



PhD opportunities in kelp forest restoration

Like many temperate regions worldwide, the overexploitation of sea urchin predators has led to the destruction of kelp forests by sea urchins on shallow reefs in northern New Zealand. The urchin barrens formed (right) are an indicator or tohu of overfishing, and the loss of *mauri* from shallow reefs. While long-term marine protection has been shown to reverse these patterns, research is needed to develop alternative strategies to managing this problem and restore these important ecosystems.

We are looking for two PhD students to work on the following projects that investigate alternate approaches to restoring kelp forests in New Zealand:

1. Large-scale removal of sea urchins to restore kelp forests

Sea urchins from urchin barrens have poor roe quality and are therefore of little economic value for commercial fishers or as kaimoana for Maori. This project will be carried out in partnership with fishers and iwi, and aim to develop strategies and methods for both restoring kelp forests and enhancing sea urchin quality. It will investigate factors influencing the recovery potential of kelp forests through the experimental removal of sea urchins at coastal and offshore locations in the Hauraki Gulf. The recovery of kelp following urchin removal will be examined through in situ monitoring and drone imagery.

2. Translocating and tracking large rock lobster to restore kelp forests

This project will investigate the potential of restoring large sea urchin predators on reefs as a means of restoring kelp forests. This will expand on an existing project acoustically tracking rock lobster in and around the Cape Rodney to Okakari Point (Leigh) Marine Reserve, and involve tracking the movement of large rock lobster translocated into urchin barrens. Movement and feeding behaviour of translocated and naturally occurring lobster will be compared.

Candidates should have a BSc Honours, Master's Degree or equivalent, with excellent grades, and appropriate research experience. Both projects will involve the use of small boats and scientific diving. Students will require a Rescue Diver qualification and preferably have previous scientific diving experience. Experience in the use of spatial (GIS) and statistical software are also desired.

Three year scholarships are available that include a \$27,900 annual stipend and annual tuition fees. Both positions will be based at the University of Auckland's Leigh Marine Laboratory.

For more information feel free to contact Assoc Prof Nick Shears (n.shears@auckland.ac.nz), Assoc Prof Craig Radford (c.radford@auckland.ac.nz) or Professor Andrew Jeffs (a.jeffs@auckland.ac.nz), who will all be involved in the supervision of these projects.

To apply please send a cover letter, CV and academic transcript to Nick Shears (n.shears@auckland.ac.nz)

