

Resource Management

A gift from the sea: managing kaimoana resources

When coastal seafood resources grow scarce, it is of real concern for the locals who depend on the sea for physical and cultural sustenance. **Sheryl Miller** and **Grace Ormond** are working together to stem declining kaimoana stocks at Māhia-mai-Tawhiti on New Zealand's east coast.

Kaimoana – food from the sea – provides cultural, spiritual, and physical sustenance and identity for coastal Māori. Kaimoana not only sustains the way of life of the individual, but also maintains tribal mana and standing as manifested in the manaaki, or tokens of esteem, shared with manuhiri (visitors). Kaimoana has long been part of the diet of coastal Māori, providing essential vitamins and minerals. It has also been an important resource for trading with inland tribes for goods such as birds, berries, or workable stone.

Coastal kaimoana resources are under intense pressure from over-harvesting and from the effects of increasing development in coastal areas. When bush areas are cleared for housing, forestry, or agriculture, the resulting runoff increases sediment and nutrients in the nearshore marine environment. These types of anthropogenic (manmade) effects are documented worldwide; scientists agree that monitoring marine ecosystems to better understand these effects will help enable their long-term recovery and stability. And detailed description and knowledge of the habitat types and resources within an area can enhance successful management.

Māhia Peninsula is an isolated section of the Hawke's Bay. The Māori who live there, the tangata whenua, are Ngati Rongomaiwahine. They are concerned about the state of their local resources. There is mounting scientific evidence of declining nearshore stocks of fish and shellfish, such as lobster, and anecdotal evidence that other important reef species – such as kina, karengo (red seaweed), and pāua – are also in decline. In addition to over-harvesting, these species may also be suffering from changes to their marine environment caused by coastal development.

NIWA scientists and the tangata whenua are working together to characterise the nearshore stocks and identify the best way forward for preserving and improving kaimoana resources for Māhia-mai-Tawhiti.

Customary care

- Māori living on Māhia Peninsula are concerned over declining customary fisheries, which play an important economic and cultural role in the area.
- Tangata whenua are undertaking various projects to identify and monitor finfish, shellfish, and seaweed resources.
- NIWA scientists are mapping and filming the seabed to characterise the sediments and the algal and animal communities.

Tangata whenua projects

Within Te Māhia rohe, or district, strategies for management of customary fisheries are coordinated through the Rongomaiwahine Iwi Trust. Guidelines for research throughout the rohe are provided in the Māhia Coastal Marine Strategy.

A significant management tool within customary fisheries is the rāhui, a ban on collecting kaimoana resources. The first rāhui at Te Māhia was put in place in 1943. It surrounds the entire peninsula, extending two nautical miles out to sea, starting from Nuhaka in the south to Paretu in the north. This rāhui excludes all commercial fishing with the exception of crayfish. In 1947, three additional rāhui were gazetted. These are located within the 1943 rāhui but exclude non-commercial fishing as well. Four voluntary rāhui (not gazetted) are also in place in the region.

The tangata whenua are involved in a variety of monitoring and research projects. These include boat-ramp surveys of recreational and customary take; running underwater transects to monitor various marine organisms, such as lobster, kina, pāua, and seaweed; reseeding local areas with mussels; and using 'Booth collectors' for calculating the number of juvenile lobster.

What's in a name?

Te Māhia means 'indistinct sound' and the fuller name, Māhia-mai-Tawhiti, means 'murmuring of home'. Māhia Peninsula was once separated from mainland New Zealand. However, beach dunes and sand have accumulated over the last 10 000 years, joining it to the North Island.

Grace Ormond shows a student a juvenile lobster, or puerulus, taken from the Booth crevice collector. The device was designed in the 1970s by former NIWA scientist John Booth for sampling lobster puerulus; the small creatures seek shelter in the crevices created by a spaced stack of plywood squares.



*Piki ake, kake ake, ki Te Māhia e ka kite tana hia hia aue
ko Rongomaiwahine o Nukutaurua e*

*Climb to the summits of Te Māhia, for yonder lies the
beauty of Rongomaiwahine o Nukutaurua e*

From a waiata by Tommy Taurima

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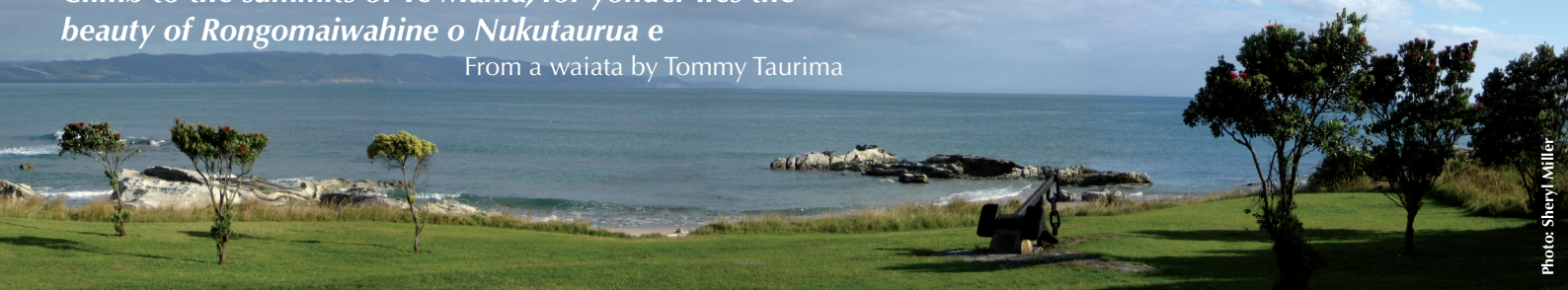


Photo: Sheryl Miller

NIWA projects

Detailed and accurate descriptions of habitats and species are essential for the management and sustainable use of coastal resources by iwi, commercial, and recreational users. Mapping of seabed morphology and substrate composition provides crucial information of the marine habitat and biodiversity.

