

## Boatshed Rock Hauora Moana Survey



### Site Description

Boatshed Rock lies at the southern end on Medlands Beach. The rock and surrounding tidal platform are easily accessible from shore at low tide. The reef structure around the rock tends seaward in a northerly direction. On the seaward side the reef is primarily a low lying platform reef with approximately north-south facing ridges interspersed with narrow sand/cobble channels. The ridges rise approximately 1 to 1.5m above the bottom, with multiple overhangs providing good habitat for fish and invertebrates, including excellent habitat for koura nurseries. This reef extends at least 200m to the north with the depth range down to approximately 8 to 10m. The first approximately 50m of this area is largely bare of ecklonia, except for occasional small clumps on the vertical faces of the ridges. The reef top here is covered primarily in turf algae with probable seasonal variation. There is a moderate to high density of kina on the reef tops which would define the area as an active kina barren. Off the end of the island the reef becomes slightly more three dimensional, with some structures up to 3m high. On the western side of the island the reef slopes quite quickly down to the sand and cobble seafloor and the depth ranges down to approximately 6m, becoming shallower closer to shore. The outer reef areas are well covered in ecklonia forest along with a good variety of other seaweed species.

### Survey Details

**Date:** 20-10-24      **Time:** 11:00      **Tide:** HT 09:52 - 2.7m, LT 16:01 – 0.3m.

**Moon Phase:** Takirau - waning Gibbous (full moon 18-10-24)

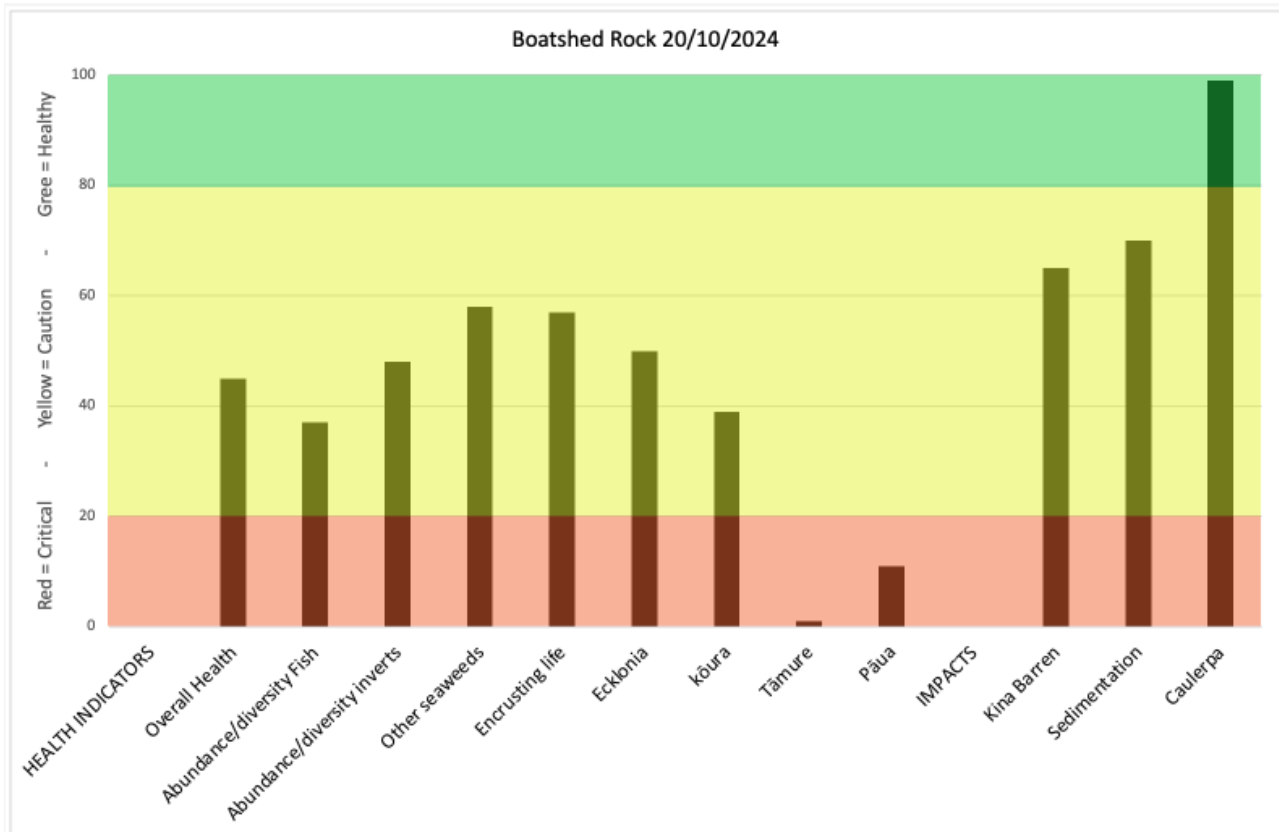
**Weather:** ESE 15, sea slight cloudy 1m NE swell

