment of a Marine Reserve Network (URS, 2009)

Draft National inshore Fisheries Plan (MPI, 2011)

Integrated Management of New Zealand Coasts: Challenge and prospects (Peart, 2008)

Feasibility study for assessment of customary harvest by Kaitiaki in the Te Tai Hauāuru and Tauranga Moana Regions (Kawe, 2014)

Fisheries and Ecological Effects of the proposal for Leaving the Wreck of MV Rena (White, 2013)

Natural Character Assessment: Proposal to leave the remains of the MV Rena on Astrolabe Reef (Robertson, 2014)

Astrolabe Reef Metocean Conditions: Wave, Ocean Current and Wind (Metocean, 2013)

Benthic Sediment Quality Report - Astrolabe Reef (Don, White, West, & Bell, 2013)

Review of sustainability and other management controls for snapper 1 (SNA 1) (MPI, Review of sustainability and other management controls for snapper 1, 2013)

Biodiversity Conservation (Costello & Ballantine, 2014)

Ma Motiti Mo Motiti

MOTITI
ROHE MOANA

B: Proposed Motiti Marine Spatial Planning - marine protected areas (MPAs)

Te Huruhi Bay, Motupatiki & Turitea Island - eastern Motiti Island

Application of applied marine spatial environmental planning at regional planning level will provide a structural framework overlay for a multi-use marine management regime.

Motiti is a unique marine space as it is an offshore island with oceanic influences in relative close proximity to the Bay of Plenty coast.

Use management regime

Diverse uses

Biodiversity protection

Mā Motiti Mo Motiti

Non-Take Marine protection area

Provide for ecosystem recovery post Rena - Rahui

Te Tau o Taiti (Astrolabe) reef

Marine Environment sanctuary

Provide ecosystems protection measure to enhance biodiversity

Schooner rock/Plate Island

Customary use area - Maitaitai reserve

Provide for sustainable customary use

Motiti Island

Recreational Use areas - Recreational fishing sanctuary

Provide managed and monitored area to best provide for recreational fishing.

Okarapu (Okaparu, *sic*) Reef

Commercial Fishing protection halo - economic offset

Provide Sustainable economic fisheries resources on the fringe of the MPA'S

Penguin shoals

MPA	Area proximity	Provide for	Govt agency
Full Protection Marine Reserve	3 Nm around Astrolabe reef	biodiversity enhancement	DoC
Marine Environment sanctuary	3Nm around Schooner rock and Plate Island	Provide ecosystems protection measure	MPI DoC
Customary use area - Maitaitai	1 Nm around Motiti Island	sustainable customary use	MPI
Recreational Use areas - Recreational fishing sanctuary - Mataitai	Okarapu Reef and 3 Nm around Motiti	Managed and monitored	MPI
Commercial Fishing protection halo - economic offset	Penguin shoal	Sustainable economic fisheries resources	MPI

Integrated Marine Management areas approach

Sites	Management Area	
Te Tau o Taiti Reef	*Marine Protection Area*	No-Take
Motunau Island	*EBM 1*	Managed Take
Motuhaku Schooner Rocks	*EBM 2*	Managed Take
Pudney Rock	FMA 1	Open
Penguin Shoal	FMA 1	Open
Motiti Rohemoana		
Tumu Bay	*Mataitai*	Customary Take
Te Huruhi Bay	*Mataitai*	Customary Take
Wairere Bay	*Mataitai*	Customary Take
Orongatea Bay	*Mataitai*	Recreational/Customary Take
Okarapu Reef	*Mataitai*	Recreational/Customary Take
Brewis Shoal	*Mataitai*	Recreational/Customary Take
Otamarakau	AMA	Aquaculture Area
Mainland Sites		
Pukehina	Taiapure	Open
Okurei Point	Taiapure	Open
Maunao	Mataitai	Recreational/Customary Take

Motiti Rohemoana Natural Environment Area - Characteristic assessment 2015

[summary of DoC, 2006 marine environmental assessment]

[Regional Council information, Stephen Park's environmental assessment memos]

[Waikato University Rena environmental studies]

Landscape and Marine-scape

[Summary of Sub-tidal Ecological Survey Conducted on Astrolabe Reef (Barter & Dunmore, 2015)]

Ecosystem characteristics

[Seashore Ecology of New Zealand and the Pacific (Morton, 2004)]

Oceanic Water column

Sub-tidal Sediment bottom

Sandy beach

Sub-tidal Rocky Reefs

Intertidal Rocky Reefs

Coastal Margin

Environmental influences and Impacts

Natural

Human

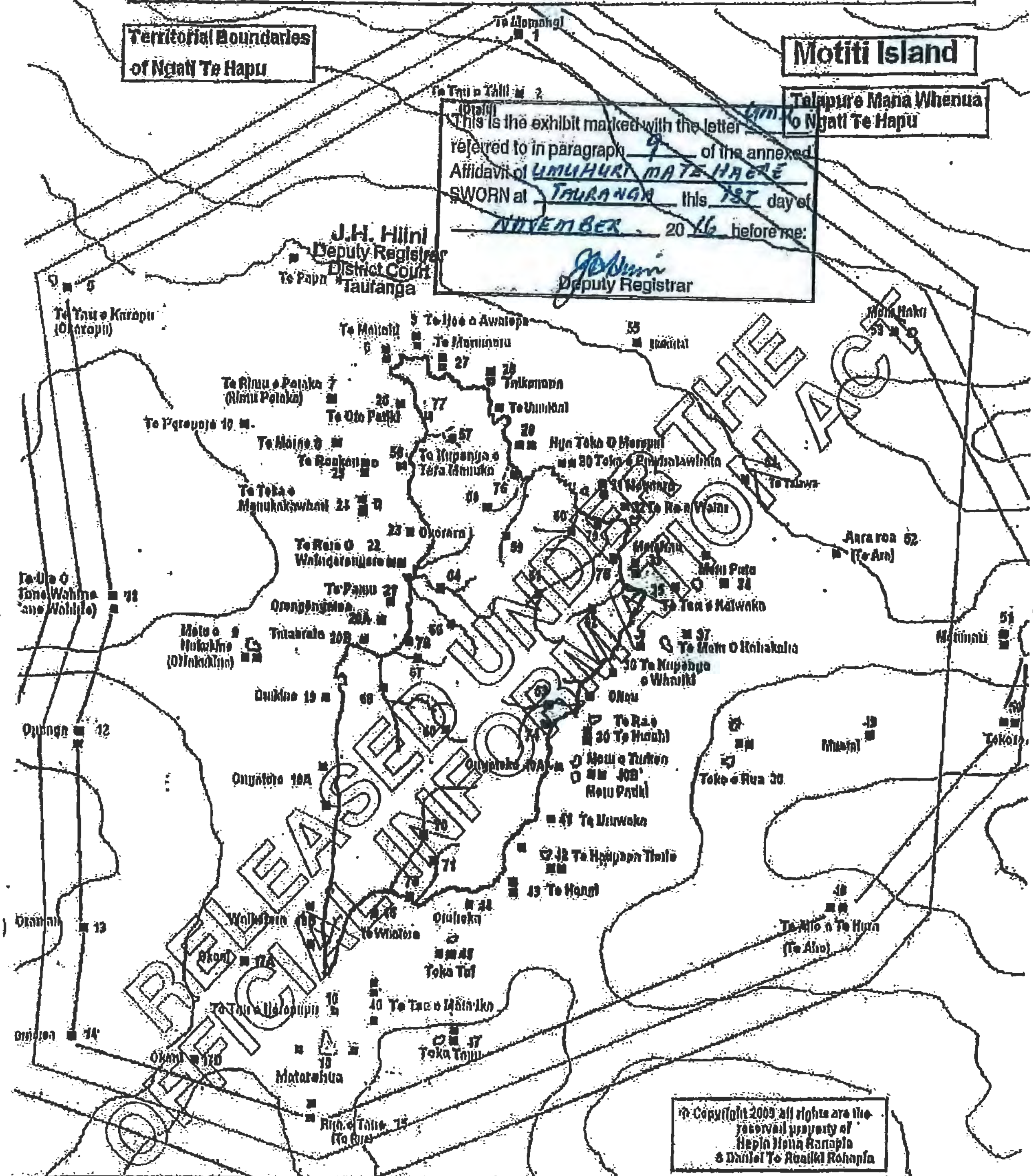
C: Appendices

a Matheson, 1979 extract: *"Acres of Fish"* (pp 81-83; 78-80)

b HMP maps

c Motiti Rohemoana maps

Ancient Fishing Grounds and Shell fish Gathering of Ngati Te Hapu



Fish Species:
(1) Tamure
(2) Paheha
(3) Terakihi
(4) Porae
(5) Hapuku
(6) Karitatata
(7) Moeone
(8) Arara
(9) Kehewai
(10) Haku
(11) Parore
(12) Maomao
(25) Aturere
(13) Kupara
(14) Kumukumu
(15) Manga
(16) Rawaru
(17) Hiwihiwi
(18) Pakurakura
(19) Pakirikiri
(18) Kokiri
(20) Marari
(21) Moki
(22) Nanua
(23) Whai
(24) Native Eel

Shell Fish Species:
(1) Kina
(2) Paua
(3) Pupu
(4) Mata Ngarehu
(5) Mara Ngohgoro
(6) Tio
(7) Nokihi
(8) Urehoiho
(9) Kuku - Nianie
(10) Papaka
(11) Koura
(12) Tipa

Territorial defined Boundaries of Ngati Te Hapu

Defind Historical Fishing Grounds

Defind Territorial Boundary

Demacation Boundary

Note:
All relevant information reference to:
(1) Documented Fishing Grounds
(2) Documented Shell Fish resources
(3) Documented Native Eel location
(4) Documented Hapu's fish stations
Refer to Document number 285

Design & Detail Information by Nepia Ranapia & Daniel Ranapia
Date 12/06/2008

Map No: 1

Appendix 3: Hapuku stock status in the Bay of Plenty

Hapuku stock status in the Bay of Plenty

1. The commercial groper (hapuku and bass) fishery in the 20th Century

1.1 I have reviewed all of the available commercial catch information for groper from official sources in order to document trends in the fishery in the Bay of Plenty. The name groper in official sources refers to two species, hapuku (*Polyprion oxygenios*) and bass (*Polyprion americanus*), which are grouped together in most of the commercial fishery catch data available up to the present time.

1.2 Changes in the individual contributions of each of the two separate species – hapuku and bass – to the total commercial catch of 'groper' recorded over the years cannot be determined. However the different depth distributions of the two species (they overlap but bass are found in deeper waters) helps to interpret catch trends.

1.3 Commercial catch data for groper (hapuku & bass) in the Bay of Plenty is only available from 1932 onward. Prior to that time there was no official collection of commercial catch information in New Zealand.

1.4 A number of problems exist in the use and interpretation of commercial fishery data in New Zealand. The principal problems are data quality in the early years and the fact that until 1982, the commercial data collected was 'landings by port' – so the precise catch area is not known. In spite of that, the 1932 to 1982 landings data by port provides valuable information on general trends in the commercial groper fishery. From 1983, vessels have been required to report their catch by 'fishery statistical area' (FSA) which are defined areas of the coast.

1.5 Since 2008 most inshore commercial fishing vessels have been required to record their fishing positions by latitude and longitude on fishing returns. However, this even more detailed information on fishing locations is generally not publicly available under a Ministry for Primary Industries policy that it is commercially sensitive. Thus it is normally withheld under the Privacy Act. As a result, the potentially most useful information to document the specific locations where

commercial fishing currently takes place (such as at or around Astrolabe Reef) is unavailable.

1.6 Using the catch and effort data from commercial fishing returns by FSA since the 1980s, we are now able to look at the patterns of catch and effort since that time over a broad scale. However, the resolution of the spatial information is still relatively poor as each FSA incorporates large areas of the coast

1.7 Based on patterns on reported catch by FSA along the northeast coast (North Cape to Cape Runaway) there has been a gradual and progressive shift of the groper fishery toward the far north of the North Island since the early 1980s. The contribution from the entire Bay of Plenty (FSAs 008, 009 and 010) to the total hapuku/bass catch in northern New Zealand has declined markedly since the early 1980s.

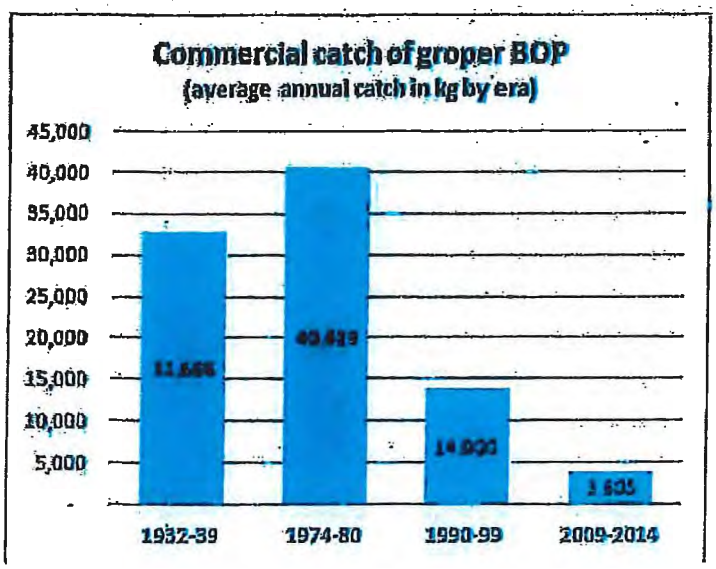


Figure B1. Groper (hapuku/bass) commercial landings at the Port of Tauranga (1930s & 1970s) and estimated catches from FSA009 (1990s onward) in the Bay of Plenty.

1.8 Figure B1 illustrates changes in commercial Bay of Plenty hapuku/bass catches over the last 80 years. The problems in interpreting the area of catch from port landings and the variable data quality from the early years mentioned previously should be kept in mind.

1.9 Figure B1 indicates that catches of hapuku/bass in the western Bay of Plenty (FSA009 which extends from Tairua to Whakatane)) have averaged less than 4t annually in the most recent six fishing years.

This compares to annual landings (for which the precise area of the catches is unknown) at the port of Tauranga that averaged over 32t in the 1930s and over 40t in the 1970s. From that time there is a rapid decline.

1.10 Limitations in the quality of the early data mean it should be interpreted with care. The 1930s data is likely to be less reliable as a systematic collection of fishing return information was still in its infancy. The catch area for fish landed at ports is uncertain, although in the 1930s small line fishing vessels did not travel far from port and generally fished local areas. Hapuku landings at the ports of Mercury Bay, Whakatane and Opotiki were reported separately. It is therefore reasonable to interpret Tauranga port landings in the 1930s (at least for line fishing for hapuku) as being taken from nearby waters in the western Bay of Plenty that correspond roughly to FSA009 (Tairua to Whakatane). By the 1970s Tauranga port landings were possibly coming from some catches further afield – the fishing industry had been deregulated in the 1960s and was experiencing rapid growth. The 1990s data may slightly overestimate catches in those years for the reasons given by Paul (2002). The most recent data from 2009 onward is likely to be quite accurate.

1.11 Even with the limitations in the data in Figure B1 in mind, it is very clear that current commercial fishery catches of hapuku/bass in the Bay of Plenty are a fraction of levels recorded in the past.

1.12 Advances in technology (e.g. vessel size and power, echo sounders, GPS, weather forecasting) also mean that the effective fishing power available to catch hapuku/bass today is far superior to that available in the 1930s. Overall, the reduction in catches points to a dramatic, even catastrophic, decline in the population of hapuku in the Bay of Plenty over the past century. Recent commercial catches averaging less than 4,000kg in FSA009 equate to no more than several hundred hapuku/bass each year, assuming average commercially caught fish weights in the range of 10kg to 20kg.

1.13 Various observers have reported reductions in fish numbers and size for many inshore fish species throughout New Zealand coastal waters over the past 100 years. This is a period when there was significant growth in commercial fish catches. Obtaining the maximum sustainable annual harvest (the maximum sustainable yield or MSY) from a fish stock requires that its abundance (measured as total biomass) be reduced to a much lower level compared to its unfished

state with the fish stock being made up (on average) of smaller and faster growing fish. Moving a stock to the level that generates MSY allows the greatest catch to be taken from a fish stock by all users. In doing so there are significant changes in fish populations that potentially alter the character of the fishery and fishing opportunities. The most observable changes are often most apparent in reduced fish abundance, smaller fish and a contraction of the geographic range of the population.

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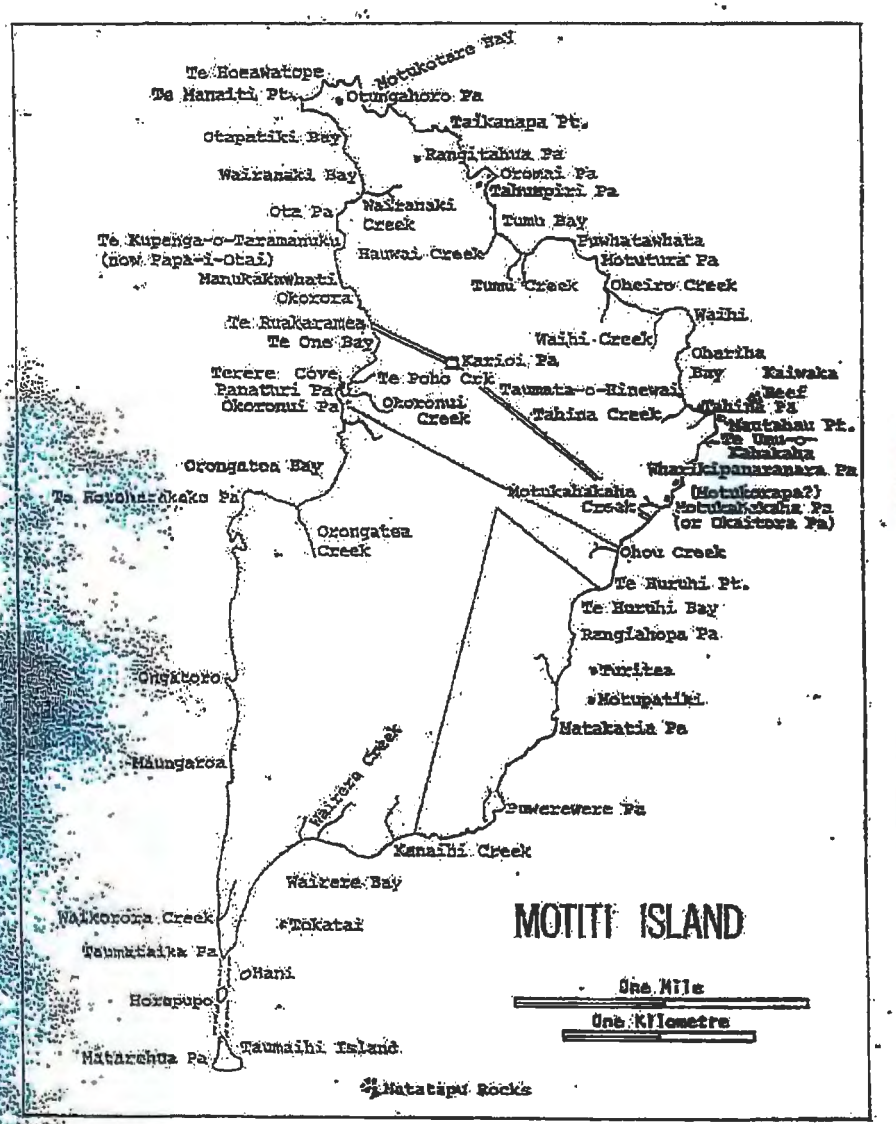


Motiti Island

Bay of Plenty

by

A. H. Matheson

Alistair Hugh Matheson

A H Matheson

J.H. Hiini
Deputy Registrar
District Court
Tauranga

This is the exhibit marked with the letter "AM 4" referred to in paragraph 9 of the annexed Affidavit of ANNEMARIE MATENGA SWORN at TAURANGA this 13th day of NOVEMBER 20 16 before me:

Deputy Registrar

1975

Published by the author under the auspices of the Whakatane and District Historical Society (P.O. Box 203, Whakatane) and distributed by the Society as Monograph Number 2.

427

361

ACRES OF FISH

The rocks, reefs and shoals in the waters around Motiti, which are such a hazard to shipping, have produced some of the best fishing in the Bay of Plenty. the fishing was once so good that, in 1924, the *Bay of Plenty Times* considered it, along with Mayor Island, as an "admirable base from which deep sea fishing parties may work with every degree of comfort". According to the *Times*, 30 December 1929, a "sportsman aboard a launch" reported that there were:

> "... acres of fish in shoals near Motiti Island and he has never before seen kingfish and kahawai so numerous . . . His party caught as many of they wanted in a very short time and then desisted. The surface of the ocean was literally swarming with fish."

During the same week Major Choate, Dr MacDiarmid and party, also fishing in these waters, caught 35 hapuku, 3 sharks, and numerous snapper, tarakihi and cod. At the end of March 1930 the islanders caught a 125 kg swordfish and prepared a big feast on the fish.

There is no doubt that the Motiti fishing grounds were an important source of food for the Maori people, not only on the island but on the mainland as well. "Comus", the author of two articles about Motiti in the *Auckland Weekly News*, 14 and 28 December 1889, was impressed with what he saw of the fishing on his visit to the island and with the possibilities of a fishing industry there:

> "Fishing is one of the principal occupations in the summer time. Large quantities of crayfish are caught, both by diving and in baskets. Many of these are sold in Tauranga. All the ordinary kinds of fish abound, and are readily caught by throwing out a line from the shore. The hapuku fishing ground, a little to the east of the island, is one of the very best to be found anywhere. These fish are caught in large numbers. The natives have a peculiar way of preserving them by steaming in their ovens [hangis] and drying in the sun. In this form they are often sent as presents to other tribes. It is very likely that, before long, Motiti will be the site of a fishing industry, and the hapuku, now so little heard of, will become objects of keen competition. It is strange that more has not been done to develop the fishing in the Bay of Plenty and elsewhere. With capital and push it could doubtless be made one of the most profitable of our local industries."

Anyone familiar with the Motiti fishing grounds in 1979 can only ask, "Where have all the fish — and crayfish — gone?" Has there been too much "push" by professional and amateur fishermen alike? For the Maori people, though, there are at least plenty of sea eggs, possibly because they don't suit European tastes.

When the young Dutch immigrant Garry Oster stayed on the island with Kepa and Bella Nuku in 1953-4, the Maoris could catch all the fish they wanted simply by throwing out lines from the shore. After working for a few hours in the maize fields, they would return when the tide had gone out and pick up the fish lying on the now exposed rocky shelf.

Some enormous fish were caught in those days. One snapper caught by Bella Nuku, recalls Garry Oster, was about a metre long and half a metre wide.

He also remembers that the islanders regarded octopus as a delicacy. It was usually well salted and hung up on a tree to dry, and later delicious steaks were cut from it. Garry also has vivid recollections of a naked islander emerging from the sea near the rocky shore with a huge grin on his face and numbers of crayfish tied around his waist.

With all the abundance of sea foods at Motiti, there is one longtime staple of Maori diet — the common pipi — that is not to be found there. Moreover, every attempt to establish that shellfish on the island coast, especially at Te One (or Sandy) Bay, has ended in failure. In the late 1920s and the 1930s, recalls Bella Nuku, parties of Motiti people used to sail over to Maketu in their boats and take pipis from the sand-spit west of the township. However, they much preferred the shellfish on the Kaituna Estuary side of the spit to those on the ocean side. In the evening the islanders would make a fire and camp for the night in the sand-hills — or maybe attend a dance in Maketu. At a later date the Maketu people would come over to Motiti to a dance at the island.

An unusual fishing story of early Motiti was recounted in the *Times* in 1881, shortly after the death of the chief Hori Tupaea. In the year 1856, when a European trader was visiting Motiti, at the same time as Tamihana (the King-maker) was staying on the island with Hori Tupaea, a storm occurred the like of which had never been heard of by the old Maori sages. Among the many vessels wrecked was a Maori trading schooner, which apparently lost all hands overboard and was later found high and dry on a sandbank inside Katikati Heads.

Some time after the storm a large canoe returned to Motiti from the fishing grounds with a big catch of hapuku and a number of sharks for division amongst the different families. While the women were cleaning the fish, however, they found inside them portions of human flesh. At this, they began to yell and cry alarmingly, and all the people of the pa came running to the beach.

The chief Hori Tupaea, who is said to have had a great abhorrence of human flesh, advised them to throw the fish away. This however, they declined to do. Tupaea, in anger at their behaviour, left the pa for several weeks. But he consented to return after the people had agreed to abandon their old cooking stones and coverings, at which there were great rejoicings.

On a less serious note, the *N.Z. Herald* reporter who visited Motiti early in 1955 remarked on the islanders highly developed sense of humour: "One of their favourite gambits is to regale visitors with stories of large catches of fish and then produce a tin of sardines for a meal."

A Whale Chase

On several occasions in former years so many whales were seen near Motiti that the islanders obtained the necessary equipment and set out after them. In the Spring of 1872, with gear lent by Mr D. Asher, of Tauranga, they caught three whales, although one got away. It was expected that in future the trade would be a lucrative one, but a decade passed before another catch was made.

In the winter of 1882 whales were again about in the Bay of Plenty. On 24 June the *Times* reported that the Motiti people were organising a whaling expedition, in which the Te Kaha people also had an interest. Four large boats had left Tauranga fully equipped with the necessary gear. But it was not until the Spring

that the islanders had an opportunity to test themselves against the great mammals of the sea, and it was a test that nearly ended in tragedy. By early November they had caught, and lost, two whales. Then, on Saturday 11th, they had another chance to make a catch. The story of the drama that followed was printed in the *Times* on the following Monday:

> "An exciting chase after a whale took place outside our harbour on Saturday. At dawn in the morning a large school of whales were seen on the seaward side of Motiti, and three boats, manned by the Patuwai natives, put off. Two of the boats soon fastened to a very large 'Humpback', and were dragged at great speed in the direction of Tauranga. When just off the entrance, the whale headed out again, and on reaching Karewa [Island] it was so exhausted that the men hauled close up and lanced it repeatedly, apparently in a vital place, for it spouted blood, dyeing the water for some distance round.
>
> "Owing to the heavy sea, one of the boats by this time was full of water, and had to cast off. As 'Friday', the 'headsman' in the other boat was preparing to lance the fish again, it suddenly struck the boat with its 'flukes', and tearing the line out of the groove, sweeping away the oars and rowlocks from one side, and drawing two of the men overboard and filling the boat with water at the same time, the harpoon drew, and the fish, which was worth [£600], escaped. A third boat arrived just too late. The natives were much exhausted and landed on Karewa [Island] to dry their clothes.
>
> "In the afternoon Capt. Baker, who was passing with the 'Staffa', with his usual kindness, gave them a tow in.[34] The man 'Friday' appears to have been bruised internally and was in great pain. The boats returned to Motiti last night."

Before the end of the month the islanders succeeded in catching a calf whale 6 metres long. From this prize they expected to extract 3 tonnes of oil, and they made a trip to Tauranga for a large number of casks to hold it. On 28 July 1883 the *Times* reported that the Motiti people had fitted out 4 whale-boats, built by themselves, for the whaling season, which promised to be a successful one:

> "They are well equipped and the services of some whalers from the East Cape have been secured, as well as that of a native named Friday who is well known as being a first class hand."

Until about 30 years ago whales continued to be a fairly common sight in Motiti waters. The greatest visitation appears to have been in November 1926, when the Tauranga paper noted:

> "During the past fortnight a large number of whales have been observed in the vicinity of Motiti Island. The whales came as close as two miles [3.2 kilometres] off the island. The natives say that they have sighted as many as twenty whales spouting at the same time. Five whales were seen off the Island yesterday morning. An old native resident states that he has never before observed as many whales in the locality."

