

**Application for the Haikaimango – Matiatia Marine Reserve,
(Northwest Waiheke Island)
March 10, 2022,
Submission from Vince Kerr, Marine Ecologist**

I am a marine ecologist based in Northland. I support the application for a Marine Reserve as proposed and described by the 'Friends of the Hauraki Gulf'. I have known the Friends of the Hauraki Gulf marine protection group since their beginnings. In this time I have supported their efforts with field studies and advice on creating a marine reserve project and ecological matters generally. Along with the late Dr Roger Grace, and Dr Dan Breen, we completed a habitat map and description of the Northern shore and offshore waters of Waiheke Island; *Subtidal and intertidal habitats of the North Coast of Waiheke Island, Hauraki Gulf*. A technical report was produced for the Friends of Hauraki Gulf Group. In this report, Roger and I summarised and highlighted the habitats present in these waters and the urgent need for protection to begin a process of restoration of the habitats and ecological function for this area. Our report and other science work following our study have made a compelling case for both the need for protection and the special characteristics of this coastline and offshore waters. I submit that in this regard the proposed area ideally fits the requirements of the Marine Reserve Act. The North shoreline of Waiheke Island is a special and ecologically important habitat sitting in the 'mid-Gulf zone' and containing a wide array of representative habitats and special features.

A serious impact of overfishing at Waiheke Island is the extent of kina barrens, (internationally referred to as urchin barrens), on the shallow rocky shore reefs. In our 2013 habitat study, we did not map the kina barrens at fine scale, however, we did a number of scuba dives and close examination of aerial photography as part of the study. We included a description of the kina barrens in the habitats section of the report. I raise this example in regards to this application due to the importance of the ecological damage that is being done and has been done over decades to this crucially important habitat i.e. the shallow kelp forests. Over the last twenty years, I have been involved in various habitat mapping projects and research on kina barrens and the recovery of kelp forests in marine reserves in Northland's East Coast. I have also gained an appreciation from the global literature on the importance of shallow kelp forests. In summary, the primary production and biogenic habitat created by these forests are arguable the most valuable of all the shallow-water habitats. Few people realise the extent of these values that range across virtually every aspect of coastal ecology and many human and economic values. Tragically with this systemic phase shift to a degraded state we are losing this precious component of the shallow NE coast. Kelp forests support most coastal fish species at some point in their life cycle, a significant part of our shallow fish biodiversity is dependent on this habitat. Many or most shallow water commercial and recreational fish species are affected. This is just one aspect, the spinoff effects of habitat loss go across many other pelagic organisms and invertebrates affecting whole food chains. In recent times it has become apparent that crayfish have been so overfished that they are 'functionally extinct' in the Region concerned here. In Cray 1 (Northland's East Coast section) and Cray 2 various Court challenges, (past and pending) of our fisheries management have provided in-depth evidence to document the serious decline of this important species but also the loss to the shallow habitats where this species is a keystone predator, effectively reducing the natural range of crayfish dramatically.

In 2017 along with the late Dr Roger Grace I produced an estimate of this loss of shallow kelp forest habitat for the entire Northland East Coast. This study brought together the habitat mapping work done over the last twenty years and developed a method to extrapolate kina barren spatial extent in known mapped areas to the entire coast, *Estimated extent of urchin barrens on shallow reefs of Northland's East Coast*. This report was prepared for Motiti Rohe

Moana Trust to support their arguments in their landmark successful Environment Court case and High Court Appeal defence which has resulted in restoration action (full no-take reserves) being ordered by the Court. The results of our study are indeed concerning, overall it was estimated that 17% of the shallow kelp forests of the region are in kina barren. Across the various mapped areas, this number ranged from 1% in fully protected Marine Reserves where kelp forest recovers to up to 80% in the worst affected non-reserve areas. The current research I am doing is updating this estimate incorporating field data from new mapping work and taking into account zonation within kelp forests. Our Northern region kelp forests have a strong productivity gradient between the shallow zone (approx. 0-10m depth) and the deeper zone (approx. 11-30m). The shallower zone is highly productive due to the abundance of light received versus the deeper zone where light penetration diminishes dramatically as depth increases. Kina prefers this shallow productive zone and as a result kina barrens are rarely seen below 10-12 m depth, (this varies with the degree of exposure to wave energy and water clarity). Taking this information into account the damage being done to the 'most productive' part of the kelp forest is significantly more than what Roger and I estimated in our 2017 report which used the full depth range of the *Ecklonia radiata* forest to calculate the estimates. This new estimate will have an overall average of over 20% kelp forest loss with higher values for worst-case locations too.

These values are not limited to just rocky reefs. Via drift kelp resulting from storms, this influence is spread across all shallow coastal habitats and plays key roles in many food chains and even provides shelter for pelagic plankton larvae and juvenile fish in a part of their life cycle. While there is a significant body of research internationally to support this assertion, there is a strong case to be made that we need to understand the overall loss and biodiversity and productivity risks that are associated with such a significant trophic cascade scenario of long term stable state kelp forest loss.