**Surface conditions:** .5 - 1m swell, no wind chop, slight surge      **Water temp:** 17°      **Visibility:** 2-4m

**Survey Team:** Jack, Johnno, Anne-Marie, Willy, Simon, Ben, Glenn, Richard (Lotte-shore support).

## Survey Results:

**General Impressions:** The general impressions from this first survey were mostly quite positive, as expectations were quite low due to the reports of wide-spread kina barrens in this area (the kina barren area will be discussed further in the concluding remarks). There was a feeling of quietness though, both literally and figuratively. The visibility was definitely affected by the NE swell coming in and the considerable amount of suspended algae (especially red algae) in the water.



## Consensus notes:

**Overall Health (mauri)** We always leave the overall health discussion until the end, so that we can reflect of all the consensus discussions of the other tohu before deciding on our final assessment of the overall health. In this case (as often happens), the original individual scores for overall health were quite close, ranging from just under to just over halfway. Reflecting on the discussions the final assessment ended up being at the lower end of that range.

**Fish abundance and diversity** Overall the abundance and diversity of fish was quite disappointing. An exception was that there were a reasonable number of red moki (Fig 2), several pairs of leather jackets, quite a few spotties etc. However there was a lack of other wrasse species (one banded wrasse was sighted). Other fish sighted included one porae, a small school of parore, two eagle rays and a school of juvenile trevally. In terms of the mauri of this reef, the general consensus was that there just isn't enough diversity or abundance of fish.

**Invertebrate Abundance and diversity** Overall the abundance and diversity wasn't great. There was a lack of echinoderms (starfish, sea cucumbers etc) besides the urchins. Out in the deeper areas there was quite a good range of molluscs, but few crustaceans, other than the koura. In the shallower areas there were also a good range and abundance of molluscs, crabs etc.

**Other seaweeds** The other seaweeds was scored quite highly with a wide variety and good coverage over much of the area. There were large patches of really healthy looking sea rimu, a lot of sea lettuce and other green algae as well as a lot of red algae. What was lacking were the larger seaweeds, like carophyllum species. It is also important to note that much of the green and red algae are seasonal and at their height during early to late Spring, therefore there is a lot more coverage over the reef at this time of year (Fig 3). There were also a couple of tiny patches of the red algae *Champia laingii*.

**Encrusting Life** Overall the encrusting life was quite good with good colour and diversity in most areas. It was noted that the coralline turf was a bit lacking in colour and vibrancy in some areas, especially on the kina barren area, which was more dominated by the Spring algae growth.

**Ecklonia** The amount of remaining ecklonia forest was pleasantly surprising for most of survey team. The areas of dense ecklonia was looking good and healthy (Fig 4), with good adult coverage and good signs of juvenile recruitment. In these areas the individuals were looking really healthy with good clean holdfasts and healthy looking blades. There was also some good sorus tissue (reproductive tissue) on some of the adults. It was mentioned that quite a lot of ecklonia has washed up on the beach over the past few weeks with the Spring storms and Jack noted that he saw signs of the storm damage with broken stipes and holdfasts in some areas. However, it was noted that there is a lot of good ecklonia territory that doesn't have good ecklonia coverage (Fig 5 & 6), particularly around the kina barren area and that the lack of ecklonia there and in other areas where it should be wasn't just storm damage but because of grazing.

**Kōura** The general consensus was that the number of koura sighted was slightly surprising, given the accessibility of this area. There were several nurseries found on the eastern side of the island where the kina barren gives way to more kelp cover. There were also koura observed further out on the northern reef area. Jack made the observation that most of the koura he found were under good kelp coverage and having them there was probably keeping the kina population down in those areas. There were a few of legal size and above, but the majority were juveniles of different sizes. There were also three small packhorse crays observed. Despite the fact that more were seen than expected, the consensus was that there is still far too few to be considered healthy, hence the consensus score in the lower half of the caution zone, closer to the red critical zone than the green healthy zone.