Once, Mr Bill Paterson witnessed a titanic and bloody battle between a whale and a shark off the north-western side of the island. The fight went on for some time without any apparent decision, and the combatants eventually moved away in the direction of Mayor Island.

came out sodden. We were passing the 'Old Kuia' [Te Kuia Rock, see below] and she threw the whole lot at the old lady, 'Take it all, you old devil, you didn't get me that time.' Marmee was always afraid of the sea and it says a lot for her courage and determination that she stuck it out on Motiti for 6 years.

"Another trip, this time from Tauranga, took us nine hours, as we had to creep down the coast to Maketu, then over from there. I can't remember any details, I was so ashamed of myself. I was sea sick, the first and only time, but it was an awful thing for an 8 or 9-year-old to admit to. It turned out alright the next day, tho, as I woke up covered in measles! We must have been staying on the mainland for a while and I picked them up from someone there."

Te Kuia Rock

For generations it has been the custom for those on board the boats of the "Motiti flotilla", and indeed all other vessels passing through the Tauranga harbour entrance, to throw into the sea a small offering of food, coin or tobacco to "Te Kuia" (meaning "the old woman") the rock formation at the foot of Mount Maunganui marked on the charts as North-West Rock. Actually, there are two rocks, one smaller than the other.

According to one Maori legend, the larger rock is the petrified body of a kuia (old woman) and the smaller that of her dog. It seems that once in ancient times when the old woman was sitting on top of the Mount with her dog she sighted hostile war canoes approaching. In her haste to get down the Mount to warn the people below, she lost her footing and fell headlong into the sea, followed by her faithful dog. And although the dog struggled valiantly to save the unconscious woman, at length both were drowned and their bodies washed ashore. To commemorate this event the two of them were turned into rock to stand on perpetual guard at the entrance to Tauranga Harbour. As F. M. Pinfold writes (*Journal of the Tauranga Historical Society*, March 1960. See also the *Times*, 7 November 1945.):

> "And that is why, from every launch that passes, some food is thrown to the Kuia Rock as an offering for a surety of calm seas and a successful expedition. It is not the amount of food so given which matters, but rather, the spirit behind the gift. So, should you have not even bait in your boat, the tossing overboard of a small coin will have the same effect, for with it the kuia may buy herself some food!"

It was not far from Te Kuia Rock that a party of Motiti people had a miraculous escape from death on 18 May 1947. Those who left the island that day on Kepa Nuku's launch *Huinga* were Mrs Ngarongiro Wi Keepa, Joe and Hazel Grant, Mick Hoete, Eddie Matehaere, Kepa and Bella Nuku and their daughter Maraea. Before leaving they had been warned by Mr Nuku's grand-uncle, Ikanui Riihara, not to go because the waves were breaking on a certain reef in the direction of Mayor Island, and this only happened in the heaviest seas.

As it turned out, the conditions were the worst that skipper Nuku had ever experienced, and it was necessary for his relative, Mick Hoete, to assist by

watching the movements of the sea. When trouble came, however, there was little they could do as a huge, freakish double wave reared up behind them and engulfed the *Huinga*. But by an incredible chance the onslaught of the wave jolted out of place a torch so positioned as to hold open the cabin door, which instantly slammed shut and saved the boat from being swamped and those inside from a watery grave.

When the monstrous wave had passed, the *Huinga* was on her side and her bow was pointing back towards Motiti. With the next swell, though, she righted herself, Kepa Nuku meanwhile grimly holding on to the wheel and bringing her round. Three more great waves swept the *Huinga* along and then the launch was in calm waters, near Te Kuia Rock. Later, as they proceeded up the harbour to Tauranga, the islanders were met by Mr George Faulkner coming out to search for them in one of his firm's launches. He had been informed of the capsizing of *Huinga* by a resident of Mount Maunganui.

TERRIBLE REEFS

There are enough reefs, shoals and rocks in the waters around Motiti Island to cause mariners to exercise some caution. In February 1827 the French navigator Dumont D'Urville's ship *Astrolabe* was caught in a violent north-easterly storm in the Bay of Plenty and had a frightening experience near what is now known as the Astrolabe Reef. The visibility cleared just in time to reveal the awe-inspiring sight of the huge waves crashing on the rocks and sending columns of foam high into the air. The Frenchmen were glad to leave behind the "terrible reefs which might have been the grave of the 'Astrolabe' ".[129]

A little over a year later, in the morning of Monday, 7 April 1828, the Rev. Henry Williams arrived off Motiti in the C.M.S. schooner *Herald*. It was probably the sight of this same reef that prompted him to remark in his journal:

> "At daylight discovered a very dangerous sunken rock which we had passed near in the night. The sea was breaking fearfully upon it. The Lord is my shepherd I will not fear."[129]

The survey by H.M.S. *Pandora*, in 1852-3, marked the position of the reef accurately on the charts, but the early editions of the *N.Z. Pilot* warned that at high water in very fine westerly weather it might not show. Mariners were also advised to avoid the neighbourhood at night because Motiti is low-lying and there is no other land near as a guide. Even at low tide in these conditions the Astrolabe Reef can be a menace, as the fate of the 67-tonne schooner *Nellie*, which struck the reef on Sunday, 13 January 1878, clearly proved.

The *Nellie* was on a voyage from Lyttelton to Auckland with a cargo of oats, flour, malt and bacon. At about 8.20 p.m. on a clear moonlight evening, with a smooth sea and the wind from W.S.W., there was no sign of a wash to show the 1/3 metre or so of rock the schooner suddenly struck. Captain Armstrong succeeded in getting the vessel off the reef—injuring himself in the process—and as she was badly holed and making so much water, he tried to beach her on the eastern side of Motiti. But the wind was baffling and there was no time to spare, so he ran her onto the rocks on the northern side of the island. After engaging

the islanders to get the cargo out at once, the captain set off for Tauranga in Mr Douglas' boat to report the accident.

Before the vessel broke up, most of the cargo, together with spars, rigging and an anchor were salvaged. One week later, on Sunday afternoon, 20 January, the s.s. *Staffa* (Capt. Baker) called at Motiti and lay about 400 metres off shore while the islanders brought out in their boats the 35 tonnes of goods they had saved from the wreck. The hull of the *Nellie* was purchased from the New Zealand Insurance Company, at auction in Tauranga, by Mr Thomas Wrigley for "one pound sterling (£2), according to the *Bay of Plenty Times*.

Another of Motiti's dangerous reefs, the Okarapu,[130] was not generally known to Europeans until it was discovered, in 1866, by Captain T. S. Carmichael, the first Pilot and Harbourmaster at Tauranga. In his log, Saturday, 17 March 1866, Carmichael recorded:

> "Light wind from the N.E. and very heavy sea running . . . Saw the sea breaking over the Astrolabe Rock, also a heavy continual break bearing from centre of Mount Maunganui N.E. by E ¼ E Eastly and appeared to be about 1½ to 2 miles from the northern end of Flat Island [Motiti] which is not down on any chart, the natives call it the Okara."

Two days later, when Captain Carmichael piloted the steamer *Ladybird* up to Te Papa, Tauranga, he marked the reef on the captain's chart and gave him a notice to be published in the newspapers.

The dangers of the Okarapu Reef — a break only shows in heavy seas — were noted in the *N.Z. Pilot*. But this did not prevent the bulk-phosphate carrier *Golden Master* from striking these submerged rocks on the afternoon of 10 January 1959. The 13,000 tonne ship was holed and making water so quickly she had to be beached off Matakana Island. After repairs, however, she was able to make her way into the Tauranga harbour under her own power.

When Gilbert Mair Snr published his pilot directions for New Zealand waters, in 1839, he pointed out another difficulty for shipping around Motiti. Mair remarked that the island had no harbours, but small vessels could anchor between it and the main, although "the holding ground is not good being rocky bottom".[131]

The truth of this observation is borne out by the experience of the survey vessel H.M.S. *Pandora* on 30 November 1852. Early in the morning all hands had to be "turned up" to prevent the anchored ship drifting on shore in Orongotea Bay.[132] In more recent years some of the "Motiti flotilla" and at least one visiting launch have run onto the rocks after dragging their anchors.

A rocky bottom can occasionally hold an anchor so fast it can't be recovered. This was the experience of the Rev. Henry Williams, who anchored the mission cutter *Karere* off Motiti on 5 November 1831 and sent a canoe ashore for wood and water. The following day (Sunday) he recorded in his journal:

> "Appearance of wind from the S.E. Attempted to weigh the anchor, but found it had hooked a rock. After much trial were obliged to slip and make sail to get under command before the breeze freshened."[133]

Table 12: Rangitāiki River objectives and titles of policies and methods to achieve the objectives

Objectives	Policy titles	Page no.	Method titles	Implementation	Page no.
Objective 1 Tuna within the Rangitāiki River catchment are protected, through measures including enhancement and restoration of their habitat and migration paths	Policy RR 1B: Protecting and restoring tuna (eel) habitat and migration pathways		Method 23D: Require structures that provide passage for fish migration up and down the Rangitāiki River	Regional council	21
			Method 23E: Develop an action plan to provide access for migrating tuna (eel) in the Rangitāiki River catchment	Regional Council	21
			Method 23F: Support the use of rahui to restrict harvesting of tuna in the Rangitāiki River catchment	Regional Council, district councils, Department of Conservation, Ministry for Primary Industries and iwi authorities	21
			Method 23G: Advocate the termination of commercial tuna harvesting within the Rangitāiki River catchment	Regional Council, district councils, Department of Conservation, Ministry for Primary Industries and iwi authorities	21
			Method 75: Promote measures to protect, monitor and understand tuna (eel) in the Rangitāiki River catchment	Regional council and iwi authorities	23
			Method 3: Resource consents, notices of requirement and when changing, varying, reviewing or replacing plans	Regional Council and district councils	29
			Method 26: Facilitate establishment of community-based ecological restoration programmes	Regional Council and district councils	31

This is the exhibit marked with the letter UMS referred to in paragraph 12 of the annexed Affidavit of UMUHURI MATE HAERE SWORN at TAURANGA this 1ST day of NOVEMBER 2016 before me:

Deputy Registrar

J.H. Hiini
Deputy Registrar
District Court
Tauranga

Rangitāiki River Catchment Policies

Applying the Rangitāiki River catchment provisions

The Rangitāiki River catchment policies and methods only apply to the Rangitāiki River catchment area within the Bay of Plenty region identified in Map 4aa. These provisions should be read along with other region-wide provisions. Where a conflict exists between any Rangitāiki River catchment specific provisions and region-wide provisions, the catchment specific provisions shall prevail.

Policy RR 1B: Protecting and restoring tuna (eel) habitat and migration pathways within the Rangitāiki River catchment

Protect and restore the habitat, migration pathways and population of tuna within the Rangitaiki River catchment by:

(a) Promoting a better understanding of tuna life cycles and the current state of tuna habitat within the catchment;

(b) Working with river users to enhance tuna habitat and two-way migration pathways;

(c) Requiring new structures to avoid impeding tuna two-way migratory pathways;

(d) Requiring the modification of existing structures to allow tuna access;

(e) Encouraging research into new and innovative methods of providing or enhancing tuna access;

(f) Advocating for the restoration of wetlands, coastal lagoons and retired oxbows for tuna habitats; and

(g) Advocating rahui and restrictions on commercial harvesting of tuna.

Explanation

Tuna have a unique and important customary fishery status in the Rangitāiki River, representing the wealth of the people. Long-finned eels feature in local legends as the guardian of the resource and of its people.

Ensuring suitable tuna habitat exists within the catchment and providing for their natural life-cycle, including migration pathways, is essential for the survival of the species within the catchment.

The quality of tuna habitat within the Rangitāiki River catchment has been degraded by a reduction in the quality and extent of riparian vegetation together with the impacts of increasing levels of nitrate and sediments on water quality.

Obstructions and structural modifications to waterways (such as dams or culverts) have affected the migratory pathways of tuna from the sea to the Rangitāiki River and back. As a result human intervention is required to enable tuna to complete their natural lifecycle.

Restoring habitat and two-way migration pathways for tuna requires a range of measures and a collaborative effort involving iwi, industry, councils and the wider community. These measures include undertaking research to improve our understanding of the lifecycle of tuna within the Rangitāiki River catchment and the current state of the habitat.

Protecting two-way migratory pathways requires new structures located in the bed of rivers to be designed to allow for tuna migration. Existing structures should be modified or adapted where necessary to restore access.

There may be a range of potential options to incorporate tuna access in new and existing structures, particularly where these impede access to coastal lagoons and tributaries. Research into the development of new and innovative options that provide for two-way tuna migration is encouraged.

Protecting the habitat and migration pathways of tuna is one of the key strategic actions of the Rangitāiki River Document. The actions set out in Policy RR 1B will assist in achieving this outcome.

Measures such as rahui and restrictions on commercial harvesting of tuna may also be effective in protecting and restoring the tuna population in the catchment.

Table reference: Objective 1, Methods 3, 26, 63, New Methods 23D, 23E, 23F, 23G and 75.

3.2 Methods to implement policies

Table 4 Methods to implement policies

3.2.1 Directive methods

Method 23D: Require structures that provide passage for fish migration up and down the Rangitāiki River catchment

Require the provision of fish passage for all new and existing structures (including culverts) where they impede fish passage in the Rangitāiki River catchment.

Implementation responsibility: Regional Council

Method 23E: Develop an action plan to provide two-way access for migrating tuna (eel) in the Rangitaiki River catchment

In collaboration with iwi develop an action plan to provide two-way access for migrating tuna (eel) including by:

(a) Working with hydro-electricity generators and researchers on projects;

(b) Analysing and conducting research;

(c) Making recommendations on restoration programmes; and

(d) Working with river users to address tuna access.

Implementation responsibility: Regional Council;

Method 23F: Support the use of rahui to restrict the harvesting of tuna in the Rangitaiki River catchment

Support the use of rahui as a measure to restrict the harvesting of tuna within the Rangitāiki River catchment.

Implementation responsibility: Regional Council, district councils, Department of Conservation, Ministry for Primary Industries and iwi authorities

Method 23G: Advocate the termination of commercial tuna harvesting within the Rangitaiki River catchment

Advocate to terminate commercial harvesting of tuna within the Rangitaiki River catchment.

Implementation responsibility: Regional Council, district councils, Department of Conservation, Ministry for Primary Industries and iwi authorities

Method 23H: Rangitaiki River Catchment Annual Work Programme

Policies RR 2B, RR 3B, MN 1B, MN 7B, MN 8B, MN 5B and MN 6B shall be implemented through the Rangitaiki River catchment Annual Work Programme.

Implementation responsibility: Regional Council, Rangitaiki River Forum, Whakatane District Council and iwi authorities.

Method 23I: Develop sustainable environmental flow and catchment load limits in the Rangitāiki River catchment

Sustainable flow and catchment load limits in the Rangitāiki River catchment shall be developed in accordance with the National Policy Statement for Freshwater Management framework and include:

(a) The current state and anticipated future state
(b) Freshwater objectives; and
(c) Limits for meeting freshwater objectives.

Implementation responsibility: Regional Council

Method 23J: Develop strategies for managing wastewater and stormwater in the Rangitāiki River catchment

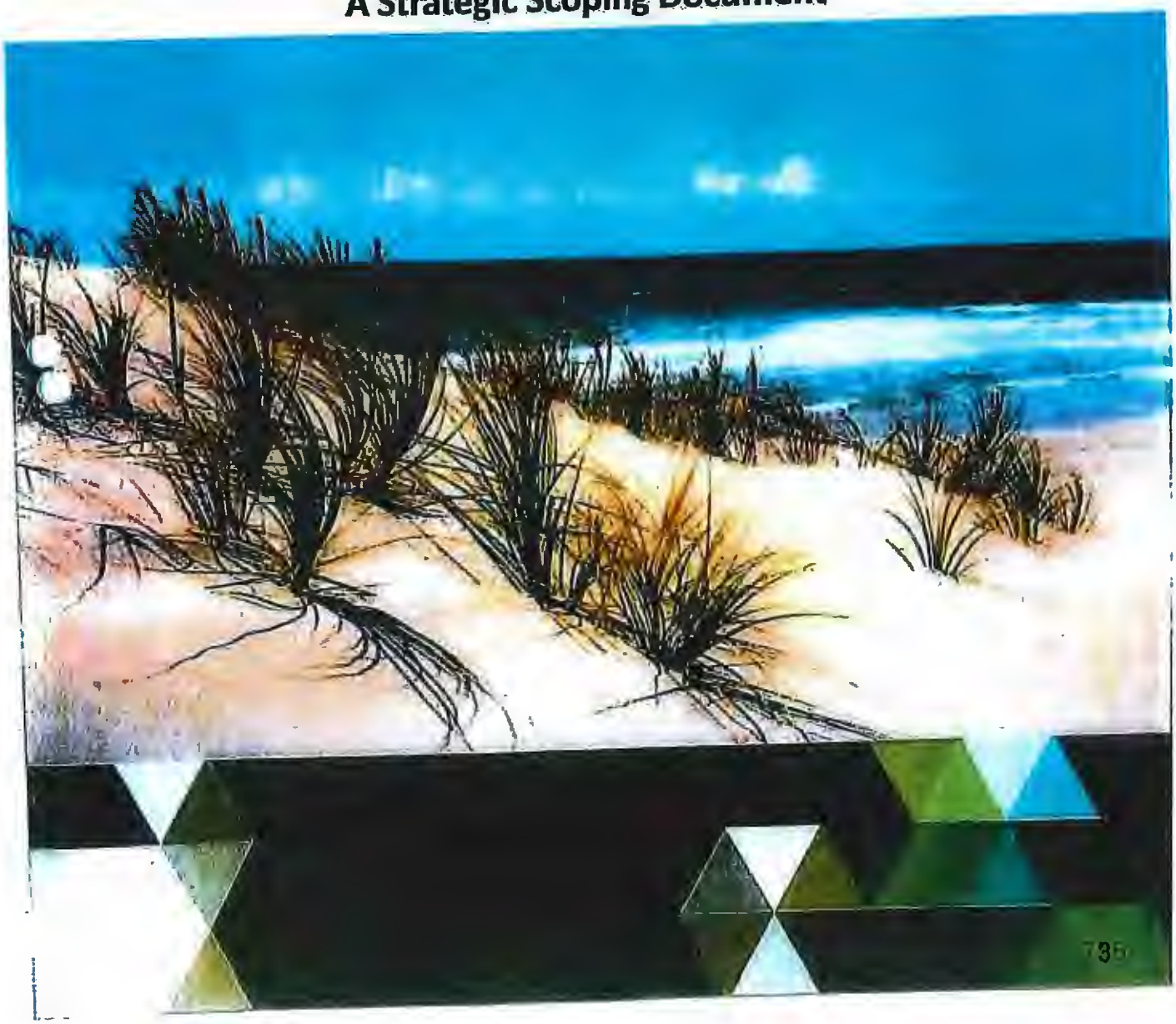
In liaison with tangata whenua and local communities develop and implement strategies for the alternative treatment and disposal of wastewater and stormwater in the Rangitāiki River catchment.

Implementation responsibility: District councils

LANDCARE RESEARCH
MANAAKI WHENUA

Reporting Environmental Impacts on Te Ao Māori:

A Strategic Scoping Document



Reporting Environmental Impacts on Te Ao Māori:

A Strategic Scoping Document

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June 2016

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Contents

Glossary

Hapū	Sub-tribe, pregnant
Harakeke	New Zealand flax, *Phormium tenax*
Hui	Meeting, conference, gathering
Inanga/Inaka	Whitebait species, juvenile forms of native fish, five separate *galaxiid* species
Kahawai	*Arripis trutta*
Kai moana	Seafood
Kai awa, Kai roto	Freshwater species used for food
Kaitiaki	Agent or guardian carrying out the act of tiaki, of benefit to the resource or taonga, can be a human, animal, or spiritual being, e.g. taniwha
Kaitiakitanga	Stewardship, guardianship
Kākahi	Freshwater mussel, *Echyridella menziesi*
Kanakana, Piharau	Lamprey, *Geotria australis*
Kaupapa Māori	Māori focused, Māori framework or philosophy
Kawakawa	*Piper excelsum* subsp. *excelsum*
Kāwanatanga	Governorship, government, rule, authority
Kererū	New Zealand pigeon, *Hemiphaga novaeseelandiae*
Kiekie	*Freycinetia banksii*
Ki uta ki tai	Mountains to the sea
Kina	*Evechinus chloroticus*
Kōaro	A species of whitebait, *Galaxias brevipinnis*
Kōrero	Language, stories
Koromiko, Kokomuka	*Veronica* (*Hebe*) spp., especially *V. stricta* and *V. salicifolia*
Kōura	Freshwater and salt-water species of crayfish, *Paranephrops* spp.
Kuku	Common mussel, *Perna canaliculus*

Kupu	Word
Kuta, Paopao	*Eleocharis sphacelata*
Mahi	Actions, work
Mahinga kai	Food gathering area
Mana motuhake	Separate identity, self-government, mana through self-determination and control over one's own destiny
Mana whakahaere	Decision-making authority
Mana whenua	People with tribal authority over a defined area of land, indigenous rights, status
Manaakitanga	Principle of reciprocity, respect, act of hosting, looking after
Manu	Bird
Mānuka	*Leptospermum scoparium*
Marae	Traditional gathering area, area for formal discourse at front of meeting house
Maramataka	Māori calendar – a planting and fishing monthly almanac
Matariki	Pleiades, The Seven Sisters - an open cluster of many stars in the constellation Taurus
Mātauranga Māori	Māori knowledge, Māori philosophy
Mauri	The essential essence of all being, the life force which is in everything
Ngahere	Bush, forest
Oranga	Well-being
Pīngao	*Ficinia spiralis*
Pipi	A type of shellfish, *Paphies australis*
Pou herenga	Māori values and principles
Rangatiratanga	Principle of authority
Ranginui	Sky-father
Raranga	Weaving

Raupō	Bulrush, *Typha orientalis*
Rohe	Boundary, territory, geographic location, typically of iwi/hapū
Rongoā	Remedy, medicine, treatment
Takiwā	Place, area, tribal area
Tamure	Snapper, *Chrysophrys auratus*
Tangata whenua	Local people, people born of the whenua, people who have authority in a particular place
Tangihanga	Funeral, rites for the dead
Taniwha	Mythical or spiritual creature or kaitiaki, can take many forms, e.g. large tuna
Taonga	All things prized or treasured, tangible and intangible, treasured resource, possession or cultural item, including te reo, culturally significant species, etc.
Taonga tuku iho	Those treasures that have been passed down, cultural property, heritage
Te hauora o te taiao	Ecosystem health
Te Ao Māori	The Māori world, Māori world view
Te Ao Tūroa	The natural world
Tiaki	Care for, look after, guard, sustain
Tī kōuka	Cabbage tree, *Cordyline australis*
Tikanga	Custom, protocols, ethics
Tipua	Metaphysical/supernatural phenomena
Titi	Muttonbird, sooty shearwater, *Puffinus griseus*
Tohu	Indicators, features or marks
Tohunga	Skilled person, chosen expert, priest, healer
Tuangi, Tuaki	Cockle, *Protothaca crassicosta*
Tuna	Eel of various species, *Anguilla* spp.
Tūpuna	Ancestors, grandparents

Tūrangawaewae	Place of being, origin, homeland
Urupā	Burial sites
Wāhi	Place or location, site
Wāhi tapu	Sacred sites, sites of restricted access, off-limits
Wāhi taonga	Sites of significance, treasured sites
Wāhi tūpuna	Historical sites, ancestral sites, heritage sites
Wai	General term for water
Waiata	Song
Waimate	Water that has lost its mauri or life force, dead water
Waiora	Health, well-being
Waipuna	Water from a spring
Wairua	Signifies spirit, or something having a spiritual component
Wairuatanga	Act of spirituality, principle of spirituality
Wānanga	Seminar, conference, Māori tertiary institute
Whakapapa	Genealogy, ancestry, interconnectedness
Whānau	Family, extended family, connection
Whānaungatanga	Action of sharing experiences, connectedness
Whenua	Land, homeland, placenta

Summary

Project and Client

Under the Environmental Reporting Act 2015 (the Act), the Ministry for the Environment (MfE) and Statistics New Zealand have an obligation to regularly report on the state of and pressures on New Zealand's environment through synthesis and domain reports. Environmental impacts that have particular significance for Māori are reported under the impact category of Te Ao Māori. These reports must be informed by a holistic Māori perspective and capture information that contributes to Māori decision-making and well-being. The Ministry for the Environment contracted Landcare Research to provide a strategic direction for environmental reporting on Te Ao Māori in order to support the planning of future work to satisfy the Te Ao Māori requirement in the Act.

Objectives

The primary deliverable of the project is a report identifying the measures that will allow a comprehensive picture of the impacts on and state of the environment from a Te Ao Māori perspective.

Our objectives were:

- to engage a community of Māori active in environmental research/monitoring to identify measures embedded within a Te Ao Māori worldview across three prioritised domains (land, freshwater, marine)
- to use project team knowledge to prioritise the measures
- to identify ways of measuring and data sources/streams.

Methods

We used a mixed methodological approach comprising literature review and hui to inform and develop a relevant Te Ao Māori framework and to 'ground truth' the types of measures that should be prioritised. Engagement with iwi, hapū and experts in mātauranga Maori is acknowledged in the scope as critical to inform the work.

Two hui were organised using the networks of both MfE and the project team. Kaumātua, iwi environmental practitioners and resource users, and Māori and Pākehā representatives from central and local government agencies and academia were invited. Most participants were specifically chosen for their familiarity and experience with environmental indicators, or their resource use expertise.

A framework promoting the Treaty of Waitangi principle of partnership was presented at the second hui and acknowledged by participants as fit for purpose in describing Te Ao Māori measures.

The project team took themes and measures developed at hui 1 and 2 and aligned them with the five principles of mana motuhake associated with the framework. Measures were then prioritised according to six criteria. From here, an inventory was undertaken of existing data versus data which would need to be commissioned. At the end of this process further prioritisation gave a starting set of measures for which rapid progress could occur.

Results

The hui participants (hui 2) came up with *characteristics* of appropriate measures and selected *priority* measures for the topics they worked on. The project team considered hui participants' characteristics and those of the Ministry to settle on the following criteria for *prioritising* the measures: meaningful to Māori, national (where possible), realistically measurable, repeatable, data already exist (where possible), concern the environment directly. The project team settled on a group of measures that reflect each of the biophysical domains with some cross-domain measures relating to governance (although not all can be reported on under the Act). The measures were chosen to reflect the core values of rangatiratanga and kaitiakitanga, and seek to enhance whanaungatanga with taonga in the natural environment.

Conclusions

The primary deliverable in this project was to identify a set of prioritised measures across the biophysical domains (freshwater, land, and marine). Through extensive consultation, literature review and two national hui, we have organised provisional measures according to the Te Ao Māori framework given in the Results section. This provides an environmental reporting template for Te Ao Māori across five main principles:

- Mana whakahaere (Leadership, Decision-making);
- Tūrangawaewae (Place to stand, Sense of place);
- Whanaungatanga (Relationships, Interconnectedness);
- Taonga tuku iho (Intergenerational transfer of knowledge and practice);
- Te Ao Tūroa (Interaction with the natural world).

Using this framework a set of measures has been developed and prioritised. Māori-related impact topics can be reported on through these prioritised measures, both quantitatively (e.g. metrics, statistics) or qualitatively (e.g. case studies, narratives, commentaries).