The positive side of this tragic loss of kelp forest is that the loss can be reversed if the large resident kina predators, snapper and crayfish can be returned to the reefs. This process has been documented in full no-take reserves such as Leigh and Tawharanui. The reserve proposed at Waiheke Island would create an ideal test case for research into the present degraded state of the shallow kelp forests of the area and the restoration expected under full protection. This is a significant opportunity to extend our knowledge in this area to a mid-Gulf Island location. Future research opportunities needing urgent attention could examine the ecosystem services supplied by a restored algal forest in this location and the importance of our shallow kelp forests in carbon sequestration and support for our climate change response nationally and internationally. Additionally restoring our kelp forests would provide a form of biodiversity insurance and increase resilience for these and adjacent habitats, a goal that will become increasingly important in our future.

In my opinion, the shallow reefs of the North shore of Waiheke fall into the category of worse case examples of kelp forest loss. The Friends of the Hauraki Gulf when examining the ecological losses occurring on their Coast committed themselves to do something about restoring these shallow reefs and their biodiversity. This was the birth of their proposal and remains a major driver of all their efforts. They have been relentless in their research and efforts to engage their community in this project. Throughout this history, Government actions and the Hauraki Gulf process has not delivered a result or a sufficient goal for conservation. I can only support and commend the quality of the application and the validity of the urgency to act in this way.

The benefits of the proposal will ultimately be weighed against any submission against the proposal. I would like to state that there will be substantial benefits from this marine reserve and under the Marine Reserve Act that must in a legal context be carefully considered. I would like to point to Court rulings that have offered the Crown legal guidance and direction on how they should weigh objections to versus benefits of a proposed Marine Reserve under

the Marine Reserves Act. (Note: I refer here to the Judicial Review Akaroa case, (DOC's decline of the Marine Reserve Application was overturned by the Court due to DOC's legally incorrect assessment and weighing of benefits vs objections). Also, an earlier case where commercial Cray fisher's challenged the Rongokako Marine Reserve Application at Whangara. In this case, the Cray fisher's objections were overturned in light of the substantial expected benefits of the proposed reserve. I will simply bullet point a brief list of benefits below. I would be happy to supply further information and references on any of the points raised in this submission or in the bullet point list below.

- The boundaries are well designed with much background work supporting them
- The range of habitats covered is excellent and fully representative of the Island and its mid-Gulf location
- There are high-value rocky reef structures and a complex indented coastline with many variations of exposure adding to the ecological complexity
- The reserve has an ideal location of being proximate to two major channels in this part of the Gulf which will maximize the flow of biodiversity in and out of the Reserve
- The size of the Marine Reserve is significant and has been designed with current knowledge considered on the benefits of this larger size and connectivity with soft sediment areas and the rocky reefs
- There will be very large economic benefits from recreational, science research, education, cultural learning, nature watching and eco-tourism
- Both recreational fishing and commercial fishing will be enhanced via protection of nursery areas, increased production of young fish and spill-over from the build-up of biodiversity in the Marine Reserve
- The proposed reserve will add significantly to a '*Network Effect*' in the Hauraki Gulf as it will support connectivity of biodiversity between the Gulf's existing and additional reserves
- Establishing this significant reserve helps our Region and NZ to meet New Zealand Policy and UN biodiversity protection obligations to preserve and protect biodiversity, habitats, functioning ecosystems and the cultural interests and values associated with these natural systems
- The proposed reserve will provide an insurance policy for the Island and the Gulf against further flow on losses of biodiversity and ecological function from historic and current heavy fishing pressure.

I would like to emphasise that the benefits arising from research and education are diverse and includes the full range of ecological and social aspects mentioned in this submission but is not limited to what I have presented. The experience here and overseas has shown that full take marine reserves provide substantial benefits across wide-ranging fields, many unanticipated. It is significant that for Waiheke Island this potential is enhanced by the relative accessibility of the area to both land-based and boat-based visitors and proximity to NZ's largest city with its research institutions and Universities. As the late Dr Bill Ballantine once famously said about the Leigh Marine Reserve;

'We are only beginning to learn about the benefits and educational values of having a place where nature is allowed to thrive without disturbance of any kind'.

To conclude, I am familiar with the science work done at Waiheke Island backgrounding this proposal and I can personally vouch for the extensive and professional effort that the group has brought to this project and proposal over a 15 year period. I support their arguments and descriptions presented in the Application and wholeheartedly recommend that the Ministers approve the Application.

Note 1: two scientific reports have been attached to this submission

Kerr, V.C., Grace, R.V., 2017. Estimated extent of urchin barrens on shallow reefs of Northland's east coast. A report prepared for Motiti Rohe Moana Trust. Kerr & Associates, Whangarei.

Kerr, V.C., Grace R.V., 2013. Subtidal and intertidal habitats of the North Coast of Waiheke Island, Hauraki Gulf 2013. Report prepared for the Friends of the Hauraki Gulf. Kerr and Associates, Whangarei New Zealand.

Note 2: A complete list of technical reports of my published works reports and expert witness statements for Environment and High Court Cases can be found and downloaded from my consultancy website: <https://kerrandassociates.co.nz/completed-works.html> Relating to a recent Environment Court Case regarding marine protection on Northland's East Coast and in particular Mimiwhangata and the Motiti Court cases there is extensive evidence presented directly relevant to the Waiheke Island Marine Reserve Proposal covering the extent of habitat and biodiversity decline and on the design and benefits of full no-take reserves. There is also specific evidence presented that establishes the causal effect of over-fishing, removal of predators from overfishing and the long term stable phase change effect of what we refer to as kina barren in NZ and urchin barrens overseas. International research and references are also presented in these evidence papers and my various reports which are relevant to what has been presented in the Waiheke Island Marine Reserve Application.