**Tāmure** No tāmure were seen at all, which was disappointing. Richard, who dives the site quite regularly, commented that he would normally expect to see small tāmure around, especially when you crack open kina. There was general agreement that it was surprising not to see any at all, despite several of us cracking open kina at various times throughout the dive to help gauge the fish life.

**Pāua** One small patch of pāua was found by Willy with about six individuals of just below legal size. His assessment was that, given the amount of good habitat, he would expect to see a lot more on the dive, hence his score was still down in the red zone. No one else found any pāua.

**Kina Barrens** One of the main reasons for this survey was to investigate the level of kina barrens. On the whole the team were pleasantly surprised to find that the kina barren area is more or less confined to the shallow reef platform on the eastern side of the island (Fig 1 below). In this area the kina density is moderately high (estimated to be approximately between 6 to 10 per m<sup>2</sup>) (Fig 7). The depth of this area fits within the usual depth range (1 to 7m) associated with kina barrens elsewhere. Several of the survey team commented on the quite abundant and diverse seaweed in this area, but it should be noted that much of this is due to the seasonal Springtime bloom of a wide variety of seaweeds, including red and green algae species (Fig 8). It will be very interesting to monitor how this changes through the

seasons. There are only a few ecklonia kelp plants in this area, which are predominately on the vertical faces. This is common in active kina barren areas, probably because the vertical face makes it more difficult for the kina to graze on the ecklonia. Further seaward, as the depth increases slightly there was generally less kina density, except for a few rocky outcrops with very high density (Fig 9). In this area the kelp cover is much better and this coincided with finding several koura nurseries under the kelp cover.



Fig 1: satellite image of the Boatshed Rock survey site showing the kina barren area.

**Sediment** Due to the swell there was quite a lot of suspended sediment in the water column, but the general consensus was that this was due more the fine grained sand remaining suspended rather than sediment load. It was noted though there is some sediment load coming down the river from time to time.

**Caulerpa:** Thankfully we can report that no exotic *Caulerpa* was sighted anywhere in the survey area. There was however, some very healthy patches of our native *Caulerpa*, the sea rimu (*Caulerpa flexilis*).

**Concluding remarks** This was the first survey for this area and the first time using the survey method for several of the participants. With eight participants in the water and five of them being new to the method, it could be expected that there would be quite a variance in results. However, as we have found elsewhere, the level of consistency in how participants score the tohu is generally very high, with just a few variances in some of the tohu. Most often these variances have less to do with peoples' experience or level of expertise, than it does with what they actually saw, often determined by the different snorkeling/free-diving skills of individuals. Far from being a problem for the method, this usually leads to a more complete assessment, as some participants end up focusing on different areas of the survey site. This is where the consensus discussion plays a critical role in bringing all the different observations together. It also helps to minimise issues of personal bias and shifting baseline syndrome, by ensuring that all voices are heard and contribute to the final assessment.