Components of measures for which there are likely to be sufficient data available for immediate to near-term reporting are:

- Wetland extent
- Abundance of a) shellfish and in-shore fish species (e.g. pāua, kina)
  b) tuna, whitebait and other freshwater species
- Water drinkability and swimmability

- Health of aquifers and number of freshwater springs
- Abundance of taonga manu using DOC Tier 1 data where possible (kererū, kiwi)
- Wild food availability assessed by abundance of exotic animal and plant species (DOC Tier 1 data).

Recommendations

A number of recommendations are given:

- A cross-domain (cross-provider) technical advisory group should be established by MfE to further refine and order the priority measures for their successful interpretation. The TAG should include members able to advise on availability and suitability of data to meet SoE reporting requirements as well as ensuring measures and indicators are meaningful to Māori.
- Further scoping of the suitability of existing data (such as inshore fish records) should be done before reporting on the specific species listed here.
- Iwi/hapū have a keen and enduring interest in assessing the mauri of their natural environment. Future environmental monitoring and reporting needs to be embedded into regional SoE monitoring programmes with the active participation of local iwi/hapū.
- To be consistent with best practice, the project team suggests that the strategic direction proposed in this report should be endorsed (or modified) via a) sharing the final report and b) holding a third hui where hui participants can engage with MfE and Statistics NZ to discuss findings and determine next steps.

1 Introduction

Under the Environmental Reporting Act 2015 (the Act), the Ministry for the Environment (MfE) and Statistics New Zealand have an obligation for regular reporting on the state of New Zealand's environment through synthesis and domain reports. The synthesis reports are on a three-year cycle, with a domain report on each of the five domains (air, atmosphere and climate, freshwater, land and marine) produced every six months.

The reports present the human and natural pressures that cause changes to the state of these domains, and the impacts that the state of the environment and changes to the state of the environment may be having on ecological integrity, public health, the economy, culture and recreation, and Te Ao Māori (the impacts) (Environmental Reporting Act 2015).

Environmental impacts that have particular significance for Māori are covered under Te Ao Māori. Reports must be informed by a holistic Māori perspective and capture information that contributes to Māori decision-making and well-being (Environment Aotearoa 2015, p. 18).

The Ministry for the Environment contracted Landcare Research in March 2016 to provide a strategic direction for reporting on Te Ao Māori. The primary deliverable is a set of prioritised measures across the biophysical domains (freshwater, land and marine) on the Māori-related impact topics identified by MfE and shortly to be gazetted as part of the regulatory framework. These topics are mātauranga Māori, tikanga practice and kaitiakitanga; customary use and mahinga kai; sites of significance, including wāhi taonga and wāhi tapu.

1.1 Te Ao Māori

The challenge for MfE and Statistics NZ is in giving full voice to the Māori world view, Te Ao Māori. The perspectives and approaches are quite different to 'Te Ao Pākehā'. While most of the data contained in the environmental reporting series are as relevant to Māori as to other New Zealanders, there is a lack of information that has been collected using a framework embedded in a Māori worldview. That world view and experience is missing.

Māori knowledge, mātauranga, encompasses not only what is known, but how it is known – the way of perceiving and understanding the world, and the values and systems of thought that underpin those perceptions. Mātauranga embraces all that is distinctive about Māori culture and identity (Waitangi Tribunal 2011).

The defining principle is whānaungatanga, kinship, where all the elements of creation within the living and spiritual realms are interrelated. All animate and inanimate elements are infused with mauri (spirit or living essence) and related through whakapapa. Recent settlements between iwi and the Crown are increasingly reflective of this relationship. For example, the 2014 settlement between Whanganui Iwi and the Crown upheld the mana of the Whanganui River, Te Awa Tupua, and recognised the intrinsic ties that bind Te Awa Tupua and its people to each other. Hence, in the Deed of Settlement, Te Awa Tupua is

formally recognised as a legal entity, with its own rights and distinct relationship to the local iwi (Ruruku Whakatupua 2014).

The hierarchies of whakapapa and whanaungatanga bring both rights and obligations, encompassed in another core value, kaitiakitanga. Of all the values, this is most often evoked in policies relating to the natural environment. The notion of kaitiakitanga is frequently used in a one-dimensional sense of 'caring for' or stewardship. It is more profound than that. Everything of importance in Te Ao Māori has a kaitiaki, a spiritual guardian. The crucial concept of kinship embedded within kaitiakitanga explains why iwi and hapū have a duty of care encompassing not only concern for physical wellbeing, but also for mauri (Waitangi Tribunal 2011).

Kaitiaki obligations exist in relation to taonga, treasured things. In the environment, these are readily understood as significant sites, on both land and water, and valued flora and fauna species. However, kaitiaki responsibilities also extend to immaterial values, such as mātauranga and te reo. The use of Māori language in relation to environmental concepts, features and species is thus a key component of Te Ao Māori and affects how the environment is perceived and acknowledged.

Our task is how to reflect and respect all these components of the Māori way of knowing in measures and indicators used for environmental reporting. The selection of a suitable framework to manage both Te Ao Māori perspectives and suitable measures is fundamental to this work.

1.2 Our approach

This work draws upon the considerable expertise of the project team and their networks. In particular, we have been informed by Harmsworth and Awatere (2012), Awatere and Harmsworth (2014), Robb et al. (2015a,b) and Lyver et al. (2016). These works consider that reporting of environmental impacts on Te Ao Māori must reflect the underpinning values of Te Ao Māori but that a given framework may differ according to iwi/hapū needs or the questions that the monitoring is attempting to address.

Given that the reach of Environment Aotearoa is national, the project team has attempted to build a degree of national agreement with the direction and priorities for reporting Te Ao Māori. Therefore, although this report builds in existing knowledge of measures, it has also engaged a wider community through hui on the key things that needed to be measured to reflect Te Ao Māori, their relative importance and approaches to measurement.

2 Objectives

In order to provide MfE with strategic direction for Environmental Reporting of Te Ao Māori, our objectives were:

- to engage a community of Māori active in environmental research/monitoring to identify measures embedded within a Te Ao Māori worldview across three prioritised domains (land, freshwater, marine)

- to use project team knowledge to prioritise the measures
- to identify ways of measuring and data sources/streams.

3 Methodology

We used a mixed methodological approach comprising literature review and hui to inform and develop a relevant Te Ao Māori framework and to 'ground truth' the types of measures that should be prioritised. Engagement with iwi, hapū and experts in mātauranga Māori is acknowledged in the scope as critical to inform the work (Mead 2003, Pipi et al 2004).

Two hui were organised using the networks of both MfE and the project team. Kaumātua, iwi environmental practitioners and resource users, and Māori and Pākehā representatives from central and local government agencies and academia were invited. Most participants were specifically chosen for their familiarity and experience with environmental indicators, or their resource use expertise. Participants are listed in Appendix 1. Whilst the two hui built upon each other, measures have been drawn from both as not all participants were common to both hui.

3.1 Hui 1, Wellington

The aim for the first hui was to develop a shared understanding among participants of the overall context for the work and the terms used, and to come to an agreed framework on how we could best measure impacts on the state of Te Ao Māori.

Catherine Knight, from MfE, presented the legislative framework, to ensure the group understood the constraints as well as the opportunities presented by the Act. A lively discussion ensued, with participants seeking to clarify how topics were selected, the parameters of data collection and use, and benefits that would emerge for Māori through engagement in national environmental reporting.

Garth Harmsworth and Shaun Awatere (Landcare Research) presented overviews of kaupapa Māori frameworks they have used in environmental monitoring and reporting, to show participants ways in which this might be managed.

In the afternoon, participants divided into small groups to deliberate the question:

'What measures would you use to describe your world?'

Single statements of 'measures' were written on notes and put up on the wall, which were grouped by the facilitator Steven Wilson into broadly aligned categories. Towards the end of the day, participants allocated red dots, numbered 1 (lowest) to 5 (highest), to those statements and categories they deemed of highest value or priority.

Subsequent to the hui, responses were further categorised under various Te Ao Māori values and principles drawing on Lyver et al. (2016). It must be noted that few of the responses are 'measures' as defined in the scope. Hence, we categorised them as 'themes'

for further analysis and breakdown into measures at hui 2. See Appendix 2 for a list of all themes from hui 1.

3.2 Hui 2, Rotorua

At this hui, we aimed for a stronger focus on defining measures. Mereana Wilson and Fiona Hodge, MfE, gave another quick overview of the scope, with attention paid to the benefits for Māori of State of Environment reporting.

Steven led a whiteboard exercise on '*What are the characteristics of effective measures?*' This drew out comments on qualitative vs quantitative information, and the importance of mātauranga and 'lived experience' sitting behind the measures.

Most of the session following this exercise was devoted to group work. Each of five tables had a group of Te Ao Māori themes from hui 1 (those in Appendix 2) to work through to meaningful measures. The challenge was to use the criteria of effective measures developed that morning to move themes towards measures (see Appendix 3 for each table's measures).

During this session a consensus emerged amongst the tables that a modified version of an Auckland Council (Treaty-based) framework could be appropriate for organising the measures of Te Ao Māori. This framework is shown in Figure 1.

3.3 Te Ao Māori framework

The framework promotes the Treaty of Waitangi principle of partnership, built on the explicit Treaty premise of Māori and Crown as formal equals, as the overarching framework and mechanism by which State of Environment reporting can ensure proper inclusion of Māori values (Scheele 2015).

Given its kāwanatanga responsibilities, the Crown has the right to govern and enact laws such as the Environmental Reporting Act 2015. However, that right is qualified by the guarantee of full authority for iwi and hapū over their mātauranga and treasured things. Thus, the measures which contribute to upholding Te Ao Māori must originate on this 'right-hand-side' (mana motuhake) of the framework. Iwi and hapū may not have the capacity to supply the data and indicators which support the measures but the priority measures reflect the values of rangatiratanga, kaitiakitanga, and manaakitanga.

We chose the phrase 'mana motuhake' rather than 'tino rangatiratanga' advisedly since it was used in the original framework and in discussion at the hui. Both are clearly related, and refer to self-determination, sovereignty, independence and control over one's own destiny. According to Hawksley and Howson 2011, mana motuhake implies a stronger connection with land and political autonomy than tino rangatiratanga, (and is sometimes synonymous with Tūhoe aspirations for separate sovereignty). A recurring theme amongst participants was having control and the ability to make their own management decisions over natural resources.

Whakapapa (ancestral lineage, genealogical connections, relationships, and links to the natural environment) is an important construct for helping to define priorities for reporting based on a Māori environmental ideology. Whakapapa is more than just ancestral lineage between humans. Whakapapa binds iwi/hapū to the natural environment, ancestral homelands, the wider community, mokopuna or future generations, and empowers mana whenua to carry out their duties as tangata kaitiaki (human guardians) that strengthen those bonds. Implementation of the kaitiakitanga responsibility derived from whakapapa ensures that natural resources are managed in a sustainable manner to guarantee their availability for future generations (Harmsworth and Awatere 2013).

For the purposes of environmental reporting, the whakapapa ideology described above is represented by the five following principles (adapted according to Awatere and Harmsworth 2014)

- **Mana whakahaere** (decision-making authority) is concerned with the effective participation of iwi/ hapū in natural resource management and monitoring. This decision-making right is derived from whakapapa or ancestral connections to an area or natural resource.
- **Tūrangawaewae** (ancestral homelands) refers to the effectiveness of whānau, hapū and iwi identity to be reflected in the natural and built landscape. This connection to an ancestral homeland is based on ancestral lineage and occupation by iwi/hapū/whānau to an area or site.
- **Whanaungatanga** (community connectivity) refers to how well whānau, hapū and iwi well-being and social prosperity is improved through their connection to, and interactions with, the natural environment.
- **Taonga tuku iho** (intergenerational resources) is concerned with how effective whānau, hapū and iwi are in actively utilising kaitiakitanga to manage natural resources and whether these practices are being transferred between generations. To actively implement kaitiakitanga for the sustainable management of ngā taonga tuku iho requires the recognition of whakapapa to an area or natural resource.
- **Te ao tūroa** (the natural environment) is concerned with how well whānau, hapū and iwi are sustainably harvesting ngā taonga tuku iho for physical and spiritual sustenance. Sustainably harvesting ngā taonga tuku iho requires access and use rights derived in part from whakapapa.

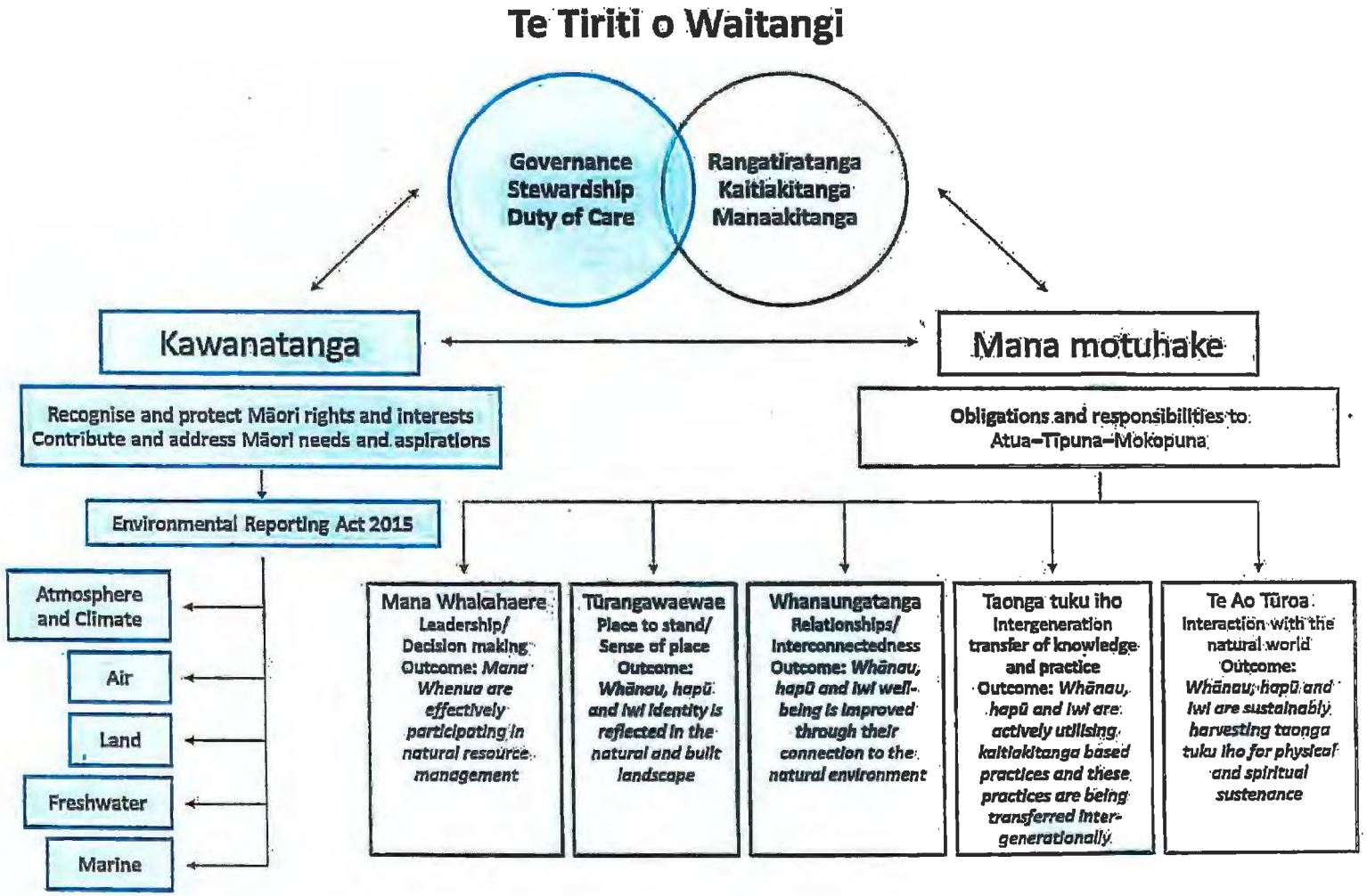

Figure 1 Framework proposed by Johnnie Freeland (Auckland Council) and adapted according to Awatere and Harmsworth 2014

3.4 Post-hui prioritisation of measures and inventory of data

The project team took themes and measures from both hui 1 and 2 and aligned them with the five principles of mana motuhake associated with the framework (Appendix 4). Measures were then prioritised according to the criteria given in the Results section below. From here, an inventory was undertaken of whether data are pre-existing and compiled, pre-existing but requiring recompilation or similar, and data that would need to be commissioned. This process resulted in further prioritisation according to 'data readiness' and enabled us to suggest a starting set of measures for which rapid progress could occur.

4 Results

4.1 Characterisation of measures

The hui participants (hui 2) came up with the following *characteristics* of appropriate measures:

- Spatially defined
- Repeatable
- Aggregated across rohe (not unanimous)
- Meaningful and relevant to the decision-maker
- Defined parameters (could be layered into priorities).

It was agreed that both quantitative and qualitative measures of Te Ao Māori were possible. Some participants thought that the same person needed to take the measurement and perform the analysis; others felt that only tangata whenua were capable of making the measurements and needed sufficient resourcing to do so. Many participants felt that measures needed to be visually represented and others said that measures needed to relate to kawa (how things are done), and be able to reflect changes in tikanga, and ongoing aspirations, trends and authenticity in the Māori world. See Appendix 5 for an 'as drawn' list of the hui characteristics of measures.

The Ministry for the Environment has stressed that measures need to be 'realistically measurable' and 'relate directly to the environment'. Statistics New Zealand has clear criteria for rating the quality of available data for reporting, and determining whether it can be used as a national indicator, a case study, or supporting information; relevance and accuracy are key (Statistics NZ 2007). Therefore, assignment of measures as suitable for national indicator, case study or supporting information falls outside the scope of the current study.

The project team considered hui participants' characteristics and those of the Ministry to settle on the following criteria for *prioritising* the measures:

1) Meaningful to Māori
2) National (where possible)
3) Realistically measurable
4) Repeatable
5) Data already exist (where possible)
6) Concern the environment directly.

4.2 Prioritised measures

The project team settled on a group of measures that reflect each of the domains with some cross-domain measures relating to governance (Table 1). The measures were chosen to reflect the core values of rangatiratanga and kaitiakitanga, and seek to enhance whanaungatanga with taonga in the natural world. We are aware that not all suggested measures can be reported under the Environmental Reporting Act 2015 as they do not measure the environment directly. Nonetheless, given their centrality to Te Ao Māori, they are reported here as essential components of this worldview. We have indicated those measures as not able to be reported under the Act. They are still relevant to other areas of Ministry policy work.

4.2.1 Measures reflecting mana whakahaere

None of these measures can be reported under the Act but the principle is critical to Te Ao Māori. For example, a cornerstone of mana whakahaere is the **active participation of Māori in resource management decision-making.** This relates to the inseparability of the people from the land/water/stars via whakapapa. Hui participants strongly endorsed the sentiment from one table, 'Mana whenua = mana motuhake = kaitiakitanga', summed up by the facilitator as, 'If we're good, the environment is good'. We note that the Local Government Act (2002, Part 6, 81) requires councils to establish and maintain processes to provide opportunities for Māori to contribute to the decision-making processes of the local authority and to foster the development of Māori capacity to do so. Some councils have been especially proactive. Auckland Council works closely with the Independent Māori Statutory Board who produced 'The Māori Plan for Tāmaki Makaurau'. This plan has a specific goal of Māori being 'actively involved in decision-making and management of natural resources' within the environmental area of 'rangatiratanga' (an underpinning value of the Plan). Further, they list indicative indicators of 'kaitiakitanga' as including 'number of iwi management plans in Tamaki Makaurau' and 'number of full time equivalents employed by iwi/hapū in resource management'.

Given the desire for hui participants to see action for the environment (currently sits outside the Environmental Reporting Act 2015), other Ministry policy work should consider maintenance, degradation or enhancement of specific iwi/hapū values and measures and progress towards (or away from) iwi/hapū aspirations (outcomes).

Table 1 Prioritised measures organised by mana motuhake principles with data that could be used to measure Te Ao Māori and whether this exists already

Principles	Domain	Measure and method	Data owners / providers	Does data exist?	Willingness to share (Definitely, Highly likely, Likely, Unlikely)	Ability to report on under the Environmental Reporting Act 2015
Mana whakahaere	Cross-domain	*Active participation of Māori in resource management decision making, indicated by:* • number of Māori city/district/regional council members	Territorial Authorities Ministry of Justice	Yes – via Department of Internal Affairs and Local Government New Zealand.	Definitely	No; but can be considered under other Ministry policy streams.
	Cross-domain	*Active participation of Māori in resource management decision making, indicated by:* • number of iwi environmental management plans	Iwi authorities	Yes – Nationally commissioned survey required.	Highly likely	No; but can be considered under other Ministry policy streams.
Tūrangawaewae	Land	*Changes of Māori land use, indicated by:* • temporal land-use maps showing Māori freehold land contrasted with other tenures	Landcare Research Land Cover Database (LCDB) Ministry of Justice Māori Land online Ministry for the Environment Land Use Map (LUM) Landcare Research Whenua Viz	Yes – LCDB data openly available 1996, 2001/02, 2008, 2012/14 https://lris.scinfo.org.nz http://www.maorilandonline.govt.nz/gis/home.htm https://data.mfe.govt.nz/layer/2375-lucas-nz-land-use-map-1990-2008-2012-v0016/ http://whenuaviz.landcareresearch.co.nz/ Note WhenuaViz has not been updated since 2011.	Definitely	Yes
	Land/ Freshwater	*Natural habitat fragmentation, indicated by:* • wetland extent	1) Wetland delineation tool and Freshwater Ecosystems of New Zealand database (FENZ) 2) Landcare Research Land Cover Database (LCDB)	1) Yes FENZ plus: http://www.landcareresearch.co.nz/science/plants-animals-fungi/ecosystems/wetland-ecosystems 2) Yes – LCDB could be used to characterise contiguity LCDB data openly available 1996, 2001/02, 2008, 2013/14 https://lris.scinfo.org.nz	1) FENZ and wetland delineation tool – Highly likely 2) LCDB – Definitely	Yes
	Land	*Mauri of wāhi tāonga, affected by impact of visitors, indicated by:* • number of visitors	1) DOC 2) Territorial Authorities 3) Heritage New Zealand	1) Yes – Nationally commissioned survey required. 2) Yes – Nationally commissioned survey required. 3) Yes – http://www.heritage.org.nz/the-list	1) Highly likely 2) Highly likely 3) Highly likely	Yes
	Land	*Mana whenua indicated by:* • bilingual signage and interpretation at conservation reserves	1) DOC 2) Territorial Authorities	1) Yes – Nationally commissioned survey required 2) Yes – Nationally commissioned survey required	1) Highly likely 2) Highly likely	No; but can be considered under other Ministry policy streams.
Whanaungatanga	Marine/ Freshwater	*Ability to access mahinga kai indicated by:* 1) abundance of shellfish and inshore fish species (e.g. pāua, kina) 2) abundance of tuna, whitebait and other freshwater species 3) abundance of tiō (harvest)	1) NZ Fisheries Assessment Reports, MPI, Dept of Marine Science – Otago Uni, NIWA 2) NIWA New Zealand Freshwater Fish Database 3) Rākūra whānau via iwi	1) Yes – Openly available 2) Yes – Openly available but specific analyses may need to be commissioned. 3) Yes – Data confidential	1) Definitely 2) Definitely 3) Unlikely.	Yes

			Island Administering Body, Rakiura Titi Islands Committee			
	Land Freshwater Marine	*Ability to provide traditional food for hui, wānanga, and tangihanga, indicated by:* • proportion of food items that are traditional mahinga kai or kai moana species	Rūnanga and marae	Yes – Nationally commissioned survey with rūnanga or marae required	Likely	Yes
	Marine (applies to other domains also but Method of Measure not given here)	*Ability to provide traditional food for hui, wānanga, and tangihanga, indicated by:* • number of customary fishing permits authorised by rūnanga	1) Ministry for Primary Industries 2) Rūnanga – Customary fisheries officers	1) Yes – Data request to MPI required 2) Yes – Nationally commissioned survey with rūnanga required	1) Highly likely 2) Likely	No, but can be considered under other Ministry policy streams.
	Land	*Ability to gather and use rongoā plants, indicated by:* • distribution, abundance of selected plant species such as koromiko, kōkōmuka, kawakawa, mānuka and harakeke	1) Landcare Research National Vegetation Survey (NVS) databank 2) DOC Tier-1 vegetation data 3) NZ Plant Conservation Network (NZPCN)	1) Yes – Request for data required but specific analyses would need to be commissioned: https://nvs.landcareresearch.co.nz 2) DOC Tier-1 database. Specific analyses would need to be commissioned. 3) Yes – Openly available	1) Highly likely 2) Highly likely 3) Definitely	Yes
Taonga tuku iho	Land	*Ability to find sufficient quantities of useable leaves, indicated by:* • distribution and abundance of pīngao, kuta and kiekie	1) Landcare Research NVS databank 2) Dune Restoration Trust	1) Yes – Request for data required but specific analyses would need to be commissioned: https://nvs.landcareresearch.co.nz/ 2) Yes – Coastal Reference Database http://www.dunestrust.org.nz/	1) Highly likely 2) Definitely	Yes
	Land	*Ability to find sufficient quantities of useable leaves, indicated by:* • number of permits issued for customary harvest in reserves	1) DOC 2) Territorial Authorities	1) Yes – Nationally commissioned survey required 2) Yes – Nationally commissioned survey required	1) Highly likely 2) Highly likely	Yes
	Freshwater	*Quality of rivers, streams, and lakes indicated by:* • drinkability and swimmability	1) Ministry for the Environment 2) Parliamentary Commissioner for the Environment	1) Yes – Request for data required via the National Objectives Framework. 2) Yes – Request for data required	1) Definitely 2) Definitely	Yes
	Freshwater	*Quality of rivers, streams, and lakes indicated by:* • health of aquifer and number of freshwater springs	1) Land, Air, Water Aotearoa 2) FENZ	1) Yes – Request for data required via www.lawa.org.nz/ or National Objectives Framework under NPS-Freshwater Management (MfE) 2) Yes – Request for data required via Geodatabase.	1) Highly likely 2) Highly likely	Yes
	Cross-domain	*Number of native speakers of te reo, indicated by:* • recorded fluency of speakers	Statistics NZ	Yes – Openly available from census data	Definitely	No, but can be considered under other Ministry policy streams.
	Cross-domain Land (rongoā)	*Census of practitioners and tohunga for selected expertise, indicated by:* • number of people skilled in use of maramataka	1) Iwi/hāpu/ whānau 2) Ministry of Health (for funded rongoā clinics)	1) No – Nationally commissioned survey required 2) Yes – Request for data required; indicative only as clinics represent only a small proportion of total rongoā practitioners	1) Likely 2) Highly likely	No, but can be considered under other Ministry policy streams.