In May 2006, NIWA scientists mapped four regions of the seabed within Te Māhia rohe, using multibeam echosounders and side-scan sonar technology. We also shot underwater videos and sampled the seabed (benthic) plants and animals. The underwater footage shows a patchy distribution of flora and fauna (such as seaweed, sponges, fish, and sea stars) interspersed with boulders and large amounts of sediment. We are assessing kaimoana resource data collected by tangata whenua, using statistics to find any spatial or temporal patterns.

Further research with the Rongomaiwahine Iwi Trust is investigating the effects of sedimentation on the nearshore marine environment. NIWA scientists will examine the origin of sediment deposition, define the characteristics of the sediment, quantify the amount of sediment entering the nearshore marine environment, and determine its effects on the local kaimoana resources. We also plan to do additional mapping and description of the underwater rocky reef habitat immediately adjacent to the coastline using a side-scan sonar and underwater video. **W&A**

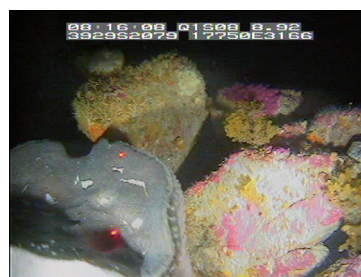
Māhia Peninsula: looking across Oraka Beach to Mahanga.

Further reading and useful link

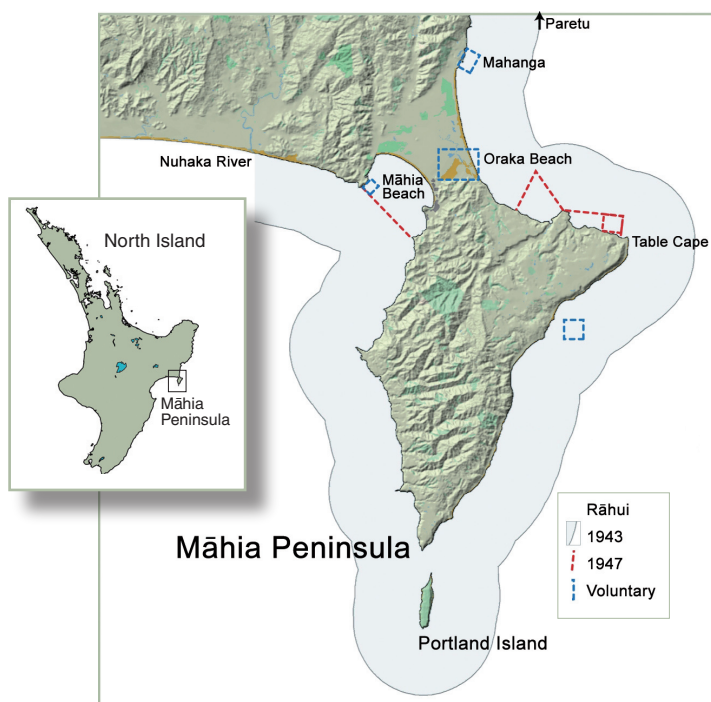
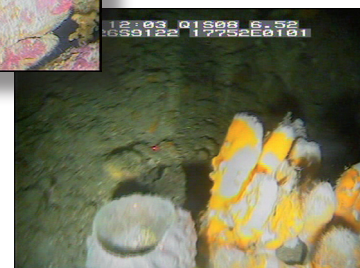
Airolidi, L. (2003). The effects of sedimentation on rocky coast assemblages. *Oceanography and Marine Biology: an Annual Review* 41: 161–236.

Severne, C.; Miller, S.; Ormond, G. (2006). Research on customary fisheries. *Mana* 73: 51.

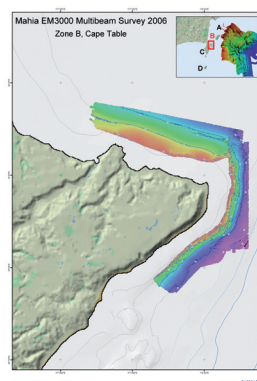
Customary fishing on the Ministry of Fisheries website: www.fish.govt.nz/en-nz/Customary/



Stills from the underwater video illustrate the diversity of the benthic flora of the Māhia Peninsula at depths ranging from 16 to 100 m.



Map: Erika Mackay



Acoustic bathymetric map of Table Cape made with multibeam echosounders and side-scan sonar technology. The different colours indicate changes in the contour and composition, or substrate, of the seabed.

The Māhia Peninsula, with shading and dotted lines marking the mandatory and voluntary rāhui currently in place. In Māori culture, rāhui is a form of tapu (sacredness) restricting access to, or use of, an area or resource. For example, rāhui may be applied to protect a fishing ground under pressure, and to give species of fish, shellfish, and seaweed a chance to increase.

Dr Sheryl Miller (Ngāi Tahu, Kāti Mamoe, Waitaha) is a marine scientist who specialises in seaweed ecophysiology and aquaculture, as well as biosecurity issues. She works with NIWA's Māori Research and Development Unit, Te Kūwaha o Taihoro Nukurangi, and is based in Wellington. Grace Ormond (Ngati Rongomaiwahine) is a member of the Rongomaiwahine Iwi Trust and is the contact for the Mahia Coastal Marine Strategy.

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