**Fig 2. Red moki swimming over native sea rimu**



**Fig 3. Spring growth assemblages of sea weeds.**



**Fig 4. Healthy dense Ecklonia on deeper reefs.**



**Fig 5. Solitary ecklonia near kina barrens.**



**Fig 6. Solitary ecklonia with entangled fishing line.**



**Fig 7. Kina density on the kina barren area.**



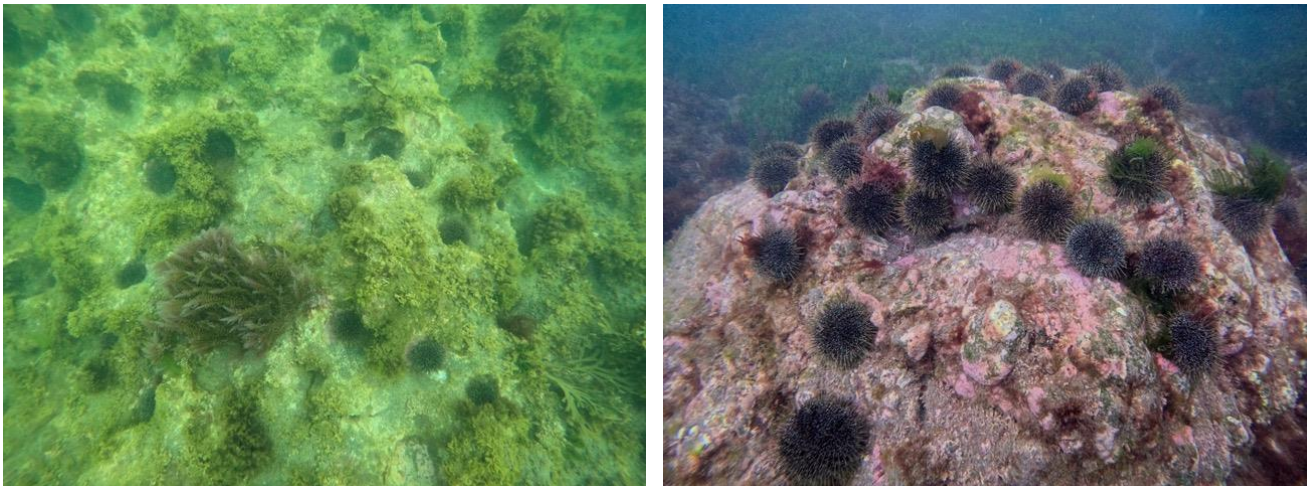


Fig 8. Kina barren density showing Spring algae growth. Fig 9. Kina density on rocky outcrops.

**Kina Barren management discussion** The motivating factor for this survey was concern by residents about the spread of kina barrens around Boatshed Rock. As can be seen from the above satellite image, the main area of kina barren is on the eastern side of the island on the reef flats. The area affected is at least several hundred square metres and a very approximate estimate of the kina population, based on this rapid assessment, suggests somewhere between five and ten thousand kina, possibly substantially more. In undertaking any kind of kina management on this scale there are many factors to consider, the most important being cultural. As kina are an important taonga species for Māori, consultation and collaboration with the mana whenua of this rohe moana is the first step. This is also critical from an Ahu Moana perspective, as the fundamental vision of Ahu Moana is collaboration and partnership between mana whenua and the wider local community. It would be important to follow the lead of mana whenua in developing the tikanga for what approach would be taken.

It is also critical to understand and acknowledge that while kina barrens are an issue, it isn't the fault of the kina themselves, but rather that the kina population has become out of balance because of our activities. The kina are just as much the victims of this imbalance as the ecology of the rest of the reef. Kina population management is a way of starting the process of re-balancing the reef, but without the behavioural changes to address to the cause of the problem in the first place, any benefits of kina management will be short-lived. Once again, this is where an Ahu Moana approach to local co-management of fishing activities could be utilised.

The main options for re-balancing the kina population are culling or removal. Culling involves killing the kina in situ, which is faster, but may be contrary to local tikanga. Culling a large number of kina at once could also have short term effects on the ecosystem by “overloading the food supply and nutrient flow for fish and invertebrates. Spreading the culling out over several weeks or months would negate that issue, but could still pose tikanga issues. The other option is removal, which could be undertaken either as one off large events or via systematic, regular small scale removals.

A large scale “one off” removal of this size would require a good size team of volunteers in the water and a team of volunteers on the shore to process the kina. The benefits of this approach is that the timing of the event can coincide with the optimal time for harvesting when the kina are at their fattest. It can also create a real festive atmosphere and be a great way for the whole community to come together, providing opportunity for cultural sharing and learning. There could also be opportunity to involve the wider community with kina tasting, novel recipes etc. It also offers the opportunity to explore options for utilising the whole kina, making compost tea, using the guts, shells and spines for

compost etc. To do a large scale removal of this sort a customary permit would also be required, which again offers the opportunity for cultural sharing and learning.

Regular, small scale removals are also a viable option. In this case, the systematic removal across the kina barren can be done in stages, by small groups of volunteers. The increased daily bag limit of 150 kina per diver per day would make it feasible to remove substantial numbers of kina depending on how many volunteers you have. This wouldn't require customary permits, but it is highly recommended that this would still be done in consultation and collaboration with mana whenua and follow local tikanga. This method would still require treating the kina with full respect by considering how to make full use of the whole kina.

There are also practical, logistical and health and safety issues to consider.