	Land	• number of active practitioners of rongoā *Census of weavers and carvers, indicated by:* • number of wānanga relating to carving and weaving	1) NZQA statistics 2) Te Puia 3) Iwi authorities	1) Yes – Request for data required 2) Yes – Request for data required 3) No – Nationally commissioned survey required	1) Highly likely 2) Likely 3) Likely	No, but can be considered under other Ministry policy streams
Te Ao Tūroa	Land	*Can environment support healthy populations of valued bird species abundance of taonga manu species, indicated by census of:* • kererū, kiwi (others will be of regional significance)	1) Garden Bird Survey (Landcare Research) 2) DOC 3) Ornithological society citizen science database	1) Yes – but not nationally representative. Strong bias to urban centres. 2) Yes – DOC Tier 1 database (nationally representative). 3) Yes – Data request required (not nationally representative): http://nzor.org.nz/child/1	1) Definitely 2) Highly likely 3) Definitely	Yes
	Land Marine Freshwater	*Effect of pests and diseases on taonga species, indicated by:* • reporting spread, occurrence of phytoplasma (yellow-leaf) diseases on taonga plant species such as harakeke, cabbage trees and other native plants • reporting spread of kauri dieback • reporting spread of selected exotic species which threaten native species and waterways such as carp, Asian paddle crab and myrtle rust (when it arrives) on mānuka, pōhutukawa, rātā • reporting (positive) impact of new control measures (Vespex) on German and common wasps	1) Ministry for Primary Industries 2) Territorial Authorities	1) Yes – Data request required 2) Yes – Data request required	1) Highly likely 2) Highly likely	Yes
	Land	*Availability of wild food, indicated by:* • wild food availability assessed by abundance of exotic animal species (e.g. feral pigs, deer) • wild food availability assessed by abundance of exotic plant species (e.g. wātakirihi (watercress) or pōhā (sow thistle))	DOC	1) DOC Tier 1 vertebrate data for deer (not reported for pigs thus far but report could be commissioned). 2) DOC Tier 1 vegetation data – includes all land covers so will pick up wetland/seep occurrences	Definitely	Yes
	Atmosphere and climate Land Freshwater	*Impacts of climate change, indicated by:* • frequency and intensity of storm events • effect of coastal erosion and sea-level rise on significant cultural sites • timing of inanga (īnaka) spawning • timing and frequency of flowering	1) NIWA 2) NIWA 3) NIWA 4) Some data with NZPCN, NatureWatch, DOC, cabbage tree records at LR	1) Yes – data available but specific analyses may need to be commissioned if outside Ministry for the Environment/Royal Society NZ reports: http://www.royalsociety.org.nz/media/2016/05/climate-change-implications-for-NZ-2016-report-web.pdf 2) NIWA – to be commissioned 3) To be commissioned 4) To be commissioned	1) Definitely 2) Definitely 3) Likely 4) Likely	Yes
	Atmosphere and climate Air	*Human activities affecting darkness indicated by:* • darkness – ability to observe stars and tikanga relating to maramataka and Matariki	Territorial Authorities www.lightpollutionmap.info/	Yes – Data request required	Highly likely	Yes

4.2.2 Measures reflecting Tūrangawaewae

Land in New Zealand has gone through transformative change since humans arrived 800 years ago, particularly since European settlement in the 19th century. Only one-third of forest remains, mainly in upland and mountainous areas, and once vast wetlands have been reduced to 10 per cent of their original extent. Agriculture (increasingly intensive) and horticulture occupy about 42 per cent of the land and plantation forestry a further 7.5 percent (MfE 2015). Land confiscation, changes in use and management, reduced and degraded habitats for native species, and limited access to customary resources have had, and continue to have, a profound effect on Te Ao Māori and the reflection of whānau, hapū and iwi identity in the natural and built landscape.

With an increased number of Treaty settlements, including return of lands to Māori ownership along with financial compensation, the timing is good to include a reporting measure on **changes of Māori land use**. Land is integral to Māori well-being and critical to Māori economic development. Currently over 70 per cent of Māori land is classified as erodible hill country while less than 30 per cent is suitable for intensive agriculture, cropping and horticulture (Harmsworth et al. 2010). Land use mapping will show changing patterns of tenure and utilisation over time, with potential improvements in land use reflecting settlement outcomes. We note that lands in tenures other than "Māori freehold land" impact on Māori freehold land and are also of wider interest with respect to achieving Māori land use aspirations.

The ecological and cultural health of **wetlands** is vital to Māori identity and well-being. Wetlands improve water quality, provide a breeding ground and habitat for eel, fish and birds, and are an essential source of mahinga kai, including weaving plants. Thus, monitoring trends in wetland loss or stabilisation is of interest and value to Māori.

Records of both wāhi tapu and **wāhi taonga** exist in national heritage registers (http://www.heritage.org.nz/the-list) or in district and regional plans to help improve the protection and management of cultural sites. Information on wāhi tapū, however, is mostly highly confidential and not suitable to use as a reporting measure. However, some wāhi taonga, such as battlegrounds of the Land Wars or the better-known springs and hot pools, are sites of 'cultural tourism'. With tourism numbers burgeoning, we consider **'number of visitors'** a useful measure to help identify where increased crowds may be affecting the mauri of special areas. Examples where visitor numbers are recorded are Waikoropupū Springs (DOC) and Waihou (Blue) Springs (South Waikato District Council).

We acknowledge hui participants' concern at the impoverishment of te reo Māori and the drastic loss of kupu to describe the environment, including flora, fauna and natural features. A measure requested during the hui to show mana whenua and the importance of te reo in interpreting the local environment was to record **bilingual signage** and interpretation at conservation reserves. We include this in the table of measures to help inform policy, but it is out of scope under the Environmental Reporting Act 2015.

4.2.3 Measures reflecting Whanaungatanga

The principle of whanaungatanga emphasises how the well-being and prosperity of whānau, hapū and iwi are improved through their connection to and interactions with the natural environment. In our hui discussions, the themes and measures most to the fore related to abundance and access to mahinga kai, both marine and freshwater, rongoā plants and the ability to fulfil one's obligations as a host.

We sought ways to measure the **ability to provide traditional food** for events such as hui and tangihanga. Some marae keep records of gifted food so it could be possible to commission a survey on this at, for example, ten-twenty marae throughout New Zealand for the type and abundance of traditional food items provided. Although records should also be available for another proposed measure – **number of customary fishing permits issued** (anecdotal evidence suggests there are fewer now than previously because of declining fish stocks) – this is out of scope under the Act.

With the majority of iwi and hapū having access to the sea, the **ability to provide kai moana** for the table is a fundamental part of Māori cultural identity and practice. Yet statistics on abundance of marine fish and shellfish are problematic. Dr Chris Hepburn, a marine biologist (University of Otago) and a hui participant, advised that the New Zealand Fisheries Assessment reports are not a good data source to report on the status of fisheries important for Māori communities and customary harvest. It is a question of scale. Catch data from commercial fishers are not necessarily applicable to local, inshore fisheries. Catch data on species of interest, such as pāua, kina, pipi and inshore fin fish, are poorly known. For instance, University of Otago data show sustained decline of a key local pāua fishery yet this is not born out in broader statistics for the region.

McCarthy et al. (2014) assessed the relative significance of important seafood species among different stakeholder groups. The common view among the 100 study participants was that access to important inshore seafood species had become more difficult during the course of their lifetime, with marked declines occurring from the 1970s onwards. Even where food species are present, they are typically harder to obtain, take longer to harvest and/or require expensive gear. Quantitative analysis revealed that pāua, tuna (eel) and tītī were of particular significance to Māori stakeholders. Furthermore, Māori associated the depletion of pāua with a loss of cultural identity, hospitality, tradition, practices, emotional and spiritual connection to their environment. This study's assessment of key marine species was echoed by hui participants.

Kaitiaki lament the loss of fisheries and tikanga. Currently, the fisheries management system is not structured to protect fisheries at a scale relevant to kaitiaki. There is an opportunity here for reporting indicators to provide that information and tell the story of what is happening. Otago University, for instance, has 10 years of metrics on key species – pāua, kina, tuaki (cockles), tua tua, blue cod, flounder and tuna – and their habitat, particularly reef and seaweed. We suggest that pāua and kina could be advanced first as species of national importance and that further refinement of other species, especially the inshore fish species is required – priorities will vary by rohe.

Freshwater species are similarly treasured. Tuna (eels), īnanga (whitebait), freshwater kōura (crayfish), kanakana (lampreys) and kākahi (freshwater mussels) featured in hui discussions. Whilst tuna and īnanga/īnaka are of national significance, the relative importance of other species will vary by rohe. The Waikato River Independent Scoping Study (NIWA 2010) highlights taonga species and gives metrics on their abundance, distribution and condition. While each river iwi throughout New Zealand has its own special relationship and association with particular species, there are many species in common that could form part of a national survey.

The **ability to gather rongoā plants** is equally essential to the health and well-being of whānau, hapū and iwi. Different environmental conditions from north to south obviously determine the availability and abundance of particular species and there are very many plants that could be surveyed. We chose species highly regarded for rongoā, (see, for instance, Riley 1984 and Ko Aotearoa Tenei 2011), and that are widespread in New Zealand. Note that mānuka as a species is highly variable (genetically and phenotypically) throughout New Zealand – only non-cultivar forms will be of interest.

4.2.4 Measures reflecting Taonga Tuku Iho

A major concern of Māori, reflected in hui discussions, is reduced ability to actively carry out their role as kaitiaki of natural resources. As one participant said 'whenua is our identity'. Arguably the greatest concern (as for many New Zealanders) is the diminished water quality of rivers, streams and lakes. For Māori, there is deepened resonance with cultural health and identity so dependent on using waterways for mahinga kai. There are a lot of data already available on the state of and pressures on freshwater. Hui participants sought data and analysis specifically on **drinkability and swimmability, the overall health of the aquifer and number of freshwater springs.**

Mahinga kai includes **weaving resources.** The last two decades have seen a revitalisation of both traditional weaving and the use of natural materials in contemporary art. However, while harakeke is often cultivated it is not always easy for weavers to access suitable supplies (quantity and quality) of other prized resources such as pīngao (*Ficinia spiralis*), kiekie (*Freycinetia banksii*) and kuta (*Elaeocharis sphacelata*). Our suggested measures relate to **distribution, abundance and access** to plants in reserves.

Taonga tuku iho also concerns the ongoing transmission of tikanga and knowledge through the generations. Hence, hui participants sought a census of experts in weaving and carving, in the use of maramataka (the Māori calendar), and the **number of active and skilled practitioners** of rongoā. These measures are out of scope under the Environmental Reporting Act but should be noted to inform future policy.

Every working group at the hui talked about the vital importance of te reo Māori. Participants were very clear that the lack of fluent speakers and loss of local dialects and a narrowing of environmental kupu (words) have real impact on how the environment is perceived and acknowledged. For example, the nature of karanga, which often took inspiration from the environment, is changing. If you can't speak of it, you can't really know it. One person suggested that improving knowledge about the environmental domains

would improve te reo in expressing the domains, which in turn would improve the state of te reo Māori. Currently, metrics such as a census of native speakers of te reo (those who would have the words to express features and concepts of the natural world) are out of scope, but should be noted as a consideration for future policy.

4.2.5 Measures reflecting Te Ao Tūroa

Measures under Te Ao Tūroa concern the health of natural resources and their sustainable harvest. Hui participants were concerned for the state of the ngahere and the **ability of the environment to support healthy populations of birds.** The measure prioritised was the abundance and distribution of the nationally distributed bird species – kererū/kūkupa (*Hemiphaga* spp.) and kiwi (*Apteryx* spp.). Other species should be considered further even if not taonga species for all iwi, such as kākā (*Nestor meridionalis meridionalis*), tītī (*Puffinus griseus*) and weka (*Gallirallus australis*). The focus should be species which are valued for feathers or food (including gift exchange outside a rohe, common with tītī) and where appropriate data sources exist.

Not all valued resources are native species. The **availability of wild food** is important to whānau and hapū, and a suggested indicator is the abundance of **deer and feral pigs.** Data exist for both deer and pig abundance on public conservation land, although the latter has not yet been reported on. Two long-established, exotic vegetables are also widely used and have become part of Māori cultural identity – pūhā (*Sonchus* spp.) and watercress (*Nasturtium officinale*). Safe sources of watercress, in particular, are harder to find in the wild, because of reduced wetlands, fewer clean waterways (ditches), pollution such as weed sprays used on farms, and issues over access onto private land. The ability to gather food from the wild is hugely cherished as part of Te Ao Māori and provides a useful measure of environmental impact.

Pests and diseases impact on the health of taonga species. Although a native species, the disease caused by '*Candidatus* Phytoplasma australiense' seriously affects harakeke, tī kōuka, and increasingly other native plants, and data on distribution and spread over time and space may provide knowledge on how to manage the worst effects. Many exotic pests pose a substantial risk to native flora and fauna, on land (insect pests and rusts on plants), in freshwater (e.g. carp), and in the sea (e.g. the aggressive Asian paddle crab, *Charybdis japonica*). The latter is present in some Northland estuaries, competes for food and space with native crabs, eats shellfish and is a threat to marine farming. Many freshwater invasive algae such as didymo (*Didymosphenia geminata*) and lake snot (*Cyclotella* spp.) are already being monitored and recorded as a general nuisance in waterways. One serious threat with particular relevance to Māori taonga species is myrtle rust, which will affect mānuka (*Leptospermum scoparium*), rātā and pōhutukawa (*Metrosideros* spp.). Although this rust has not yet arrived in New Zealand, it is expected to, and we suggest that as soon as it does, data relating to its distribution and spread should become part of environmental reporting.

There is an excellent opportunity now to record data on the impact of the newly introduced poison Vespex on wasp populations. German and common wasps spoil people's enjoyment of the outdoors and impact on beekeeping, horticulture, forestry and tourism – all activities that contribute to Māori economic success. Crucially, wasps upset the ecological balance of

native ecosystems and affect the food sources of native birds, particularly tūī, bellbirds and kākā.

Vespex is a significant advance in wasp control and we suggest that the effects could be monitored and form part of national environment reporting. Doing so in the realm of Te Ao Māori arguably brings a deeper resonance to the information.

The impacts of climate change affect all New Zealanders, but there are ways in which the frequency and intensity of storm events, coastal erosion and sea-level rise have particular impact on Te Ao Māori. One suggested measure/indicator is the effect on early **settlement sites** on the coast, which are a fundamental part of Māori (and New Zealand) cultural heritage. Sea temperature rise, ocean acidification and the effects of sediment loading from the land on marine fisheries and habitats are already reported on, but their particular impact on Māori communities and taonga species (pāua, kina, pipi, tuaki) could be highlighted in the marine domain report.

We also suggest commissioning work to record trends and changes in the **timing of īnanga spawning** and **timing and frequency of flowering** of selected species. Some data will exist. For instance, Landcare Research has kept flowering records from cabbage tree experimental sites in Auckland, Lincoln and Mosgiel since 1994.

Also related to the air domain, is to record the effect of human activities, especially lighting, on the **night sky – darkness** and the ability to observe stars and tikanga relating to maramataka and Mātariki (Abbari 2013). This measure would require further scoping.

4.3 Inventory of data availability and relationship to impact topics

We have identified that many data already exist that can indicate environmental impact on Te Ao Māori (Table 1). However, many of the datasets would need to be reanalysed in a form that is fit-for-purpose to directly reflect Te Ao Māori. Although the entire suite of prioritised measures given in Table 1 is required to adequately capture change across the five principles of Te Ao Māori, more rapid progress can be made with some measures than others. Therefore, we provide the measures below, ordered by domain and prioritised according to data existence and likely speed of progress (Table 2).

Further, we show potential alignment to the Māori-related impact topics identified by MfE for national environmental reporting. These topics are:

- mātauranga Māori; tikanga practice and kaitiakitanga
- customary use and mahinga kai
- sites of significance, including wāhi taonga and wāhi tapu.

Mātauranga Māori is a term that describes the body of knowledge originating from Māori ancestors (tūpuna) including the Māori world view and perspectives (Te Ao Māori), Māori creativity and cultural practices (Coffin 2015). It embraces individual, local, and collective knowledge, Māori values, cultural expressions, perspectives, observations, being traditional, historical and contemporary (Harmsworth et al. 2002; NIWA 2010; Awatere & Harmsworth

2014; Coffin 2015). Although mātauranga Māori informs everything as a body of knowledge for perspectives, values, practices, and taonga across domains, some priority measures can be primarily aligned alongside the other impact topics as well.

Table 2 Measures arranged by domain, with impact topic and state of data for use in environmental reporting. Note that data availability could be used to prioritise the measures with data ranked a) indicating current availability and needing no or only minor recompilation; b) indicating data exists but further synthesis is required; c) indicating analysis would need to be commissioned but some or all of the data is thought to be currently available; d) indicating further refinement to scope and exact data to be collected is required before using in environmental reports.

Domain	Principles	Impact topic/s	Measure and method	Data availability
Cross-domain	Mana Whakahaere	Mātauranga Māori, tikanga practice and kaitiakitanga	*Active participation of Māori in resource management decision-making.* Can't be used under Environmental Reporting Act 2015 but can be enacted in other areas of MfE policy	
Cross-domain	Taonga Tuku Iho	Mātauranga Māori, tikanga practice and kaitiakitanga	*Number of native speakers of te reo, indicated by:* census data on number of speakers Can't be used under Environmental Reporting Act 2015 but can be enacted in other areas of MfE policy	
Atmosphere and climate Air	Te Ao Tūroa	Mātauranga Māori, tikanga practice and kaitiakitanga	*Human activities affecting darkness indicated by:* darkness – ability to observe stars and tikanga relating to maramataka and Matariki	d) Further refinement of scope required prior to commission
Atmosphere and climate Land Freshwater	Te Ao Tūroa	Mātauranga Māori, tikanga practice and kaitiakitanga Sites of significance including wāhi taonga and wāhi tapu. Customary use and mahinga kai	*Impacts of climate change, indicated by:* • frequency and intensity of storm events • effect of coastal erosion and sea-level rise on significant cultural sites • timing of inanga (īnaka) spawning • timing and frequency of flowering/fruiting	d) Further refinement of scope required prior to commission d) Further refinement of scope required prior to commission c) Clear scope so could be commissioned directly c) Clear scope so could be commissioned directly

Domain	Principles	Impact topic/s	Measure and method	Data availability
Land Freshwater Marine	Te Ao Tūroa	Customary use and mahinga kai	*Effect of pests and diseases on taonga species, indicated by:* • reporting spread, occurrence of phytoplasma (yellow-leaf) diseases on taonga plant species such as harakeke, cabbage trees and other native plants • reporting spread of kauri dieback • reporting spread of selected exotic species which threaten native species and waterways such as carp, Asian paddle crab • reporting before and after impacts of new control measures (e.g. Vespex) on German and common wasps	c) Clear scope so could be commissioned directly
Land Freshwater Marine	Whanaungatanga	Customary use and mahinga kai	*Ability to provide traditional food for hui, wānanga, and tanglhanga, indicated by:* • proportion of food items that are traditional mahinga kai or kai moana species	c) Clear scope so could be commissioned directly
Land	Tūrangawaewae	Mātauranga Māori, tikanga practice and kaitiakitanga	*Changes of Māori land use, indicated by:* • land-use maps through time	b) Data exist but need to be recompiled
Land	Tūrangawaewae	Sites of significance including wāhi taonga and wāhi tapu	*Mauri of wāhi taonga, affected by impact of visitors, indicated by:* • number of visitors	c) Clear scope so could be commissioned directly

Domain	Principles	Impact topic/s	Measure and method	Data availability
Land	Tūrangawaewae	Mātauranga Māori, tikanga practice and kaitiakitanga	*Mana whenua indicated by:* • bilingual signage and interpretation at conservation reserves Can't be used under Environmental Reporting Act 2015 but can be enacted in other areas of MfE policy	
Land	Whanaungatanga	Customary use and mahinga kai	*Ability to gather and use rongoā plants, indicated by:* • distribution, abundance of selected plant species such as koromiko, kokomuka, kawakawa, mānuka and harakeke	c) Clear scope so could be commissioned directly
Land	Taonga Tuku Iho	Customary use and mahinga kai	*Ability to find sufficient quantities of useable leaves, indicated by:* • distribution and abundance of pīngao, kuta and kiekie	c) Clear scope so could be commissioned directly
Land	Taonga Tuku Iho	Customary use and mahinga kai	*Ability to find sufficient quantities of useable leaves, indicated by:* • number of permits issued for customary harvest in reserves	b) Data exist but need to be recompiled
Land (rongoā)	Taonga Tuku Iho	Customary use and mahinga kai	*Census of practitioners for selected expertise indicated by:* • number of people skilled in use of maramataka • number of active practitioners of rongoā Can't be used under Environmental Reporting Act 2015	

Domain	Principles	Impact topic/s	Measure and method	Data availability
			but can be enacted in other areas of MfE policy	
Land	Taonga Tuku Iho	Mātauranga Māori, tikanga practice and kaitiakitanga	*Census of weavers and carvers, indicated by:* • No. of wānanga relating to carving and weaving Can't be used under Environmental Reporting Act 2015 but can be enacted in other areas of MfE policy	
Land	Te Ao Tūroa	Mātauranga Māori, tikanga practice and kaitiakitanga	*Can environment support healthy populations of valued bird species? Abundance of taonga manu species, indicated by census of:* • kererū, kiwi	a) Could be reported with very little re-analysis using DOC Tier 1 data where available
Land	Te Ao Tūroa	Customary use and mahinga kai	*Availability of wild food, indicated by:* • wild food availability assessed by abundance of exotic animal species (e.g. feral pigs, deer) • wild food availability assessed by abundance of watercress and pūhā	a) Could be reported with very little re-analysis for deer (pigs not yet analysed) b) Data exist but need to be recompiled
Freshwater	Tūrangawaewae	Customary use and mahinga kai	*Natural habitat fragmentation, indicated by:* • wetland extent	a) Could be reported with very little re-analysis

Domain	Principles	Impact topic/s	Measure and method	Data availability
Freshwater	Taonga Tuku Iho	Sites of significance including wāhi taonga and wāhi tapu Customary use and mahinga kai	*Quality of rivers, streams, and lakes indicated by:* • drinkability and swimmability	a) Could be reported with very little re-analysis.
Freshwater	Taonga Tuku Iho	Sites of significance including wāhi taonga and wāhi tapu Customary use and mahinga kai	*Quality of rivers, streams, and lakes indicated by:* • health of aquifer and number of freshwater springs	a) Could be reported with very little re-analysis
Freshwater Marine	Whanaungatanga	Customary use and mahinga kai	*Ability to access kai moana indicated by:* • abundance of shellfish and inshore fish species (e.g. pāua, kina) • abundance of tuna, whitebait and other freshwater species • abundance of tītī (harvest)	a) Could be reported with very little re-analysis a) Could be reported with very little re-analysis d) Further refinement of scope required prior to commission
Marine	Whanaungatanga	Customary use and mahinga kai	*Ability to provide traditional food for hui, wānanga, and tangihanga, indicated by:* • number of customary fishing permits authorised by rūnanga Can't be used under Environmental Reporting Act 2015 but can be enacted in other areas of MfE policy	

5 Conclusions

The primary deliverable in this project was to identify a set of prioritised measures across the biophysical domains (freshwater, land and marine). Through extensive consultation, literature review and two national hui, we have organised provisional measures according to the Te Ao Māori framework given in the Results section. This provides an environmental reporting template for Te Ao Māori across five main principles:

- Mana whakahaere (Leadership, Decision-making);
- Tūrangawaewae (Place to stand, Sense of place);
- Whanaungatanga (Relationships, Interconnectedness);
- Taonga tuku iho (Intergenerational transfer of knowledge and practice);
- Te Ao Tūroa (Interaction with the natural world).

Using this framework a set of measures has been developed and prioritised. Māori-related impact topics can be reported on through these prioritised measures, both quantitatively (e.g. metrics, statistics) or qualitatively (e.g. case studies, narratives, commentaries).

Components of measures for which there are likely to be sufficient data available for immediate to near-term reporting are:

- Wetland extent
- Abundance of a) shellfish and in-shore fish species (e.g. pāua, kina)
  b) tuna, whitebait (and other freshwater species)
- Water drinkability and swimmability
- Health of aquifers and number of freshwater springs
- Abundance of taonga manu using DOC Tier 1 data where possible (kererū, kiwi)
- Wild food availability assessed by abundance of exotic animal and plant species (DOC Tier 1 data).

6 Recommendations

A number of recommendations are given:

- A cross-domain (cross-provider) technical advisory group should be established by MfE to further refine and order the priority measures for their successful interpretation. The TAG should include members able to advise on availability and suitability of data to meet SoE reporting requirements as well as ensuring measures and indicators are meaningful to Māori.
- Further scoping of the suitability of existing data (such as inshore fish records) should be done before reporting on the specific species listed here.

- Iwi/hapū have a keen and enduring interest in assessing the mauri of their natural environment. Future environmental monitoring and reporting needs to be embedded into regional SoE monitoring programmes with the active participation of local iwi/hapū.
- To be consistent with best practice, the project team suggests that the strategic direction proposed in this report should be endorsed (or modified) via a) sharing the final report and b) holding a third hui where hui participants can engage with MfE and Statistics NZ to discuss findings and determine next steps.

7 Acknowledgements

First and foremost, we acknowledge the generous donation of time and insight from all hui participants who travelled from all over the country and brought their considerable depth of experience to the kaupapa. Second, we acknowledge the assistance given by Auckland Council that has resulted from its own planning processes. We particularly acknowledge the framework presented to the hui by Johnnie Freeland and accepted by hui participants as a good basis for establishing the relationship between Crown reporting on the Environment and Te Ao Māori. Further, we acknowledge Dr Chris Hepburn (University of Otago), and Nigel Scott (Te Rūnanga o Ngāi Tahu) for input on marine priorities.

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Finally, we acknowledge the great number of authors and experts not directly referenced in this report but whose study of, and connection to, Te Ao Māori has shaped the way in which the authors of this current report have approached the subject.

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Appendix 1 – Hui Attendees

Wellington **15 April 2016**

	Name	Affiliation
1	Amanda Black	Lincoln University
3	Catherine Knight	Ministry for the Environment
4	Cathy Schuster	Weaver
5	Che Wilson	Ministry for the Environment
6	Chris Hepburn	University of Otago
7	Clive Stone	Ngāti Wai
9	Edna Pahewa	Te Puia
10	Fiona Hodge	Ministry for the Environment
11	Garth Harmsworth	Landcare Research
12	Guy Penny	Ngāti Kahungunu
14	James Hudson	IMSB
15	Jim Doherty	Tūhoe Tuawhenua Trust
16	Jim Schuster	Heritage NZ
17	Joe Harawira	Department of Conservation
18	John Forne	Statistics New Zealand
19	John Procter	Massey University
20	John Turi	Weaver
23	Mahuru Robb	Landcare Research
24	Manu Graham	Ministry for the Environment
25	Melanie Mark-Shadbolt	Lincoln University
26	Mereana Wilson	Ministry for the Environment
27	Morry Black	Ngāti Kahungunu
28	Naomi Simmonds	University of Waikato
29	Ngaire Raikabula	Landcare Research
30	Phil Lyver	Landcare Research
31	Puke Timoti	Tūhoe Tuawhenua Trust
33	Shaun Awatere	Landcare Research
34	Sue Scheele	Landcare Research
36	Tina Wirihana	Te Roopū Raranga Whatu
37	Tipene (Steven) Wilson	Consultant

38	Tui Shortland	Consultant
39	Waitangi Wood	Tau Iho I Te Po Trust
40	Yvonne Taura	Landcare Research
42	Cheri van Schravendijk-Goodman	Consultant
43	Johnnie Freeland	Auckland Council
44	Dianne Brown	Te Ohu Kaimoana
45	Rereata Makiha	Auckland Council
46	David Harris	Statistics New Zealand

Rotorua 13 May 2016

	Name	Affiliation
1	Amanda Black	Lincoln University
2	Anthony Cole	Bay of Plenty Regional Council
3	Caine Tiatia	Bay of Plenty Regional Council
4	Cathy Schuster	Weaver
5	Fiona Hodge	Ministry for the Environment
6	Garth Harmsworth	Landcare Research
7	Jim Doherty	Tūhoe Tuawhenua Trust
8	Jim Schuster	Heritage NZ
9	John Forne	Statistics New Zealand
10	Kelly Palmer	Ministry for the Environment
11	Kelly Ratana	NIWA
12	Lisa Te Heuheu	Ngāti Hine
13	Mahuru Robb	Landcare Research
14	Manu Graham	Ministry for the Environment
15	Matemoana McDonald	Bay of Plenty Regional Council
16	Melanie Mark-Shadbolt	Lincoln University
17	Mereana Wilson	Ministry for the Environment
18	Morry Black	Ngāti Kahungunu
19	Phil Lyver	Landcare Research
20	Puke Timoti	Tūhoe Tuawhenua Trust
21	Roku Mihinui	Te Arawa
22	Shaun Awatere	Landcare Research
23	Sue Scheele	Landcare Research
24	Tina Wirihana	Te Roopu Raranga Whatu
25	Tipene (Steven) Wilson	Consultant
26	Waitangi Wood	Tau Iho I Te Po Trust
27	Yvonne Taura	Landcare Research
28	Cheri van Schravendijk-Goodman	Consultant
29	Johnnie Freeland	Auckland Council
30	Rereata Makiha	Auckland Council
31	Fiona Carswell	Landcare Research

Appendix 2 – Themes from hui one grouped according to Lyver et al. (2016) categories

No.	Te Ao Māori concept	Te Reo Pākehā Definition	Theme ('Red dot' priorities)
1	Hua o te whenua / wai/ moana	Natural productivity of the land / freshwater / ocean	Skinny Tūhoe coming out of the bush
			Ecosystem and impacts
			Abundance and quality
			Timing
			Fruiting and flowering out of season (1)
			Forest looking like a bride (2)
			Abundance of taonga species (manu, ika, rongoā, kai moana) (50)
			Composition of environmental resources
			Availability and accessibility of resource
			Physical well-being of resource
			Loss of biodiversity to sustain kai and shelter
2	Mātauranga / Māramatanga	Knowledge / Wisdom	Mastery of practice
			Number of wānanga institutions
			Research and documentation
			Rejuvenation of lost knowledge
			Access to Crown/LGA/CRI information and databases
			Kōrero tuku iho
			Tūpuna knowledge
			Tohunga – number, related hui, outcomes
			Access to mātauranga
			Retention of cultural knowledge (52)
3	Tino rangatiratanga / Mana motuhake	Absolute governance / political agency	Taonga held overseas
			Mana to decide and self-authorise (authority) (14)
			Working with government departments
			Co-governance (RMA S.33) and joint management agreement
			Aggressive land management by Pākehā (who don't consult with Māori)
			Te Tiriti of Waitangi settlements
			Sovereignty – positioning (land not ceded)

No.	Te Ao Māori concept	Te Reo Pākehā Definition	Theme ('Red dot' priorities)
			Policy engagement – full and effective participation
			Land tenure (DOC, councils)
			Impact on ture – law/lore
			Inequitable resourcing
			Under resourcing – over-expectation (20)
4	Maramataka	Māori lunar calendar or annual timetable	Maramataka
			Activities as measured by the maramataka
			Māra kai – whānau, marae, hapori
			Ngā whetū mārama
			Wai – whetū
5	Mana whenua	Mana over the landscape / People of the land)	Loss of sites and resource (22)
			Access to cultural resources (6)
			Mauri, mana, wairua, tapu, manaaki
6	Āhua o te ngahere	Nature of character of the forest	Te tai ata te tai pō (Is the dawn chorus present?) (14)
			No bird song in bush
			Kanikani o te ngahere (natural rhythms of the forest)
			Night sounds have changed – possums (paihamu) / frogs (poraka) (3)
			Change in karanga – mooing Waikato
			Sound of the ngahere (7)
			Te reo o te ngahere
			Te reo o te taiao
7	Whānaungatanga	Collective responsibility / Inter-relationships	Whiria – weave together
			Whānaungatanga – relationships (23)
			Iwi relationships
			Connectedness
			Working too much for aroha (need balance)
8	Te whakaora reo	The living state of the Māori language	Kapa haka – number of groups, quality measured, contribution to wider whānau/hapori, Māori outcomes
			Ngā korero, ngā reo (13)
			Reo – kitea, rongohia, ākona, kōrerohia (2)
			Reo pertaining to toi raranga

No.	Te Ao Māori concept	Te Reo Pākehā Definition	Theme ('Red dot' priorities)
			Linguistic diversity
			Use of local names – protection of those names (4)
9	Mahinga kai	Food procurement	Plentiful abundance for harvest (harvest of kererū, flock size of kererū) (17)
			Composition of kai kete
			Access to mahinga kai
			Cultural harvest
10	Ahi kā roa	Connection to land and place	Tūrangawaewae: whānau – tūpuna – mokopuna – whenua
			Māori architecture in city scapes (12)
			Urban design (3)
11	Whakapapa	Genealogy	Cultural diversity
			Connection to atua – Tāwhirimātea, Tangaroa, Tāne
			Atua – whakapapa continuity. Tipua–Kaihaki; Tūpuna–Tāngata (9)
12	Oranga	Personal well-being	Hauora / rongoā identity
			Relationships between people and environment (Hauora) (7)
13	Rauemi Māori	Natural resources that becomes a product (raranga, rongoā, whakairo, tāmoko)	Rongoā plants (7)
			Quality and quantity of resources
			Resources suitable for purpose
			Range of resource materials
14	Mauri taiao	Life essence of the environment	Conservation status
			Mauri – resilience and adaptation (5)
			Biodiversity – relative to the whenua and people
			Species capability
			Contaminants with respect to mauri, wairua and mana
			Endangered species, ecosystems and knowledge
			Ecosystem function
15	Taha wairua	Spiritual dimension	Spiritual/wairua connections
			Karakia – lack of karakia used in today's traditional and contemporary practice (3)
			Impact loss of sustainability of the mauri. Not just science
16	Kaitiakitanga	Guardianship, stewardship and	Conservation and preservation

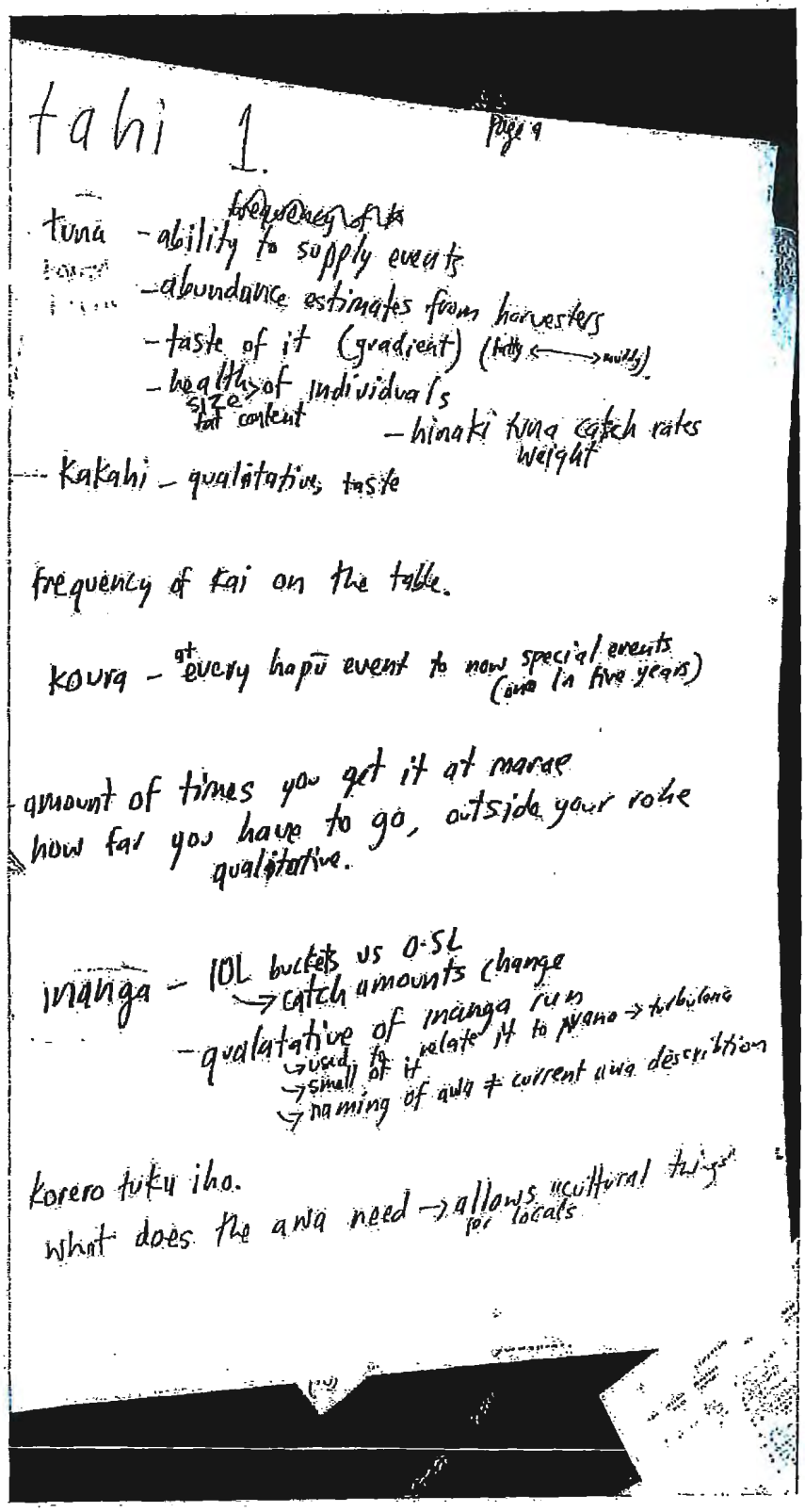
No.	Te Ao Māori concept	Te Reo Pākehā Definition	Theme ('Red dot' priorities)
		co-management	practice
			Te Roopū Raranga Whatu o Aotearoa members
			Acknowledgement of Kāhui Whiri Toi
			Traditional practices
			Traditional occupations
			Traditional practices
			Kai harvesting sites
			Harvesting techniques
			Practices surrounding harvest – impacts on practice and knowledge
			Water security – puna, karakia, whakapapa practices
			Kaitiakitanga – ability to practice true kaitiakitanga (2)
17	Taha kikokiko	Physical health	Hākinakina – whānau level, hapū level, marae/hapū level, rohe level
18	Taha whānau	Social wellbeing	Whānau – tautiko
			Community interactions
19	Āhua o te whenua	Nature or character of the land	Ngā momo tai (Ki Uta Ki Tai) – land and whenua interface
			Effects on ecosystems, tides, temperature (melt), erosion, & nutrient loading
			Weed or feed
			Te reo o te whenua
			Ngā mea katoa – impacts from degradation of ecosystems
			Abundance of species (pests vs native)
20	Te Ōhanga whai rawa	Economic development	Te Ao Ōhanga – economic return or gain
21	Tikanga	Customs and protocols	Taonga tuku iho – mōteatea, waiata, whakapapa
			Ceremonies
22	Āhua o te wai	Nature of water	Te reo o te wai
23	Āhua o te taiao	Nature of the environment	Impact of climate
			Distribution (spatial and temporally)
			Local risk to species
			Ngā momo tohu
24	Whāngai mokopuna	Guidance by elders. The practice of an elder nurturing or	Tamariki engaged in the environment

No.	Te Ao Māori concept	Te Reo Pākehā Definition	Theme ('Red dot' priorities)
		Instructing a child or youth.	Rangatahi – rangatahi groups – number of groups, activities/priorities, nature of connections
			Local interactions with whenua and wai
			Disconnect – how to reconnect minds and hearts
			Succession planning (passing knowledge on)
			Inter-generational knowledge – showing and telling
			Story telling

Appendix 3 – Measures from tables during hui 2

Table 1: From themes to measures

Te Ao Māori concept	Te Reo Pākehā Definition	• Theme
Mātauranga / Māramatanga	Knowledge / Wisdom	• Mastery of practice • Number of wānanga institutions • Research and documentation • Rejuvenation of lost knowledge • Access to Crown/LGA/CRI information and databases • Kōrero tuku iho • Tūpuna knowledge • Tohunga – number, related hui, outcomes • Access to mātauranga • Retention of cultural knowledge
Mahinga kai	Food procurement	• Plentiful abundance for harvest (harvest of kererū, flock size of kererū) • Composition of kai kete • Access to mahinga kai • Cultural harvest
Oranga	Personal well-being	• Oranga • Hauora / rongoā identity • Relationships between people and environment (Hauora)
Āhua o te whenua	Nature or character of the land	• Ngā momo tai (Ki Uta Ki Tai) – land and whenua interface • Effects on ecosystems, tides, temperature (melt), erosion, & nutrient loading • Weed or feed • Te reo o te whenua • Ngā mea katoa – impacts from degradation of ecosystems • Abundance of species (pests vs native)
Āhua o te wai	Nature of water	• Te reo o te wai



tahi 1. page 9

tuna - ability to supply events (frequency of it)
- abundance estimates from harvesters
- taste of it (gradient) (fatty ⟷ mushy)
- health of individuals (size, fat content)
- hinaki tuna catch rates (weight)

kakahi - qualitative, taste

frequency of kai on the table.

kōura - at every hapū event to now special events (once in five years)

amount of times you get it at marae
how far you have to go, outside your rohe
qualitative.

mānga - 10L buckets vs 0.5L → catch amounts change
- qualitative of manga run
→ used to relate it to awa → turbulence
→ small of it
→ naming of awa ≠ current awa description

korero tuku iho.
what does the awa need → allows "cultural things" for locals

Page 2

common to all concepts – whakapapa connections

how fragmented are your forests – whakapapa between ngāhere & awa from other ecosystems

barriers to whakapapa – access
– urban drift
– fragmentation
– wananga

are kaitiaki able to access / manage their role / resources? say?

intergenerational transfer of mātauranga – & census data
– survey who is practising

demographics of marae paepae
marae AGM / wananga
is the quorum?

te ao māori – state of the env. includes people

maramataka.

mahinga kai – can you get there?
– state of kai?
– ecosystem health

springs – number
– flow

– biodiversity at springs
area / desirable species

health of underground aquifers – connections of grounds
characteristics of water & fish.
e.g. taniwha springs

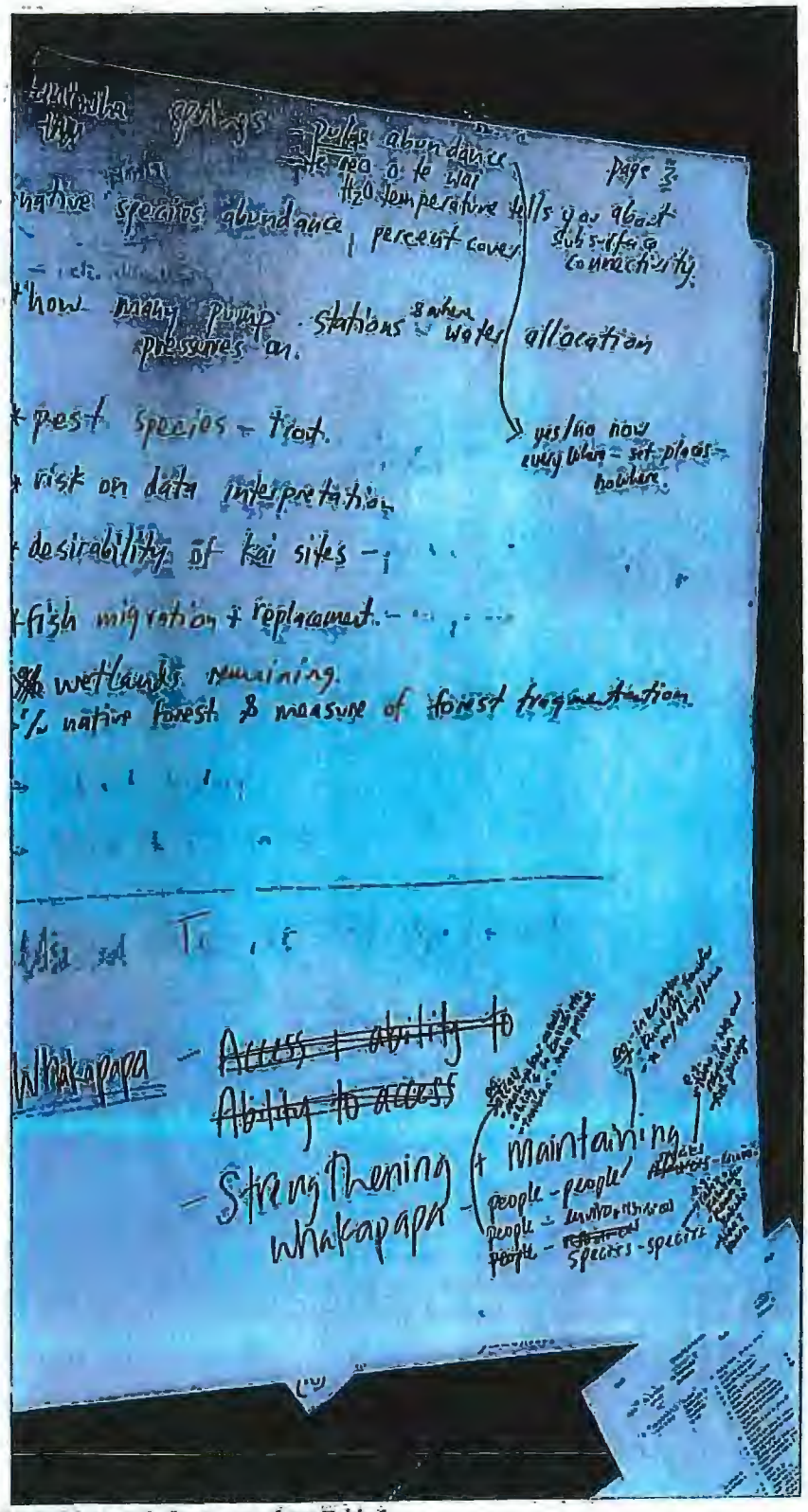


Figure 1: Photographic record of measures from Table 1

Table 2: From themes to measures

Te Ao Māori concept	Te Reo Pākehā definition	Theme
Hua o te whenua / wai/ moana	Natural productivity of the land / freshwater / ocean	• Skinny Tūhoe coming out of the bush • Ecosystem and impacts • Abundance and quality • Timing • Fruiting and flowering out of season • Forest looking like a bride • Abundance of taonga species (manu, ika, rongoā, kai moana) • Composition of environmental resources • Availability and accessibility of resource • Physical well-being of resource • Loss of biodiversity to sustain kai and shelter
Ahi kā roa	Connection to land and place	• Tūrangawaewae: whānau – tūpuna – mokopuna – whenua • Māori architecture in cityscapes Urban design
Whakapapa	Genealogy	• Cultural diversity • Connection to atua – Tāwhirimātea, Tangaroa, Tāne • Atua – whakapapa continuity: Tīpua– Kaihaki; Tūpuna-Tāngata
Te ōhanga whai rawa	Economic development	• Te Ao Ōhanga – economic return or gain
Tikanga	Customs and protocols	• Taonga tuku iho – mōteatea, waiata, whakapapa • Ceremonies

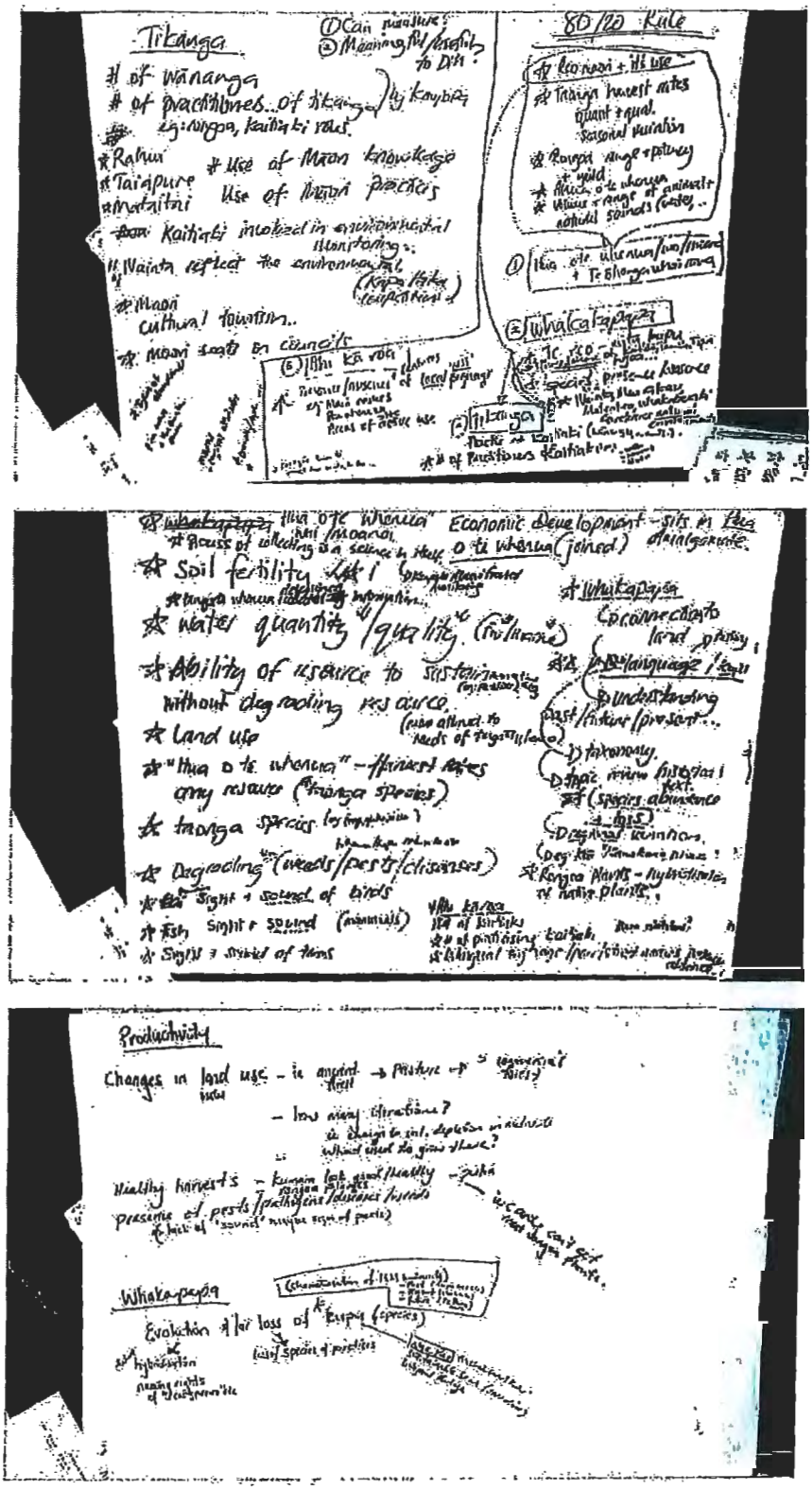
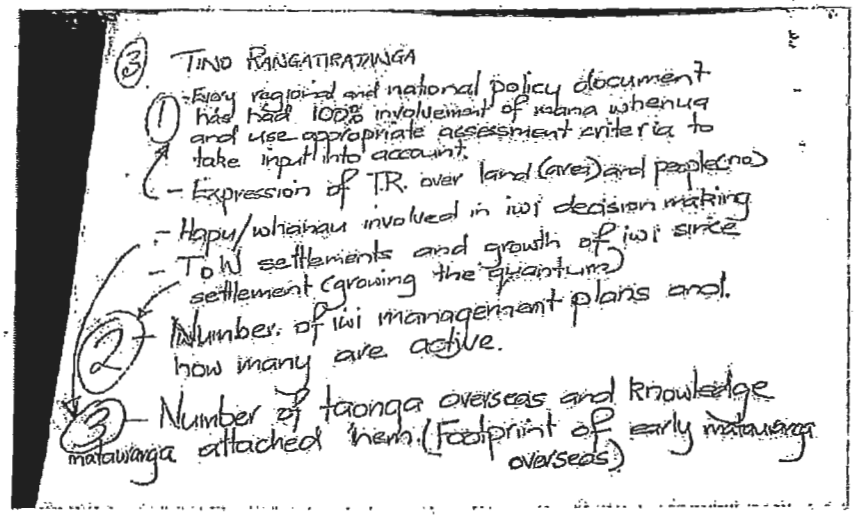


Figure 2: Photographic record of measures from Table 2

Table 3: From themes to measures

Te Ao Māori concept	Te Reo Pākehā Definition	• Theme
Tino rangatiratanga / Mana motuhake	Absolute governance / political agency	• Taonga held overseas • Te Ture – Whaimana o te awa o Waikato (Vision and Strategy) • Mana to decide and self-authorise (authority) • Working with government departments • Co-governance (RMA S.33) and joint management agreement • Aggressive land management by Pākehā (who don't consult with Māori) • Te Tiriti of Waitangi settlements • Sovereignty – positioning (land not ceded) • Policy engagement – full and effective participation • Land tenure (DOC, councils) • Impact on ture – law/lore • Inequitable resourcing • Under resourcing – over-expectation
Te whakaora reo	The living state of the Māori language	• Kapa haka – number of groups, quality measured, contribution to wider whānau/hapori, Māori outcomes • Ngā korero, ngā reo • Reo – kitea, rongohuia, ākona, kōrerohia • Reo pertaining to toi raranga • Linguistic diversity • Use of local names – protection of those names
Rauemi Māori	Natural resources that becomes a product (raranga, rongoā, whakairo, tāmoko)	• Rongoā plants • Quality and quantity of resources • Resources suitable for purpose • Range of resource materials
Taha whānau	Social wellbeing	• Whānau – tautiko • Community interactions
Āhua o te taiao	Nature of the environment	• Impact of climate • Distribution (spatial and temporally) • Local risk to species • Ngā momo tohu



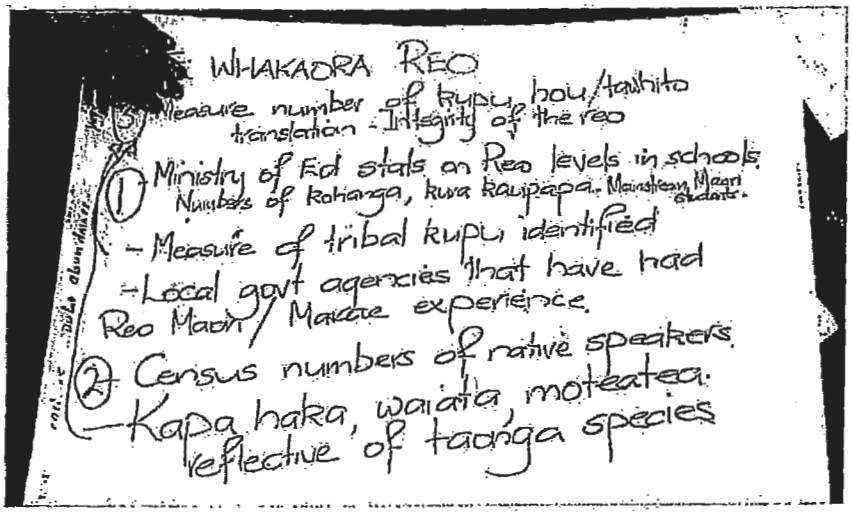


Figure 3: Photographic record of measures from Table 3

Table 4. From themes to measures

Te Ao Māori concept	Te Reo Pākehā Definition	Theme
Mana whenua	Mana over the landscape / People of the land)	• Loss of sites and resource • Access to cultural resources • Mauri, mana, wairua, tapu, manaaki
Āhua o te ngahere	Nature of character of the forest	• Te tai ata te tai pō (Is the dawn chorus present?) • No bird song in bush • Kanikani o te ngahere (natural rhythms of the forest) • Night sounds have changed – possums (paihamu) / frogs (poraka) • Change in karanga - mooing Waikato • Sound of the ngahere • Te reo o te ngahere • Te reo o te taiao
Taha wairua	Spiritual dimension	• Spiritual/wairua connections • Karakia – lack of karakia used in today's traditional and contemporary practice Impact loss of sustainability of the mauri. Not just science
Kaitiakitanga	Guardianship, stewardship and co-management	• Conservation and preservation practice • Te Roopū Raranga Whatu o Aotearoa members • Acknowledgement of Kāhui Whiri Toi • Traditional practices • Traditional occupations • Traditional practices • Kai harvesting sites • Harvesting techniques • Practices surrounding harvest – impacts on practice and knowledge • Water security – puna, karakia, whakapapa practices • Kaitiakitanga – ability to practice true kaitiakitanga

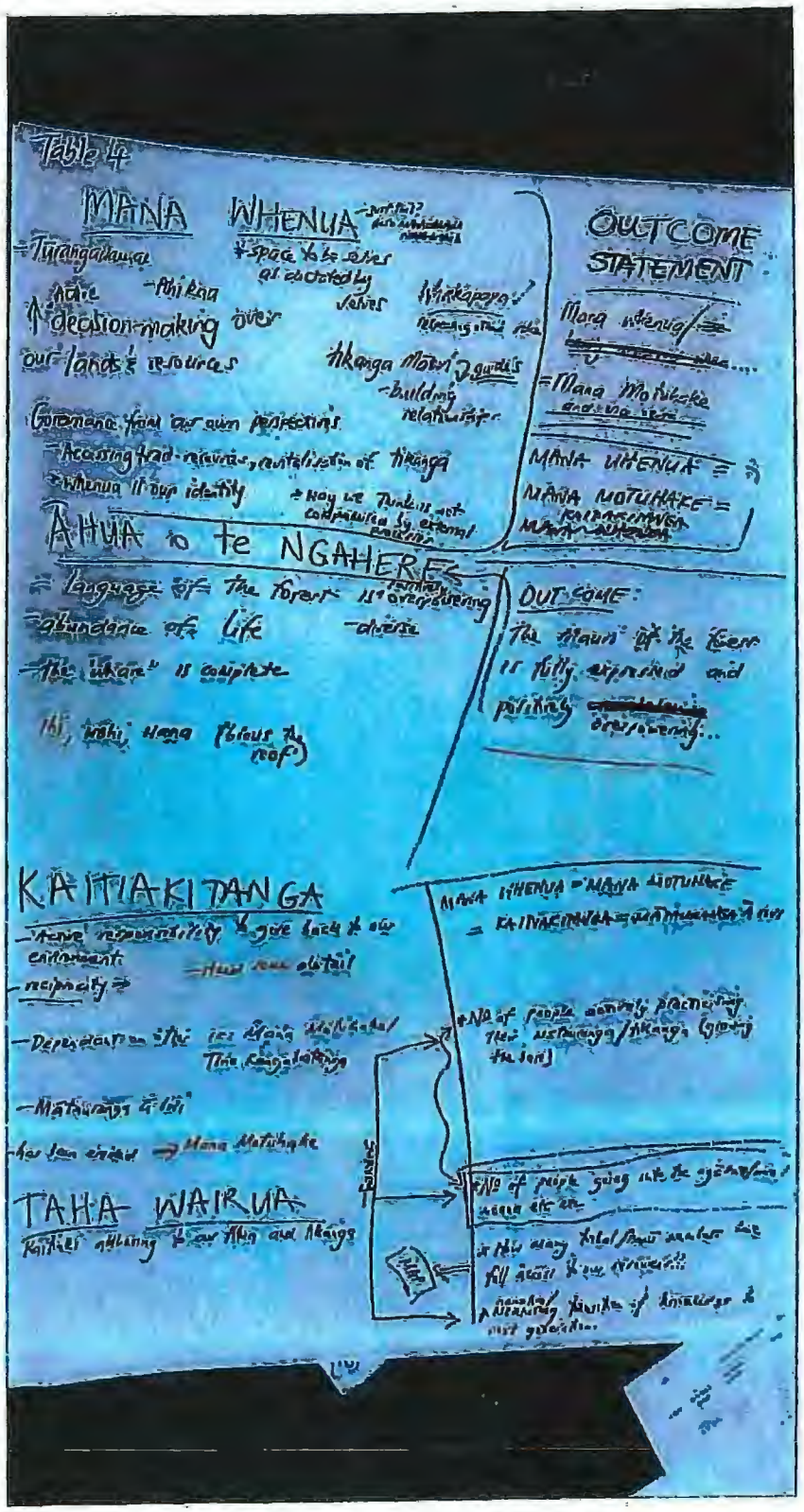


Table 4
MANA WHENUA
OUTCOME STATEMENT
AHUA to te NGAHERE
KAITIAKITANGA
TAHA WAIRUA

Figure 4. Photographic record of measures from Table 4

Table 5: From themes to measures

Te Ao Māori concept	Te Reo Pākehā Definition	• Theme
Maramataka	Māori lunar calendar or annual timetable	• Maramataka • Activities as measured by the maramataka • Māra kai – whānau, marae, hapori • Ngā whetū mārama • Wai – whetū
Whānaungatanga	Collective responsibility / inter-relationships	• Whiria – weave together • Whānaungatanga – relationships • Iwi relationships • Connectedness • Working too much for aroha (need balance)
Mauri taiao	Life essence of the environment	• Conservation status • Mauri – resilience and adaptation • Biodiversity – relative to the whenua and people • Species capability • Contaminants with respect to mauri, wairua and mana • Endangered species, ecosystems and knowledge • Ecosystem function
Taha kikokiko	Physical health	• Hākinakina – whānau level, hapū level, marae/hapū level, rohe level
Whāngai mokopuna	Guidance by elders. The practice of an elder nurturing or instructing a child or youth	• Tamariki engaged in the environment • Rangatahi – rangatahi groups – number of groups, activities/priorities, nature of connections • Local interactions with whenua and wai • Disconnect – how to reconnect minds and hearts • Succession planning (passing knowledge on) • Inter-generational knowledge – showing and telling • Story telling

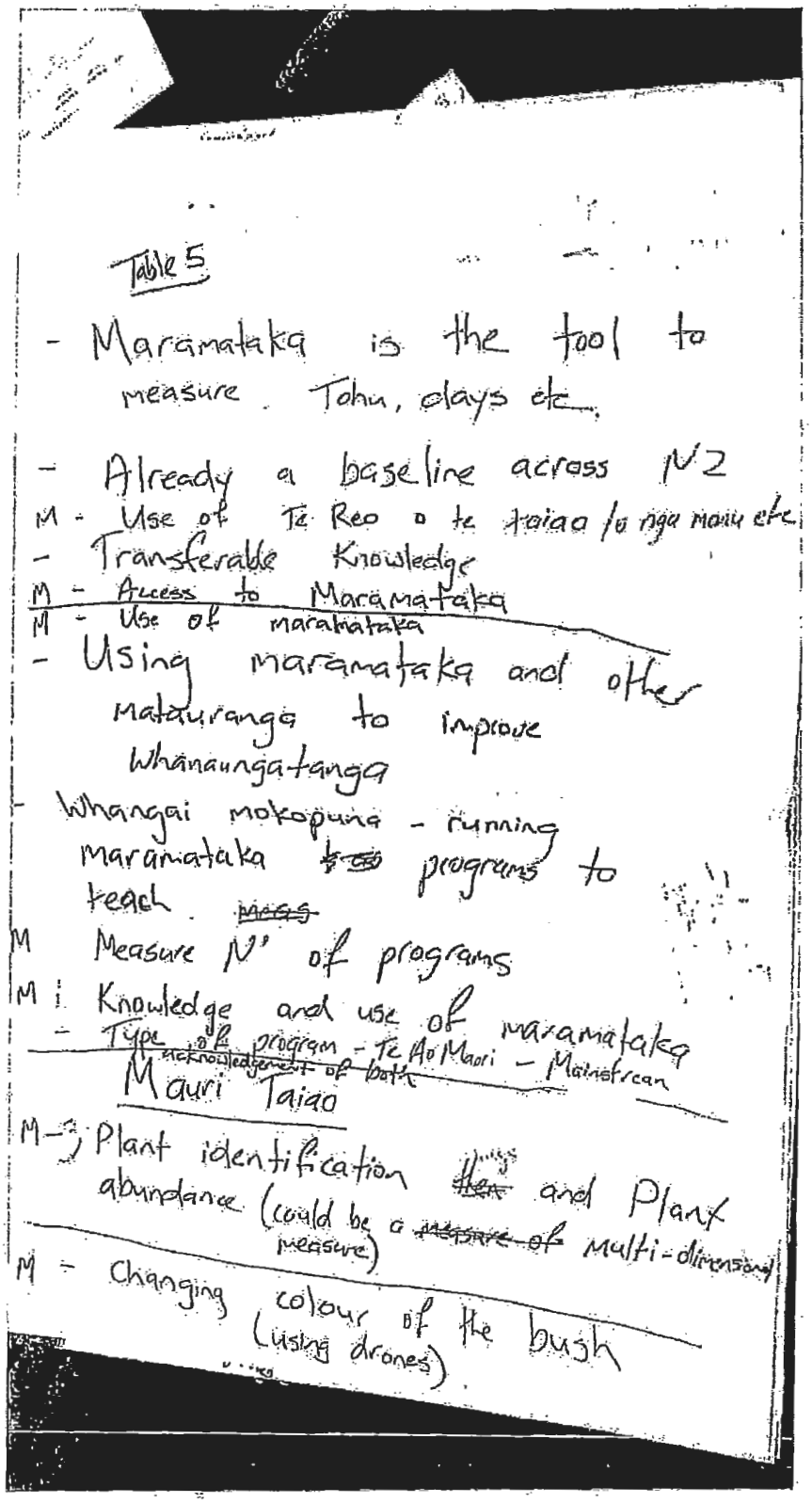


Table 5

- Maramataka is the tool to measure Tohu, clays etc.
- Already a baseline across N2
M - Use of Te Reo o te taiao /o nga mahi etc
- Transferable Knowledge
M - Access to Maramataka
M - Use of maramataka
- Using maramataka and other Matauranga to improve Whanaungatanga
- Whangai mokopuna - running Maramataka ~~to~~ programs to teach ~~mass~~
M Measure N° of programs
M : Knowledge and use of maramataka
- Type of program - Te Ao Maori - Mainstream ~~acknowledgement of both~~
Mauri Taiao
M - Plant identification ~~the~~ and Plant abundance (could be a ~~measure of~~ multi-dimensional measure)
M - Changing colour of the bush (using drones)

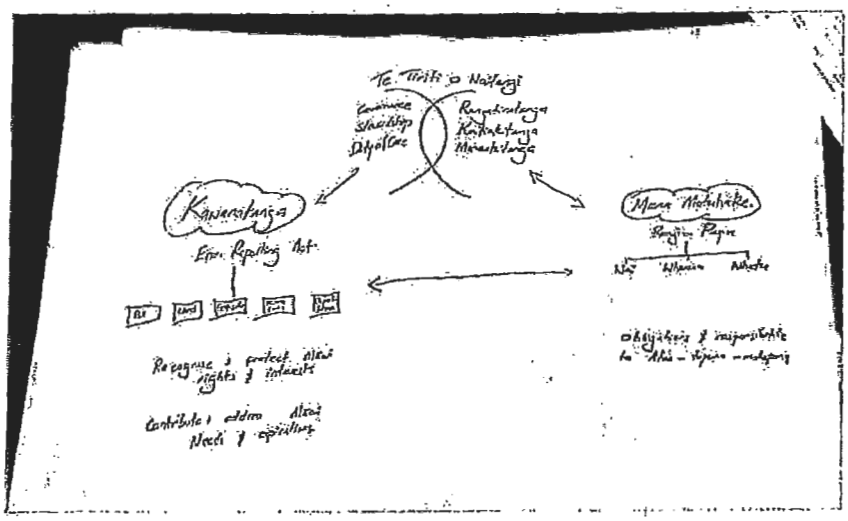


Figure 5. Photographic record of measures from Table 5

Appendix 4 – Consolidated themes and measures from both hui aligned to mana motuhake principles.

Mana Whakahaere	Tūrangawaewae	Whānaungatanga	Taonga Tuku Iho	Te Ao Tūroa
Outcome: Mana Whenua are effectively participating in natural resource management	*Outcome: Whānau, hapū and iwi identity is reflected in the natural and built landscape*	*Outcome: Whānau, hapū and iwi well-being is improved through their connection to the natural environment*	*Outcome: Whānau, hapū and iwi are actively utilising kaitiakitanga based practices and these practices are being transferred inter-generationally*	*Outcome: Whānau, hapū and iwi are sustainably harvesting taonga tuku iho for physical and spiritual sustenance*
Mana Whenua = Mana Motuhake and vice versa	Māori identity is recognised in urban design and infrastructure	Oranga	Kaitiaki present for each marae	Hua o te wai
Co-governance agreement	Māori identity is recognised in conservation reserves	Rongoā plants are readily accessible	No. of Kaitiaki per marae	Abundance of taonga species present (manu, ika, rongoā, kai moana)
Effectiveness of co-management agreement	Number of information bulletins with mana whenua presence	Number of Māori attendees at planting or restoration activities	Kaitiaki are effective	Ngā Ika
Customary reserve formally recognised	Adequate and accurate pou whenua are present	Number of Māori accessing walking tracks	Number of hui/ wānanga	Kaeo
Access through private property	Bilingual signage at conservation reserves	Number of whānau, hapū and iwi based wānanga	Tikanga practised and maintained	Inanga
Access through DOC/council reserves	How fragmented are the forests? Whakapapa between ngahere and awa	Number of collaborative community initiatives involving whānau, hapū and iwi	Tribal knowledge databases	Kōura
Policy engagement – full and effective participation of tāngata whenua	Local place-names in te reo	Number of hākinakina (sports) events involving whānau, hapū and iwi	Ceremonies and rituals are performed	Tuna
Number of iwi environmental management plans	Changes in land use over time – forest to pasture	Barriers to whakapapa- access, urban drift	Number of tohunga	Ngā Manu
How many active	Cultural tourism – impact on environment	Is connectedness between people and people, people and environment, being maintained	Rahui are formally recognised	Spawning
Number of taonga repatriated	The mauri of the forest is fully experienced and positively	Are soil fertility, water quality	Number of Rahui formally notified	Inanga spawning at right time
Adequate resourcing of mana whenua			Maramataka are utilised by Tangata Kaitiaki	Tuna puhi at the right time
Sites are identified by iwi/hapū			Number of hui/wānanga	Kai are safe to eat/harvest
			Number of people who have knowledge	Pollution in water
			Number of people who are	*E.coli*
				Pollution in kai
				Heavy metal

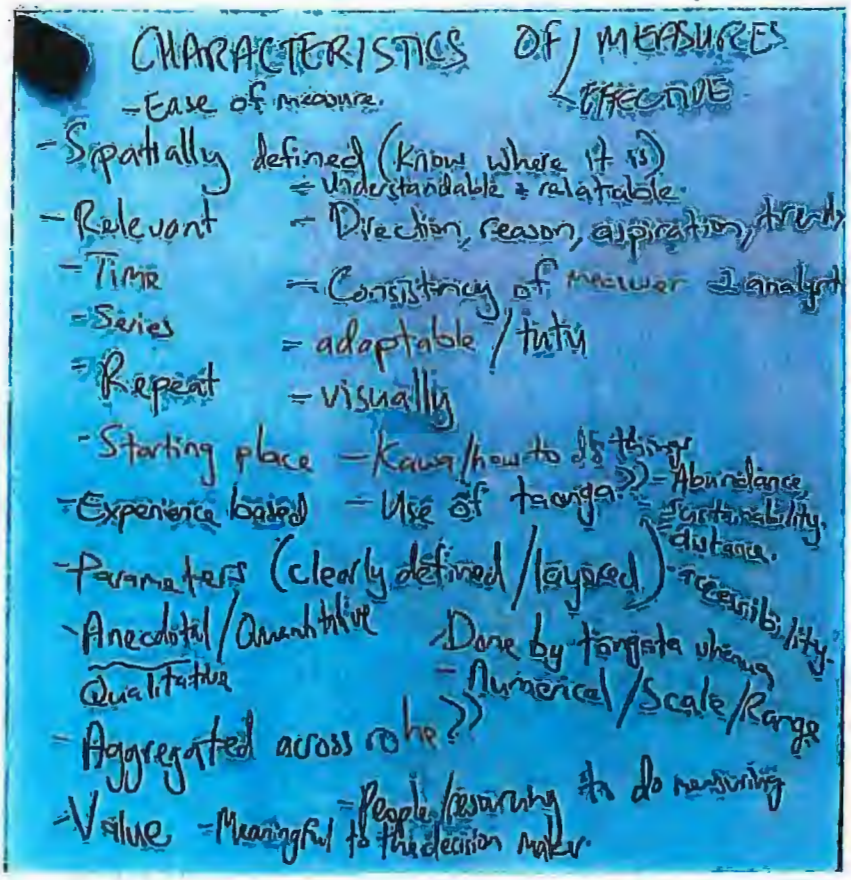
Mana Whakahaere	Tūrangawaewae	Whānaungatanga	Taonga Tuku Iho	Te Ao Tūroa
Formal recognition and protection of sites – Wāhi Tapu, Wāhi taonga, Mahinga kai sites, taiapure, mātaitai	overwhelming	(freshwater, marine) being maintained.	users	Toxins
Kaitiaki involved in environmental monitoring		Make whenua more fertile	Access to Crown/LGA/CRI information and databases	Kai tastes good
Local government agencies have reo Māori/marae experience		Au Pūtea	Sustainable harvesting techniques are utilised	Catch per unit effort
		Sustainable harvest/use	Te Whakaora Reo	How many inanga to fill bucket 10 l vs 0.5 l
		Local employment opportunities	Number of waiata and mōteatea with taiao kaupapa	Health of species- fat content, disease, worms in flesh
		No of Full Time Equivalents	Reo pertaining to toi raranga maintained	Distance to collect food
		Local training opportunities	Reo pertaining to toi mahinga kai maintained	Sound of wai
		No of Full Time Equivalents	Hapū and iwi reo diversity enhanced and maintained	Hua o te whenua
		Local investment	Census of native speakers	Taonga species present
		Whāngai Mokopuna	Min. Educ. statistics on te reo levels in schools	Ngā Manu
		Number of tamariki engaged in the environment		Harvest of taonga species
		Number of rangatahi groups		Flock size
		Number of wānanga with rangatahi		Quality of taonga species
		Inter-generational knowledge is transferred		Rongoā – potency and yield
				Composition of kai kete
				Productivity of māra kai
				Māra kai produce utilised for hui
				How often traditional kai on table
				Sight and sound of birds, mammals, trees

Mana Whakahaere	Tūrangawaewae	Whānaungatanga	Taonga Tuku Iho	Te Ao Tūroa
				Āhua o te wai
				Te Reo o te wai
				Water appearance
				Clear after rain
				Is it swimmable?
				Is it potable?
				Habitat
				Slow current
				Good vegetation cover along the bank
				Shape of stream includes pools and runs
				Water moves
				Tī kouka used for ariari board to see īnanga
				Flow
				Enough for tuna heke
				Enough for īnanga spawning
				Enough for kauanga kai activities
				Health of aquifer
				No and area of springs, flow, connection of freshwater bodies
				How many pump stations,

Mana Whakahaere	Tūrangawaewae	Whānaungatanga	Taonga Tuku Iho	Te Ao Tūroa
				where?
				Āhua o te Ngāhere
				Te reo o te Ngāhere
				Te tai ata te tai pō (Is the dawn chorus present?)
				Bird song is present
				Kanikani o te ngahere (natural rhythms of the forest)
				Show changing colour of bush, using drones
				Ability to identify plants
				Āhua o te Whenua
				Effects on ecosystems, tides, temperature (melt), erosion, & nutrient loading
				Weed or feed
				Pest species – (trout?)/pathogens/ diseases/weeds
				Ngā mea katoa – impacts from degradation of ecosystems
				Impact of climate
				Skinny Tūhoe coming out of the bush
				Ecosystem and impacts
				Abundance and quality

Mana Whakahaere	Tūrangawaewae	Whānaungatanga	Taonga Tuku Iho	Te Ao Tūroa
				Fruiting and flowering out of season
				Forest looking like a bride
				Taha Wairua
				Mauri Taiao– resilience and adaptation
				Cultural Health Index
				Mauri Assessment
				Whakapapa – connectivity
				Presence of Tipua\Taniwha
				Presence of Kaitiaki
				Other Tohu

Appendix 5 – Characteristics of effective measures as supplied by hui participants



INDIGENOUS MĀORI KNOWLEDGE AND PERSPECTIVES OF ECOSYSTEMS

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ABSTRACT: A framework/model based on Māori knowledge, values and perspectives is presented that distinguishes 'cultural values' from 'cultural services' and extends the definition of cultural values across the whole ecosystem services framework. Māori aspirations and well-being are interdependent on ecosystems and ecosystem services. Ultimately Māori wish to use these ecosystem approaches and frameworks to increase participation and inclusion in decision-making, to achieve multidimensional aspirational goals and desired indigenous outcomes.

INTRODUCTION

'Ka mau tonu nga taonga tapu o nga matua tupuna
Koinei nga taonga i tuku iho, na te ātua'
'Hold fast to the treasures of the ancestors
For they are the treasures that have been handed down to us by God'

Indigenous Māori have an intricate, holistic and interconnected relationship with the natural world and its resources, with a rich knowledge base – mātauranga Māori – developed over thousands of years and dating back to life in Polynesia and trans-Pacific migrations. This ancestral traditional bond links indigenous Māori to ecosystems and governs how they see and understand ecosystems and ecosystem services. There is no single Māori word or translation for ecosystem or ecosystem services, but mātauranga Māori (Māori knowledge), te reo Māori (Māori language) and whakapapa (ancestral lineage) are used together to unlock the indigenous perspective and understand what an ecosystem is, and its components and functional units.

Māori see the declining area and condition of natural ecosystems and the services they provide as significant and challenging. Many factors are involved in the ongoing and ubiquitous destruction and decline of the world's forest, freshwater, wetland, coastal, and marine ecosystems. But with this destruction has come an alarming decline in life forms such as plant, animal, bird, and fish species, a rapid rise in the extinction of many species, and a reduction in the area and quality of habitat required to sustain this range of life forms. For Māori this widespread degradation is manifest through declining areal extent and quality of customary resources, and increasing difficulty in accessing such resources. For Māori, as with other indigenous cultures, there are clear links between healthy ecosystems (with greater life-supporting capacity) and people's cultural and spiritual well-being. There is a realisation that most ecosystems require a diversity of life forms to exist and function properly (DOC & MfE 2000), and to sustain the services provided by ecosystems. This holistic thinking, based on traditional Māori values and beliefs, has increasing parallels with late 20th century emergent concepts and practices of interdisciplinary mainstream science, sustainability, ecological economics, and integrated planning and policy.

These sentiments resound strongly in the following Māori proverbs (whakatauki) and are often used to express indigenous perspectives in Māori planning and policy documents.

E tangi ana nga reanga o uta, e mahara ana nga reanga a taima ta aha ra e whakamahana taku ora kia tina – When the land, river and sea creatures are in distress then I have nothing to be proud of (Ngāti Wai)

He kawenga ki te whenua, ki ngā uri o ngā ātua – The ethic of responsibility towards the natural environment (Ngāti Wai and Ngāti Whatua)

Ko ahau te taiao, ko te taiao, ko ahau – The ecosystem defines my quality of life (Ngāti Wai and Ngāti Whatua)

Whakarongo, whakarongo, whakarongo ki te tangi o te manu e karanga nei; tui, tui, tui, tuia – Listen to the cry of the birds calling for unity – the introductory lines of the karakia remind us that the natural world has a lot to teach mankind about the preservation of unity, interdependence, harmony and balance (Ngāti Paoa iwi environmental management plan).

TRADITIONAL KNOWLEDGE AND BELIEFS

Traditional concepts and knowledge still shape the thinking of most Māori today, and traditional values resonate strongly in contemporary Māori society, forming the basis for indigenous perspectives. The Māori world view acknowledges a natural order to the universe, a balance or equilibrium, and that when part of this system shifts, the entire system is put out of balance. The diversity of life is embellished in this world view through the interrelationship of all living things as dependent on each other, and Māori seek to understand the total system and not just parts of it.

Māori beliefs, custom, and values are derived from a mixture of cosmogony, cosmology, mythology, religion, and anthropology (Best 1924a, b; Buck 1950; Marsden 1988; Barlow 1993; Henare 2001; Mead 2003). Integral to this complex and evolutionary belief system are the stories of the origins of the universe and of Māori people; the sources of knowledge and wisdom that have fashioned the concepts and relationship Māori have with the environment today (Marsden 1988; Henare 2001). From a Māori perspective, the origin of the universe and the world can be traced through a series of ordered genealogical webs that go back hundreds of generations to the beginning (Figure 1). This genealogical sequence, referred to as whakapapa, places Māori in an environmental context with all other flora and fauna and natural resources as part of a hierarchical genetic assemblage with identifiable and established bonds. The whakapapa (Roberts et al. 2004; Hudson et al. 2007) follows a sequence beginning with the nothingness, the void, the darkness, to a supreme god (Io-matua-kore), then emerging light, through to the creation of the tangible world, the creation of two primeval parents (Ranginui and Papa-tū-ā-nuku), the birth of their children (the wind, the forest and plants, the sea, the rivers, the animals), through to the creation of mankind. The two primeval parents, once inseparable, had many children, often termed departmental atua or Māori gods (Figure 2 – about 100 departmental gods), each with supernatural powers.

274 Harmsworth GR, Awatere S 2013. Indigenous Māori knowledge and perspectives of ecosystems. *In* Dymond JR ed. Ecosystem services in New Zealand – conditions and trends. Manaaki Whenua Press, Lincoln, New Zealand.

FIGURE 1 Te Tūmatanga – Māori creationist theory from the beginning

In a plan carried out by the children to create light and flourish, the parents were prised apart. The separation of the parents led to Ranginui (the Sky father) forming the sky, resulting in the rain as he continued to weep for his separated wife Papa-tū-ā-nuku (the Earth mother), and Papa-tū-ā-nuku forming the land to provide sustained nourishment for all her children. As part of this ancestry, a large number of responsibilities and obligations were conferred on Māori to sustain and maintain the well-being of people, communities, and natural resources.

It is within this context of cosmology and knowledge that Māori can form a perspective of ecosystems and ecosystem services and make sense of existing and emerging non-Māori scientific and ecological terms, concepts and knowledge forms. Māori language and oral tradition are imperative in unlocking this understanding (Wehi et al. 2009). From a Māori perspective, therefore, an understanding of ecosystems starts with Māori language translation and whakapapa.

MĀTAURANGA MĀORI

Mātauranga Māori (Barlow 1993; Durie 1998; Harmsworth 1998; Harmsworth et al. 2002; Mead 2003; Waitangi Tribunal 2011) provides the basis for the Māori world view and is a perspective encompassing all aspects of knowledge – e.g. philosophy, beliefs, language, methods, technology and practice. There are numerous definitions of mātauranga Māori. One of the more generally accepted is Marsden's (1988), which defines it, in a traditional context, as "the knowledge, comprehension or understanding of everything visible or invisible that exists across the universe"; this includes all Māori knowledge systems or ways of knowing and doing. It can also be simply defined as wisdom. In moving beyond the strictly traditional (i.e. locked in the past), mātauranga Māori has grown into many contemporary forms (e.g. historical, local and regional indigenous knowledge (e.g. Ulluwishewa et al. 2008), Māori perspectives, new innovative approaches) that are complementary to Western scientific knowledge; a view consistent with many recent Māori authors who regard Māori knowledge as a dynamic and evolving knowledge form that represents more than the past (Harmsworth 1997; Durie 1998; Harmsworth et al. 2002, 2011; Morgan 2003, 2006b, 2007; Awatere et al. 2011).

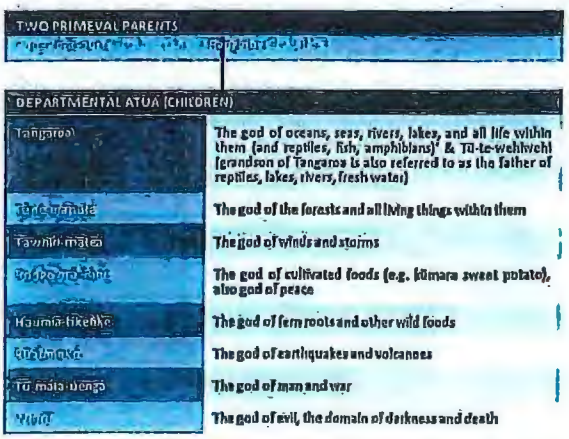

FIGURE 2 The main ātua or departmental gods of Māori, children of Papa-tū-ā-nuku and Ranginui

MĀORI VALUES

Māori values (Henare 1988, 2001; Marsden 1988; Marsden and Henare 1992; Barlow 1993; Harmsworth 1997; Mead 2003) are derived from the traditional belief system based on mātauranga Māori. Values can be defined as instruments through which Māori make sense of, experience, and interpret their environment (Marsden 1988). They form the basis for the Māori world view (te ao Māori), and provide the concepts, principles, and lore Māori use to varying degrees in everyday life, and often to form ethics and principles. This can govern responsibilities and the relationships Māori have with the environment and the way they make decisions. Important Māori values (see glossary) include: tikanga (customary practice, values, protocols); whakapapa (ancestral lineage, genealogical connections, relationships, links to ecosystems); tino rangatiratanga (self-determination); mana whenua (authority over land and resources); whānaungatanga (family connections); kaitiakitanga (environmental guardianship); manaakitanga (acts of giving and caring for); whakakotahitanga (consensus, respect for individual differences and participatory inclusion for decision-making); arohatanga (the notion of care, respect, love, compassion); wairuatanga (a spiritual dimension). Māori values can therefore be translated into, and provide a basis for, what is valued (e.g. a geographic reference or spatio-temporal context of that value), and the information required to establish what is significant and how to prioritise values (i.e. among natural resources, soils, significant cultural sites, significant biodiversity habitats and species, iconic cultural plant and animal species).

KEY MĀORI ENVIRONMENTAL CONCEPTS

The Māori values listed above underlie important Māori environmental concepts (Henare 1988, 2001; Marsden 1988; Barlow 1993; Durie 1994; Kawharu 2000; Harmsworth et al. 2002; Mead 2003; Awatere et al. 2011) and form the basis for Māori perspectives when seeking to assess and understand ecosystems. Some of the key environmental concepts are:

- Whakapapa – connection, lineage, or genealogy between humans and ecosystems and all flora and fauna. Māori seek to understand the total environment or whole system and its connections through whakapapa, not just a part of these systems, and their perspective today is holistic and integrated
- Kaitiakitanga – stewardship or guardianship of the environment; an active rather than passive relationship (Marsden and Henare 1992; Roberts et al. 1995)
- Mana – having authority or control over the management of natural resources
- Ki uta ki tai – a whole-of-landscape approach, understanding and managing interconnected resources and ecosystems from the mountains to the sea (the Māori concept of integrated catchment management)
- Taonga tuku iho – intergenerational protection of highly valued taonga, passed on from one generation to the next, in a caring and respectful manner

- Te Ao Turoa – intergenerational concept of resource sustainability
- Mauri – an internal energy or life force derived from whakapapa, an essential essence or element sustaining all forms of life. Mauri provides life and energy to all living things, and is the binding force that links the physical to the spiritual worlds (e.g. wairua). It denotes a health and spirit, which permeates through all living and non-living things. All plants, animals, water and soil possess mauri. Damage or contamination to the environment is therefore damage to or loss of mauri.
- Ritenga – the area of customs, protocols and laws that regulate actions and behaviour related to the physical environment and people. Ritenga includes concepts such as tapu, rahui, and noa, which were practical rules to sustain the well-being of people, communities and natural resources. Everything was balanced between regulated and de-regulated states, where tapu was sacred, rahui was restricted, and noa was relaxed or unrestricted access
- Wairua, Wairuatanga – the spiritual dimension, a spiritual energy and dimension as a concept for Māori well-being

A MĀORI VIEW OF ECOSYSTEMS

An ecosystem is a dynamic complex of plant, animal and micro-organism communities, and the non-living environment interacting as a functional unit. The conceptual framework for the Millennium Assessment (2005a) assumes that people are integral parts of ecosystems. Māori also see themselves as a part of ecosystems rather than separated from ecosystems. To achieve well-being humans require basic materials, health, good social relations, security, and freedom of choice and action. Many of these basic necessities are provided directly and indirectly by ecosystems. Humans not only depend on ecosystems, they influence them directly through land use and management. The strength of this interdependency between humans and ecosystems may be conceptualised as a reciprocal relationship comprising manaaki whenua (caring for the land) and manaaki tangata (caring for people).

The term 'Te Ao Marama', based on whakapapa, means 'a world of light and opening, and symbolises a rich diversity of life, resources, and biodiversity' and 'richness of life' (Harmsworth 2004). It explains the range of life forms that exist, connected through whakapapa – plants, animals, birds, fish, microorganisms, the genes they contain, and the ecosystems they form. Te Ao Turoa and taonga tuku iho articulate a desired intergenerational equity for natural, treasured resources, passed from one generation to the next in as good a condition or state as has been determined in the previous generation. These terms convey knowledge about existence itself and reiterate the interconnection between human beings and the environment as fundamental for food, shelter, recreation, cultural practice, arts, and human well-being, providing the basis for human survival. They also give meaning to the spiritual and tangible dimensions of life.

The great Māori scholars Sir Apirana Ngata and Te Rangi Hiroa (Buck 1950) both wrote of the tradition of harmonising with the environment; and Rangi Mete-Kingi wrote of how the ancestors established their philosophy of preservation and conservation as a foundation on which future generations could build. Rangimarie Rose Pere relates the concept of conservation to that of whenua (meaning both land and placenta):

> The land for me has the same significance as the placenta that surrounds the embryo in the womb – the Māori word 'whenua' is the term used for both the land and the placenta. Each living thing has a mauri, a life-force that relates to, and interacts with, the earth's forces (Pere 1982).

Respecting and valuing the Māori world view and Māori concepts is an essential first step to understanding the iwi/hapū perspective of ecosystems. The term ecosystem needs to be understood within Māori contexts and frameworks (e.g. Douglas 1984; Awatere et al. 2011, 2012) to be meaningful to Māori and allow them to participate more fully in dialogue, protection and sustainability of ecosystems through inclusive management planning and policy setting.

MĀORI CONCEPTUAL MODELS OF ECOSYSTEMS

The traditional Māori world view acknowledged a natural order to the universe, a dynamic system built around the living and the non-living. For Māori the modern use of the terms ecosystem and ecosystem services can be explained through traditional knowledge and the interwoven concepts of whakapapa, mana and kaitiakitanga, and possession of the spiritual qualities of tapu, mauri, and wairua.

Traditionally Māori realised that shifts in mauri (life force, life spirit) of any part of the environment, for example through use, would cause shifts in the mauri of immediately related components. As a result, the whole system is eventually affected. All activities and relationships were bound up and governed by mythology, tapu, and an elaborate system of ritenga or rules. The process used by Māori to guide resource use reflects this belief in the interrelationship of all parts of the environment.

Several sophisticated cultural models based on a blend of mātauranga Māori, traditional concepts, and Western scientific knowledge have been developed in the last 15 years to provide Māori with assessment and monitoring tools to express and articulate their values and perspectives, by recording changes to the environment and ecosystems. They also provide a means to explain broad international concepts such as sustainability (Jollands and Harmsworth 2007). These models and cultural tools help connect humans, activities, and use, to ecosystems. They are being increasingly used to provide cultural perspectives, through resource management frameworks for planning, policy and decision-making.

Three well-known cultural assessment models are briefly described: the Cultural Health Index (CHI), Māori wetland indicators, and the Mauri Assessment model. The Cultural Health Index and its assessment methods are becoming commonly accepted, adapted, and used by many Māori groups around New Zealand; the wetland indicators provide an important approach to underpin wetland restoration and enhancement of ecosystems; while the mauri model provides a useful framework for many assessments linking ecosystems and human well-being. These approaches, among others, form the basis for Māori environmental monitoring in New Zealand, especially in regard to fresh-water ecosystems (Douglas 1984; Tipa 2006a, b; Harmsworth et al. 2011) and to restoration of biodiversity/cultural values (Harmsworth 2002)

Cultural Health Index (CHI)

The Cultural Health Index was developed from 1999 onwards to provide Māori groups (iwi/hapū, kaitiaki) with a tool to express their cultural values relating to river and stream health and customary resources (i.e. mahinga kai) in a way that could be incorporated into catchment management decisions. The CHI lists several cultural indicators – heritage sites, taonga species

(flora and fauna), water quality, mahinga kai – collectively assessed as mauri. Details of the tool are well documented (Tipa 1999; Tipa and Teirney 2003a, b, 2006a, b; Townsend et al. 2004; Harmsworth et al. 2011). It provides a scoring 'index' for assessing streams and rivers. The index comprises a score (e.g. A-1/2.9/4.1) for recognising and expressing Māori values, and can be used as an indicator for environmental reporting. It can be used for entire river and stream catchments rather than solely for small sections or sites along a river/stream. Three components make up the numeric index at any given river or stream site:

- Establishing the relationship or association by tangata whenua, iwi/hapū (site status)
- Evaluating mahinga kai values (mahinga kai measure)
- Assessing stream health (stream health measure)

Māori wetland indicators

Māori wetland indicators were developed (1998–2002) as part of a large national project 'Coordinated Monitoring of New Zealand Wetlands' (Harmsworth 2002). The aim was to develop a Māori-based monitoring approach for assessing wetlands together with a set of indicators based on mātauranga Māori. The project was carried out using participatory research with a number of iwi and hapū throughout New Zealand. The pressure–state–response model (OECD 1993, 1997; MfE 1998) was used to develop the main indicator groups and more specific or key indicators in each group. Within a participatory research framework the model was explained to Māori as:

- What's causing the problem(s)/issue?
- What taonga and mauri will be assessed or recorded?
- What are the trends (through time), how will you know if the wetland is getting better or worse (from a cultural perspective)?

A final set of nine key Māori indicators, largely based on mātauranga Māori, included mauri, recording extent and abundance of taonga iconic species, percent change in spatial area through time, and increases/decreases in perceived problem or exotic species. The indicators were strongly linked in order to measure trends and assess progress towards desired cultural and environmental aspirations and goals for wetland restoration or rehabilitation. The methods were developed to complement other Māori and scientific approaches and to support cultural impact assessments and long-term monitoring programmes (Harmsworth 2002; Jollands and Harmsworth 2007).

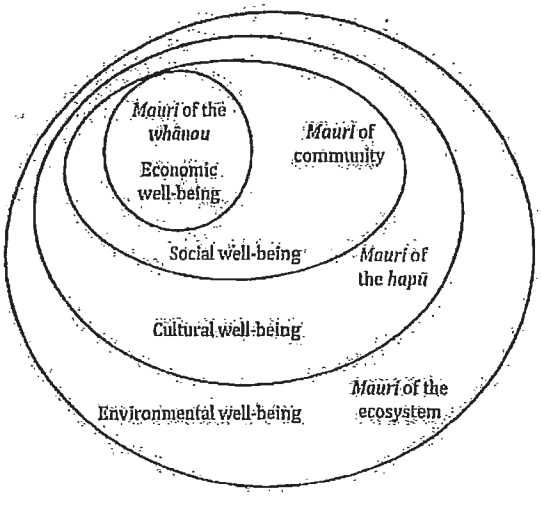

FIGURE 3 A decision-making tool for assessing the important cultural concept of mauri (from Morgan 2003).

Mauri assessment model

The Mauri Model (Morgan 2003, 2006a, b, 2007) was developed from 2002 onwards as a framework, assessment method, and decision-making tool to integrate economic, social, cultural dimensions – regarded as subsets of the environment. It is based on the concept of mauri. As such, the tool demonstrates methods for understanding the interrelatedness or interconnectedness of all living things, and for measuring sustainability and human well-being. From an indigenous perspective it measures the impacts of certain (anthropogenic) activities and practices on the mauri within four key aspects: ecosystems (environmental), hapū (cultural), whānau (economic), and communities (social) (see Figure 3).

The model's aim is to assist decision-making by helping understand how different activities impact on the intrinsic values of ecosystems, and showing the interrelatedness between sustainability dimensions. It therefore helps improve resource management and sociocultural outcomes by (1) measuring impacts on cultural, social, economic and environmental dimensions from an indigenous perspective, (2) integrating te ao Māori values and knowledge into Western models of sustainability, and (3) analysing both institutional and environmental performance

The relative importance of aspects can be addressed independently by users and decision-makers choosing a weighting applied to each aspect before scoring is completed and hierarchies developed. Impacts on the mauri (Figure 4) can be regarded as:

- Strong
- Weak
- Exhausted

Six ratings of mauri are given for each aspect:

- Highly sustainable – 5
- Viable practice enhancing the mauri – 4
- Contributing to mauri – 3
- Neutral – 2
- Diminishing the mauri – 1
- Significantly diminishing the mauri and the resource – 0

The resulting effect of activities and practices on the mauri (Figure 4) will be seen as: –2, destroyed mauri (mauri mate); –1, diminishing mauri (mauri noho); neutral; +1, maintaining mauri (mauri mahi); +2, enhanced mauri (mauri ora/kaha. Evaluation methods identify whether an option/development/practice is:

- Enhancing
- Diminishing
- Neutral

MĀORI MODELS OF WELL-BEING

A number of holistic models of well-being and human health have been proposed, based on Māori traditional knowledge and understanding. Most were postulated as a part of a renaissance in Māori culture, education, and politics in New Zealand in the

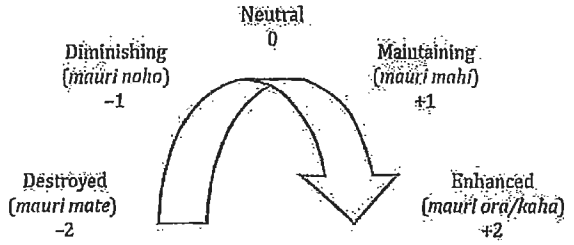

FIGURE 4 Assessment of mauri (from Morgan 2003).

1970s. These models are particularly useful when linking Māori well-being to the natural environment as they demonstrate Māori relationships with and dependency on environmental conditions.

Māori believed at the time, however, that the models' health focus was too narrow and too concentrated on physical illness. As Māori participation in the health debate grew, several perspectives were advanced by Māori, all emphasising the need to better balance traditional belief systems and cultural values with Western approaches to health (Durie 1994).

These health perspectives were in accord with contemporary Māori thinking, especially in their advocacy of greater integration and (w)holism. Three models became widely accepted and have since formed the basis for modern health programmes for Māori and non-Māori in New Zealand:

- The Whare Tapa Wha
- Te Wheke
- Ngā Pou mana

These three main Māori well-being models are presented in Table 1 (from Durie 1994).

TABLE 1 Three common Māori well-being models (Durie 1994)

	Whare Tapa Wha	Te Wheke	Ngā Pou Mana
Components	Wairua	Wairuatanga	Whānaunga-tanga
	Hinengaro	Hinengaro	Taonga tuku iho
	Tinana	Tinana	Te Ao tūroa
	Whānau	Whānaungatanga	Turangawaewae
		Mana ake	
		Mauri	
		Ha a koro ma a kui ma	
		Whatumanawa	
Features	Spirituality	Spirituality	Family
	Mental health	Mental health	Cultural heritage
	Physical	Physical	Environment
	Family	Family	Land base
		Uniqueness	
		Vitality	
		Cultural heritage	
		Emotions	
Symbolism	A strong house	The octopus	Supporting structures

The Whare Tapa Wha model compared health to the four walls of a house, all four necessary to ensure symmetry and balance, and each representing a different dimension: taha tinana (the physical side, the body), taha wairua (the spiritual), taha hinengaro (the mental – thoughts and feelings), and taha whānau (the family). To treat the whole person and achieve well-being all four dimensions must be in balance.

The Wheke (8-legged octopus) model extended these four dimensions to eight, adding mana ake (the unique qualities of each individual and family, to create positive identity), mauri (the life-sustaining principle in all people and objects), ha a koro ma a kuri ma (breath of life from ancestors), and whatumanawa (the open and healthy expression of emotion). The collective waiora – the total well-being for the individual and family – is gained from a combination of these dimensions, and is represented in the model as the eyes of the octopus.

The Ngā Pou mana (four supports) model described a full set of values and beliefs as pre-requisites for health and well-being (Henare 1988; Durie 1994). The model placed greater emphasis on the external environment and the significance of oral tradition. Again with four key supports, the interacting variables for both individual and group well-being included whānaungatanga (the importance of the family), taonga tuku iho (cultural heritage), te ao tūroa (the natural environment) and Turangawaewae (the land base, a place of belonging, standing and identity).

Taha wairua is generally felt by Māori to be a significant and integral part of Māori well-being. As Durie (1994) explains, 'It implies capacity to have faith and be able to understand the links between the human situation and the environment. Without a spiritual awareness and a mauri (spirit and vitality) an individual cannot be healthy and is more prone to illness and misfortune.' 'Belief in god is one reflection of wairua, but it is also strongly evident in relationships with the environment.' 'Land, lakes, mountains, reefs all have a spiritual significance quite apart from economic and agricultural considerations, and are regularly commemorated in song, tribal history, and formal oratory.' 'A lack of access to tribal lands or territories is regarded by tribal elders as a sure sign of poor health since the natural environment is considered integral to identity and fundamental to a sense of well-being' (p. 71).

The Ngā Pou model also emphasises that well-being is affected not just by access to or quantity of natural resources but also by their state or condition. Therefore the loss of land, pollution (through sewage effluent and other contaminants) affecting traditional areas of food gathering, and the depletion of natural resources are all destabilising factors on health and well-being, and debase spiritual and cultural values. Particular reference to the natural environment (Te Ao Tūroa) was made by a large number of Treaty of Waitangi claims (Waitangi Tribunal), especially the series of 1980 landmark decisions responding to the pollution and modification of culturally significant waterways. All these claims recognised the significance of a clean environment for good health.

MĀORI ASPIRATIONS

The 2000 Millennium Declaration was adopted by 189 countries and in 2005 eight Millennium goals were set by the United Nations: end of poverty and hunger; universal education; gender equality; child health; maternal health; combat HIV/AIDS; environmental sustainability, and global partnership. Following the 2000 declaration the United Nations led Millennium Ecosystem Assessment was carried out between 2001 and 2005 (MEA 2005a, b) to assess the consequences of ecosystem change for human well-being. The reports (MEA 2005a, b) made strong links between human well-being and ecosystems, and linked the Millennium Development goals to ecosystem services. A number of development goals linked to ecosystem services were identified: health; natural hazard protection; adaptation to climate change; freshwater provision; environmental conservation; food production; poverty reduction; and energy security (MEA 2005a,b; WRI 2008).

In various forums and reports Māori have also stated their development aspirations, which have been universally and regularly considered and discussed at national, regional, tribal, and local hui (e.g. Hui Taumata – the Māori economic development summit, 1984). Many aspirations were generic, such as well-being and wealth creation. Māori self-determination is about the advancement of Māori people, as Māori, and the protection of the environment for future generations. The modern concept of

Māori development stresses notions of economic self-sufficiency, social equity, cultural affirmation, and a greater measure of Māori autonomy (Durie 2003).

TABLE 2 Generic national aims of Māori self-determination (Durie 2003)

The aim of Māori advancement	The aim of affirming Māori identity	The aim of environmental protection for future generations
Economic self-sufficiency	Personal identity	Land and forests
Social equity	Whānau identity	Rivers and lakes
Cultural affirmation	Hapū identity	Harbours and the sea
Political strength	Iwi (tribal) identity	Air
	Identity as a Māori nation	Environmental links with humankind

Following on from national hui in the 1980s and 1990s, Māori developed common aspirations, many progressing towards Māori self-determination, through a series of development frameworks and strategies and produced steps towards generic national aims and outcomes (Durie 2003) (see Table 2). A good outcome was described by Durie (2003) as being 'where Māori resources are plentiful and in development mode'. Desired outcomes and indicators developed as part of a national development framework and agenda are summarised with examples in Table 3. Two broad outcome domains were given:

- Human capacity (reflects the way in which Māori participate as Māori in society generally, as well as in Māori society – as individuals and groups);
- Resource capacity (on which the human capacity is built) and refers to the state of Māori resources, including cultural and intellectual resources as well a physical resources.

In terms of Te Ao Turoa, the Māori world view places value on the whole environment (natural modified, urban) using concepts and values such as kaitiakitanga (Marsden and Henare 1992; Roberts et al. 1995; Awatere et al. 2011) in all decision-making. A good result produces ongoing respect and application of Māori values in all ecosystems management, where Māori knowledge systems sit equally alongside Western science to manage and enhance ecosystems and taonga (e.g. culturally significant flora and fauna), where Māori are part of all decision-making processes for resource management, where Māori derive sustained direct and indirect benefit from ecosystem services, and where Māori aspirations are understood and fulfilled.

THE MODERN MĀORI ECONOMY

In a contemporary context Māori rely on traditional resources for customary practice but also have extensive interests in agriculture, forestry, fishing, aquaculture, horticulture, urban and rural development, and eco-tourism, all of which are based on healthy ecosystems and sustainable natural resources.

While Māori understand ecosystems from a traditional Māori values perspective, they also see ecosystems as underpinning the modern vibrant Māori economy (Te Puni Kōkiri 2002; Whitehead and Annesley 2005; BERL 2011), where Māori have major assets and wealth in the primary sector, particularly in pastoral farming, cropping, horticulture, forestry, and fisheries. About 52% of the Māori economy is concentrated in the primary industry (Te Puni Kōkiri 2007) and therefore depends heavily on the protection, management, and sustainability (Harmsworth 2009) of natural ecosystems. These productive landscapes provide Māori with an economic base on which to achieve individual and group aspirations and prosperity. This productive base of high natural capital provides services and benefits, to help sustain human well-being. While Māori regard themselves as kaitiaki of all lands, water, forests and fisheries, collectively in 2010 Māori owned only about 6% or 1.5 million hectares of the total New Zealand land area. In 1840 the land area used by Māori, along with natural resources, was nearly 100% of New Zealand. Over time, since European settlement, land ownership has become increasingly fragmented as a result of national legislation and policy that has essentially individualised and privatised land title, alienating Māori from much of the land and water resources formerly available to them. Following Treaty of Waitangi settlements, however, Māori now own about 20% of the fisheries resource and the estimated value of Māori exports in 1999/2000 was about $650 million (NZIER 2003) and in 2001 the total annual tax contribution from the Māori economy was $2.4 billion (NZIER 2003).

The Māori contribution to New Zealand's farming economy is significant, for example, in 2003 Māori were farming 720 000 ha mainly in sheep, beef and dairy. In the early 2000s more than 15% of the country's sheep and beef exports came from Māori farming interests, and in 2010 Māori owned around $NZ 100 million worth of shares in Fonterra, the largest NZ dairy company. It was estimated that in 2003 the annual agricultural and forestry production from Māori communally owned land assets was approximately $750 million, contributing 7.5% of New Zealand's total annual agricultural outputs (NZIER 2003). As the Māori asset base grows, so does its contribution to local, regional, and national economies.

CULTURAL VALUES AND ECOSYSTEMS

A value can be defined as an 'enduring belief that a particular mode of conduct (e.g. being courageous, honest, loving, obedient) or a state of existence (e.g. peace, equality, pleasure, happiness) is personally and socially desirable' (Rokeach 1973; Gilbert and Hoepper 1996, p. 59). For the New Zealand context the Ministry of Education (2005), after an extensive review of national and international literature, developed this definition: 'Values are internalised sets of beliefs or principles of behaviour held by individuals or groups. They are expressed in the way people think and act. They are based on cultural, religious, philosophic and spiritual traditions, and on current critical reflection, dialogue and debate'.

Cultural values cum services were defined by Costanza et al. (1997, p. 254) as 'aesthetic, artistic, educational, spiritual, and/or scientific values of ecosystems'. This definition was expanded by the Millennium Ecosystem Assessment (2005, p. 894) to include 'the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experience, including, e.g. knowledge systems, social relations, and aesthetic values'. These types of cultural non-material or 'non-use' values are included within ecosystem services in all prominent typologies (Costanza et al. 1997; Daily 1997; de Groot et al. 2002; MEA 2005a) but in practice have received very little attention in ecosystem services research (Chan et al. 2012a, b). In New Zealand, these types of values were defined under the Resource Management Act 1991 (RMA) as 'amenity' or 'character' values (Legget 1996) and are commonly used by planners. Amenity values are defined in the RMA as 'those natural or physical qualities and characteristics of an area that contribute to people's appreciation of its pleasantness, aesthetic coherence, and cultural and recreational attributes'.

TABLE 3 Māori aspirations defined as outcome goals and classes by Durie (2003)

Outcome classes	Outcome goals	Indicators	Examples
Te Manawa—a secure cultural identity	Positive Māori participation in society as Māori	Māori active in government, business, industry and decision-making, etc.	Number of Māori in managerial positions, number of Māori MPs, equitable educational achievement, sector employment, Māori decision-making at local government level
	Positive Māori participation in Māori society	Māori active in their communities, whānau, marae	Activities at whānau and marae level, number of people living in tribal areas, networks, etc.
Te Kāhui—collective Māori synergies	Vibrant Māori communities	Organised Māori community networks, institutions	Māori community standards of living, number of marae & condition
	Enhanced Whānau capacities	Strong and supportive families	Levels of Māori well-being
	Māori autonomy (tino rangatiratanga)	Māori practising self-determination	Decision-making in local politics, active kaitiakitanga groups
Te Kete Puāwai—Māori cultural and intellectual resources	Te reo Māori in multiple domains	Increased use of Māori language	Number of fluent Māori speakers by iwi and nationally, use of te reo Māori in society
	Practice of Māori culture knowledge, and values	Māori values and mātauranga Māori being used across institutions	Māori knowledge systems developed and being regularly used
Te Ao Turoa—the Māori estate	Regenerated Māori land base	Area of Māori land and resources	Māori registered land area quantified
	Guaranteed Māori access to clean and healthy environment	Māori participation in monitoring and state of environment reporting, Mātauranga in all ecosystems assessment	State and condition of mahinga kai, quantity and condition of flora and fauna;
			abundance/presence/absence of taonga species
	Resource sustainability and accessibility	Māori have access to clean and healthy resources and ecosystem services	State and condition of natural resources in tribal areas

TABLE 4 An ecosystem services classification framework of provisioning, regulating, cultural and supporting services showing the 33 main service subcategories for New Zealand (Dymond et al. 2012)

			Important services to assess in NZ	Natural ecosystems	Production ecosystems
Total value of ecosystem services	Direct use values	Provisioning services	Food: crops	Forest	Pasture
		Regulating services	Food: livestock	Shrubland	Cropland
	Indirect use values	Cultural services	Food: aquaculture	Grassland	Orchard
		Supporting services	Food: capture fisheries	Alpine ecosystem	Forest
	Passive values	Option values	Food: wild foods	Subalpine shrubland	
		Existence values	Fibre: timber and wood fibres	Wetland	
		Bequest values	Fibre: others	Estuary	
			Biomass fuel	Mangroves	
			Freshwater	Lake	
			Genetic resources	River	
			Minerals	Marine	
			Physical support for dwellings		
			Climate regulation (global)		
			Water regulation		
			Water purification and waste treatment		
			Erosion regulation		
			Pest regulation		
			Disease regulation		
			Pollination		
			Air quality regulation		
			Natural hazard regulation		
			Spiritual and aesthetic values		
			Recreation		
			Tourism		
			Sense of belonging		
			Soil formation and maintenance		
			Provision of natural habitat free of weeds and pests		

Māori 'cultural values', as explained above, are based on the traditional Māori belief and knowledge system, which is the foundation from which Māori seek to understand and comprehend their world, ethics, behaviour and protocols; form perspectives; create new knowledge; and determine strategies and priorities to achieve Māori goals and aspirations (at global, national, regional and local levels). These aspirations include: economic prosperity; protection and management of the environment and cultural resources through concepts such as kaitiakitanga; Māori advancement through increased knowledge, social, and decision-making capacity; social and economic equity; a strong cultural identity; Māori health and well-being.

Cultural values such as these are difficult to define – Chan et al. (2012b) calls them 'ill fitting' – and they are usually categorised as 'non-use' or non-materialistic, non-monetary values that are less tangible and 'extremely difficult to define and package using economic instruments' (Awatere 2005, 2008; Steenstra 2010). For Māori, therefore, cultural values can include such aspects as the spiritual (wairua), sacred (tapu), metaphysical (e.g. mythology, beliefs, superstition), intrinsic, customary (e.g. protocols – tikanga), ethics-integrity, education-knowledge, amenity, heritage, well-being, recreation, and prestige and authority (mana). These values underpin (and transfer into planning) policy and actions that can be expressed in areas such as protection and management of traditional cultural sites, resources, and ecosystems – such as sacred sites (wāhi tapu), burial grounds (urupā), mahinga kai (customary harvest), traditional places and sites (wahi taonga), sustaining customary flora and fauna and natural resources (habitats and taonga species, plants, animals, birds, water) and safeguarding and strengthening the language and culture (e.g. te reo Māori, whakatauki, mōteatea, waiata, haka). They are also values not readily open to trade-offs.

The term 'cultural values' for Māori includes values that can be either tangible or intangible, material or non-material, use or non-use, qualitative or quantitative, and the extent of the term 'cultural values' needs to be fully understood and elaborated. For Māori, achieving aspirations requires a careful balance of a complete range of values from non-monetary to monetary, non-use to use. This extends the term 'cultural values' for Māori to also cover 'use' values (e.g. for economic prosperity and well-being) that are more tangible. Therefore, Māori wish to achieve their development needs and aspirations through a combination of 'use' and 'non-use' values, and would prefer that their values were not defined merely as 'non-use'. Rather, all Māori values should be considered when making decisions in regard to ecosystem services.

ECOSYSTEM SERVICES

Humans derive benefit from a multitude of resources, processes, products and assets from the natural environment and its ecosystems. These are termed ecosystem services. The 2005 Millennium Ecosystem Assessment (MEA) grouped ecosystem services into four main categories:

- Provisioning services, such as fresh food, water, timber, and fibre
- Regulating services, such as the regulation of climate, floods, disease, wastes and water quality
- Cultural services, such as offering recreational, aesthetic, and spiritual benefits
- Supporting services, such as soil formation, photosynthesis, and nutrient cycling

Using the four main MEA (2005a) categories of ecosystem services, Dymond et al. (2012) identified, defined, and listed 33 main service sub-categories of ecosystems in New Zealand (Table 4). These services make up a comprehensive ecosystem classification framework whereby trends and measures can be assessed.

It was stated (MEA 2005b) that 'an ecosystem services assessment can help build a bridge between development and environmental communities by providing credible and robust information on the links between ecosystem management and the attainment of economic and social goals'. It therefore provides 'benefits of ecosystems services, so that decision-makers can understand how their actions might change these services, consider trade-offs among options, choose policies to sustain a mix of services', etc. Yet the MEA (2005a, b) found that the majority of ecosystem services were in a serious state of decline. An assessment of ecosystem services provides the connection between environmental issues and people. 'Reconciling economic development and nature is challenging because they have traditionally been viewed in isolation or even in opposition and the full extent of humanity's dependence on natures benefits or ecosystem services is seldom taken into account by development or environmental communities' (MEA 2005a, b).

Ecosystem services in the Millennium Ecosystem assessment were defined as benefits whereas Costanza et al. (1997) defined them as values. In the interests of conceptual clarity, Chan et al. (2012b) noted that services are the production of benefits (where benefits can take the form of activities), which are of value to people and accordingly (p. 9) defined 'cultural services' inclusively as 'ecosystems' contributions to the non-material benefits (e.g. capabilities and experiences that arise from human-ecosystem relationships)'.

Māori would agree that a significant component of cultural values transfers into direct and indirect benefits, and some cultural values transfer directly into cultural services while others don't. Many of the 'non-monetary', 'non-material', 'non-use' or more 'intangible' cultural values described previously would fit this definition 'ecosystem contributions to non-material benefits' (Chan et al. 2012b).

For Māori all benefits are reciprocal and not a one-way process, and an important principle in kaitiakitanga is reciprocity (tau utu utu). The principle of kaitiakitanga *entails an active exercise of power in a manner beneficial to the resource.* It can be illustrated by *humans providing benefit to the ecosystem and natural resource, through for example guardianship and sustainability, and means that the ecosystem or resource is sustained, if cared for, and can then provide benefit back to humans.*

ECOSYSTEM SERVICES FRAMEWORKS

Ecosystem services as a concept bridges the gap between ecology and economics and has helped to internalise and take account of values. Although it represents two main perspectives – economic and ecological – it still uses economic valuation techniques to assign a value to ecosystems, but has enabled a common language to be used with economists, and is becoming a useful tool in planning, policy, and decision-making. However, the persistent focus on an 'economic worldview' may have 'closed the door to other social perspectives' (Chan et al. 2012b). Within the broader ecosystem services approach and application, Chan et al. (2012b) therefore says, 'some values do not fit naturally into the ES approach', and there should be a broader consideration of 'ill-fitting' values such as non-use, cultural, intrinsic, and

moral so they are not dismissed as 'hidden externalities'. There should be the appropriate space to understand and take into account these types of values (Chan et al. 2012b) and ecosystem services should not be insensitive to these values. This broader world view of values and ecosystems enables a move towards a more unified, integrated management framework (away from fragmented, single-focus frameworks) as required to sustain and manage ecosystems in the future (Dymond et al. 2012). This view sits very comfortably with Māori. As we emphasise, Māori well-being is integrally linked to the well-being of ecosystems and vice versa. They cannot be separated; through whakapapa humans and ecosystems are inter-connected and humans are significant within the ecosystem.

Therefore ecosystem services frameworks need to accommodate different kinds of values for valuation and decision-making, particularly cultural values. 'The overarching goal is to enhance awareness of the diversity of values that are integral to the ES framework – and ecosystem based decision-making – to motivate a meaningful change in representation and analysis of how human well-being may change alongside ecological change' (Chan et al. 2012b, p. 9).

A MĀORI FRAMEWORK FOR ECOSYSTEM SERVICES

Integration of ecological and economic approaches has provided a major advance to ecosystem services research. However, when working with indigenous groups the complete range of cultural values need to be fully comprehended and understood, that is, both non-use (more traditional, customary) and use values (economic, production). An ecosystem services framework for Māori must recognise that 'cultural values' range across material (e.g. provisioning, regulating, supporting) to non-material values (e.g. customary-cultural, spiritual, sacred). The framework is therefore better structured to categorise all values aligned to the multidimensional goals and aspirations of iwi/hapū. Multiple dimensions together connect economic, social, environmental, cultural, and political aspirations and goals, provide for and strengthen human well-being, and produce an indigenous planning base, alongside mainstream Western perspectives and knowledge. This provides a best-practice model (Figure 5) to achieve integrated sustainability planning and management of natural resources, ecosystems and their components. The participatory and decision-making process framework in Figure 5 shows the pathway to indigenous well-being, as compared with the MEA framework (MEA 2005a, b).

The acknowledgement and recognition of taonga and customary resources is paramount for Māori within an ecosystem management framework. To be effective the framework needs to show what is required to better protect and manage natural resources and deliver ecosystem services to achieve iwi/hapū Māori goals, aspirations and outcomes. Obviously critical to this inclusiveness is participatory decision-making (Figure 5) by indigenous groups in ecosystem policy, planning, and management, to achieve sustainability and enhancement of ecosystems and taonga (i.e. an outcome that can be measured).

MĀORI DECISION-MAKING IN ECOSYSTEM MANAGEMENT

One of the major motivations for ecosystem services research is participation in decision-making (Daily et al. 2009; Chan et al. 2012a) and understanding how decisions affect well-being by causing changes to ecosystems. If we examine this from a cultural perspective, Māori see engagement in ecosystem management as a right, but successful engagement and participation for Māori is

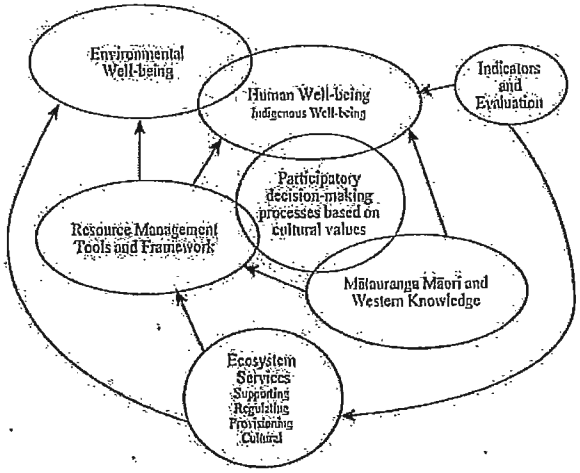

FIGURE 5 Resource management frameworks and participatory decision-making play an important role in helping to secure a strong cultural identity and support Māori well-being. Ecosystem services are only one part of this complex process.

of varied success. Māori are seldom involved in actual decision-making. Although there are well-developed and well-documented models and processes for Māori participation and collaboration in resource management decision-making (Harmsworth 2005a, b; Harmsworth et al. 2011; Awatere et al. 2011), there are still widespread difficulties, often reflecting factors such as lack of genuine commitment, mistrust, lack of respect, lack of knowledge, low capacity, and lack of resources. The most effective models and processes for decision-making are based on the Treaty of Waitangi (Awatere et al. 2011) as shown in Figure 6).

The Treaty of Waitangi

The Treaty of Waitangi (Te Tiriti o Waitangi) 1840 provides the basis for partnership and engagement between Māori and the Crown (the Government). It conferred responsibilities and obligations on subsequent New Zealand governments (representing the Crown) to uphold rights for Māori as British subjects and New Zealand citizens, to protect their land, estates, water, forests and other resources or treasures (taonga). The Treaty, written in

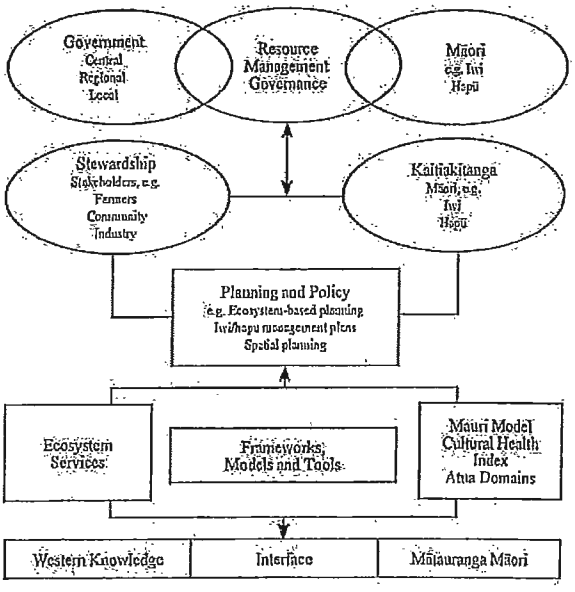

FIGURE 6 A planning framework based on Treaty of Waitangi principles.

Māori and English, has been the origin of arduous debate between Māori and Europeans since 1840, with various interpretations of the text and what it means. However, the principles of the Treaty provide an excellent basis for participation and decision-making by Māori with the Crown and with other stakeholders (e.g. community groups, industry, landowners).

Figures 5 and 6 advocate the position that resource management is a shared responsibility between government and iwi/hapū. The present situation in New Zealand is that mātauranga Māori is sometimes included as an appendage, and generally misunderstood, in a Western planning and policy regime. We advocate a new type of approach that moves beyond the mere co-option of mātauranga Māori into the dominant Western planning paradigm. This mixed-methods approach – where ecosystem services are located within a framework using a suite of tools based equally on mātauranga Māori and Western knowledge (as part of a pātaka or storehouse) – will help inform Māori and non-Māori resource managers. Using a co-planning approach, resource management planners can draw upon a range of planning frameworks, models, and tools based on the dual paradigms to help inform planning and policy.

We are more interested in finding common ground, a space where the ideals of stewardship can work alongside the principle of kaitiakitanga. Care must be taken in differentiating between kaitiakitanga and stewardship – they are not the same thing. While there are some shared characteristics, ultimately kaitiakitanga needs to be seen within a Māori epistemological context that is linked to many other Māori concepts such as whakapapa, rangatiratanga, and mana whenua. Negotiating these differences occurs at the interface of two planning paradigms, the incumbent Eurocentric planning regime and an indigenous planning regime based on mātauranga Māori (Awatere et al. 2011; 2012).

By locating ecosystem services within this type of framework (Figures 5 and 6), the validity of Māori cultural and Western approaches is recognised equally and establishes a more holistic framework for resource management decision-making, giving understanding to cultural values as distinct from cultural services. Because of the relative difficulties of quantifying all values, ecosystem services valuation should be utilised alongside existing qualitative practices such as public forum meetings, hui, focus groups and marae consultation.

DISCUSSION

To solve complex world problems, the Te Ao Pākehā (see Glossary) and international view of the world is becoming increasingly holistic (Figure 7). In fact, in many areas, we are seeing a re-alignment between indigenous and non-indigenous thinking. First, there is a greater need for integrated studies, collaborative learning, and understanding of the interconnected nature of our environment and a move away from a single-focus perspective. Second, different perspectives and knowledge forms are required to understand how different ecosystems work, to define the life-supporting capacity for each of these ecosystems, and to understand the sensitive balance between human beings and nature. Third, there is a need to build capacity at both the individual and community level as a means for achieving greater equity and inclusivity and a requirement for greater participatory decision-making.

One of the most important starting points for understanding where cultural and social values fit into ecosystem services is through constructive engagement and dialogue. In response to increasing pressures and degradation of ecosystems, there is an

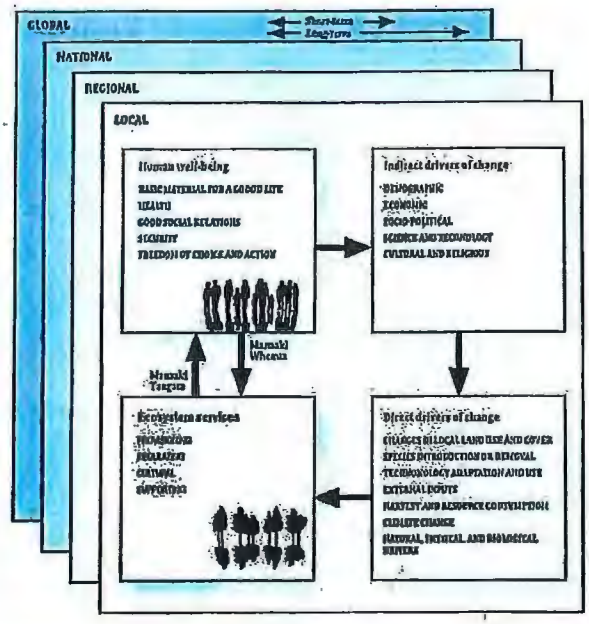

FIGURE 7 Conceptual framework for ecosystem services modified from the Millennium Ecosystem Assessment (from Dymond et al. 2012).

increasing need to understand the sustained flow of benefits from ecosystems for human survival and well-being, with increasing attention to ecosystem management (Chan et al. 2012a). Many frameworks for constructive engagement, dialogue, and collaboration, between various actors (e.g. communities, iwi and hapū, local and central government, industry) have been postulated in New Zealand over many years, and are being continually implemented and evaluated. It is within these collaborative frameworks that ecosystem services can be advanced and adopted (Chan et al. 2012a). In New Zealand, effective and tikanga-based (i.e. customary, correct way, recommended steps) engagement processes with Māori have been well documented (Harmsworth 2001, 2005a, b; Awatere et al. 2011).

Māori wish to be engaged from the beginning of the process (e.g. issues), through research and planning, policy and decision-making, to the end such as actions and activities on the ground. Chan et al. (2012a) has elaborated in several papers that the focus on ecosystem services is to improve decision-making; however, within ecosystem services practice the valuation of material contributions of ecosystems to human well-being has been emphasised, with much less attention to the important cultural and non-material values.

There is an emerging convergence of thinking between the Māori world view and ecological economic epistemologies as to what constitutes ecosystems and ecosystem services and what desirable frameworks are needed to effect change and improve ecosystem management (Figure 7). Māori support the need to recognise, consider, and internalise all values in decision-making through appropriate frameworks, integration, and valuation techniques. Māori have always considered themselves an integral part within all ecosystems, but are loathe to having their values misinterpreted and diluted simply to metrics (i.e. dollars, monetary; Awatere 2005, 2008; Steenstra 2010). The holistic Māori world view sits comfortably to support the view that ecosystems are made up of a 'dynamic complex of plant, animal and microorganism communities as a functional unit' (MEA 2005b). In terms of human values (e.g. spiritual, cultural-customary, amenity, character, aesthetic, recreational, intrinsic, material,

economic) and ecosystem services, the internalisation of cultural and 'non-use' values (non-monetary, amenity, non-materialistic) with non-use and use values (e.g. use values prescribe a dominant monetary, materialistic, commodity, consumption view) side-by-side is an essential prerequisite for more effective management and sustainability of natural resources. This requires a shift from an economic focus to a broader focus.

Within a model (Figure 8) for categorising items in a Māori ecosystem services framework, cultural values are not interpreted merely as non-use or intangible values. Instead, Māori cultural values comprise both use and non-use components and future inclusivity, planning and policy, decision-making and co-management of natural resources require a broader approach to values to be understood and practised (Figure 5). This has important implications for Māori and means their cultural values do not support and should not be considered just within the framework category of 'cultural services' (Table 4) but form an important component to underpin all services (i.e. provisioning, regulating services, cultural services, and supporting services). We therefore propose the terms 'cultural non-use values' and 'cultural use values' within future ecosystem services frameworks to differentiate. It is hoped this broader consideration of cultural values and cultural services will facilitate greater inclusion of indigenous perspectives in decision-making and ecosystem management, and lead to better outcomes for Māori.

CONCLUDING REMARKS

An indigenous Māori perspective of ecosystems and their services has been provided. The Māori world view strongly supports earlier writers' attempts to broaden the economic framework of ecosystem services research to include 'diverse values', particularly non-use or intangible ones (Costanza et al. 1997; Daily 1997; de Groot et al. 2002; MEA 2005a, b; Chan et al. 2012b). However, Māori would prefer to define these values as non-monetary versus monetary, rather than non-use or intangible. Most values for Māori have a 'use' and most ecosystem services have a benefit. Further Māori would like their cultural values considered across a range of services (Table 4; Figure 8): provisioning, regulating services, cultural, and supporting, and not just be seen to equate with 'cultural services' such as non-use, intangible values – although these are significant within the Māori world view. We hope that this indigenous perspective will help reinforce moves for ecosystem services approaches not solely to 'put a dollar value on nature', but to broaden the way we see and use values and ethics, and lead to better practices (Chan et al. 2012b; Dymond et al. 2012). We must also respect and recognise alternative approaches to conveying values, and using ecosystem service frameworks outside of their normal bounds.

We acknowledge and strongly support the inclusion of 'cultural services' in the ecosystem service framework, as it represents a significant category, largely based on 'non-material' 'less tangible' values, consistent with the views of Awatere (2005, 2008). However we have challenged the use of the term 'cultural values and perspectives' to cover only 'non-use', 'non-material' 'intangible' values, and recommend a different type of framework that considers the full spectrum of values from a cultural perspective that can contribute to positive outcomes for indigenous groups through 'the provision of direct and indirect benefits to people from ecosystems' (MEA 2005a). Key questions for Māori are: can we make sensible decisions that embrace all our values without continual reference only to economics – e.g. sole use of dollars? – which generalises our values and denotes arbitrary weightings on natural resources and taonga; and should values be only defined based on the monetary approach of 'use' values to allow quantitative trade-offs to take place? Māori remain sceptical of existing economically biased models because they attach dollars to everything and commonly ask a 'willingness to pay'. Māori suggest introducing more qualitative measures and assessments alongside quantitative measures and assessments so they are regarded equally (Awatere 2005, 2008; Steensma 2010). Much of this comes back to respect and recognition of holistic values that have validity in all decision-making.

A complementary Māori-based framework and model is presented that distinguishes 'cultural values' from 'cultural services' and extends the definition of cultural values across the whole ES framework. Ultimately, Māori wish to use these ecosystem approaches and frameworks to increase participation and inclusion in decision-making, and to achieve multidimensional aspirational goals and desired indigenous outcomes.

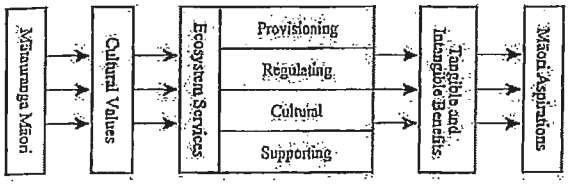

FIGURE 8 A māori ecosystem services framework uses cultural values to underpin all ecosystem services – provisioning, regulating, cultural, and supporting – not just cultural services.

GLOSSARY

Awhinatanga	Assist, care for
Ahi kaa	Continued connection and occupation to place, literally means keeping the home fires burning
Hapū	Pregnant, subtribe
Hui	Inclusive meetings, participatory discussion, workshops
Iwi	Tribe, bones
Kaumātua	Elderly respected male, one with knowledge and wisdom
Kuia	Elderly respected female, one with knowledge and wisdom
Kaitiaki	People, agent who carries out kaitiakitanga, environmental practitioner
Kaitiakitanga	The ethos of sustainable resource management, guardianship
Mātauranga Māori	Māori knowledge and philosophy
Mauri	An energy, internal element, a sustaining life force or spirit, a soul, in all living and non-living things
Mahinga kai	Food gathering area
Manaaki	To provide hospitality, host, look after
Manaakitanga	Reciprocal and unqualified acts of giving, caring, and hospitality
Mana Atua	To live within the realms of a supreme power, departmental gods, divine authority, framework within which kaitiakitanga takes place
Mana Tipuna	An authority derived from the ancestors
Mana Whenua	Rights of self-governance, rights to authority over traditional tribal land and resources
Taonga	Treasured resources, a prized possession, precious resources, iconic species, etc.
Te Ao Pākehā	Non-Māori world view
Te Ao Māori	Māori world view
Marae	Social and cultural centres for traditional and modern iwi/hapū/whānau Māori society
Ngā uri	Respect and recognition of descendants and ancestors
Noa	Open access to resources – but under kaitiakitanga

	practice (still protected, valued, managed)
Papa-tū-ā-nuku	Earth mother
Pepeha	Recitations linking people to place
Ranginui	Sky father
Rāhui	Customary practice to protect and manage resources through regulatory practice and management, use of restricted and open access to resources/places
Taonga	Treasure
Te reo	Māori language, voice
Tikanga	Customary practice, protocol, values
Rangatiratanga	Self-determination, independence or inter-dependence
Tohunga	Knowledge expert, specialist, priest
Tangata whenu	People of the land, connected to place (e.g. river) through a distinct whakapapa
Taonga	Treasure, something treasured, iconic cultural species, customary flora and fauna
Taonga tuku iho	Treasured possessions
Te Ao Turoa	Sustaining resources/taonga at rate and in an acceptable condition that ensures the same options and opportunities for each generation, principle of sustainability
Tapu	Sacred or restricted access to resources, places, for customary and cultural reasons
Turangawaewae	Place of belonging, place of standing
Wāhi tapu	Sacred site
Wāhi taonga	Heritage site
Wairua	The spiritual dimension to life
Waikino	Water that is dangerous, such as rapids
Waipuna	Spring water
Waimāori	Fresh water
Wānanga	Workshops
Waimate	Water that has completely lost its mauri and is no longer able to sustain life
Waiora	Water in its most pure form
Waitohi	Water for rituals
Whakakoha	The act of giving
Whakapapa	Ancestral lineage, ancestral connections, geneaological relationships
Whānau	Family, extended family (incl. cousins, twice, thrice over, etc.)
Whānaungatanga	Family connections and family relationships
Whakatauki	Māori proverb
Whenua	Placenta, land, connection to land and water, the umbilical cord connecting people to place

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Office of Hon Nathan Guy

MP for Otaki

Minister for Primary Industries
Minister of Civil Defence

Associate Minister for Economic Development

B17-0189

09 JUN 2017

Umuhuri Matehaere
Chairman, Motiti Rohe Moana Trust
rohemoana@gmail.com

Dear Umuhuri

Request for temporary fishing closure around Astrolabe Reef

I refer to the request from the Motiti Rohe Moana Trust (MRMT) for a temporary fishing closure over the fisheries waters within 3nm of Astrolabe Reef, Bay of Plenty, and my letter to you of 9 December 2016.

I noted in my letter that I would like to receive, by 1 March 2017, a proposal for fisheries protection around the reef which is supported by all of the relevant tangata whenua groups. I have received no such collective proposal.

Before I can make a decision to impose a temporary closure over an area to fishing, I must be satisfied that a temporary closure meets the criteria provided by the Fisheries Act 1996 to recognise and make provision for the use and management practices of tangata whenua in the exercise of non-commercial fishing rights. In addition, I must have regard to kaitiakitanga.

I have considered your request against these criteria.

I have noted that the proposed area is within the gazetted area/rohe moana of the Tauranga Moana Iwi Customary Fisheries Working Committee (Tauranga Moana), now known as the Tauranga Moana Iwi Customary Fisheries Trust. I have further noted that the three iwi who are represented by Tauranga Moana (Ngāi Te Rangi, Ngāti Ranginui and Ngāti Pukenga) do not unanimously support the request.

This does not presume that Tauranga Moana have exclusive status in the proposed area. Rather, that no other group has shown that they represent a hapū or iwi which is tangata whenua who can also exercise non-commercial fishing rights in the area.

Private Bag 18041, Parliament Buildings, Wellington 6160, New Zealand. Telephone 64 4 817 6821 Facsimile 64 4 817 6521

I cannot be satisfied that the closure will recognise and provide for the use and management practices of tangata whenua in the exercise of non-commercial fishing rights. Therefore, I do not consider that the request, as it stands, meets the relevant statutory criteria, and accordingly I cannot impose a temporary closure.

Yours sincerely

Hon Nathan Guy
Minister for Primary Industries