

Marine survey of northern New Zealand




The uniqueness of New Zealand's marine life was confirmed by a trans-Tasman team of 14 volunteer divers, who made a systematic survey of 115 coastal sites in the north of the country. More than a third of the fish species they recorded are found only in New Zealand waters.

This low-cost community science project was the first Reef Life Survey undertaken in New Zealand. Using standard methods, the divers surveyed the biodiversity of each site (about half of which were in marine reserves) to make comparisons across sites and create a 'snapshot' of the region. DOC supported the project, in particular the data analysis and report production.

Clear contrasts were observed between reserve and non-reserve sites, with larger and older fish found in all the marine reserves than at the unprotected sites.

Study sites

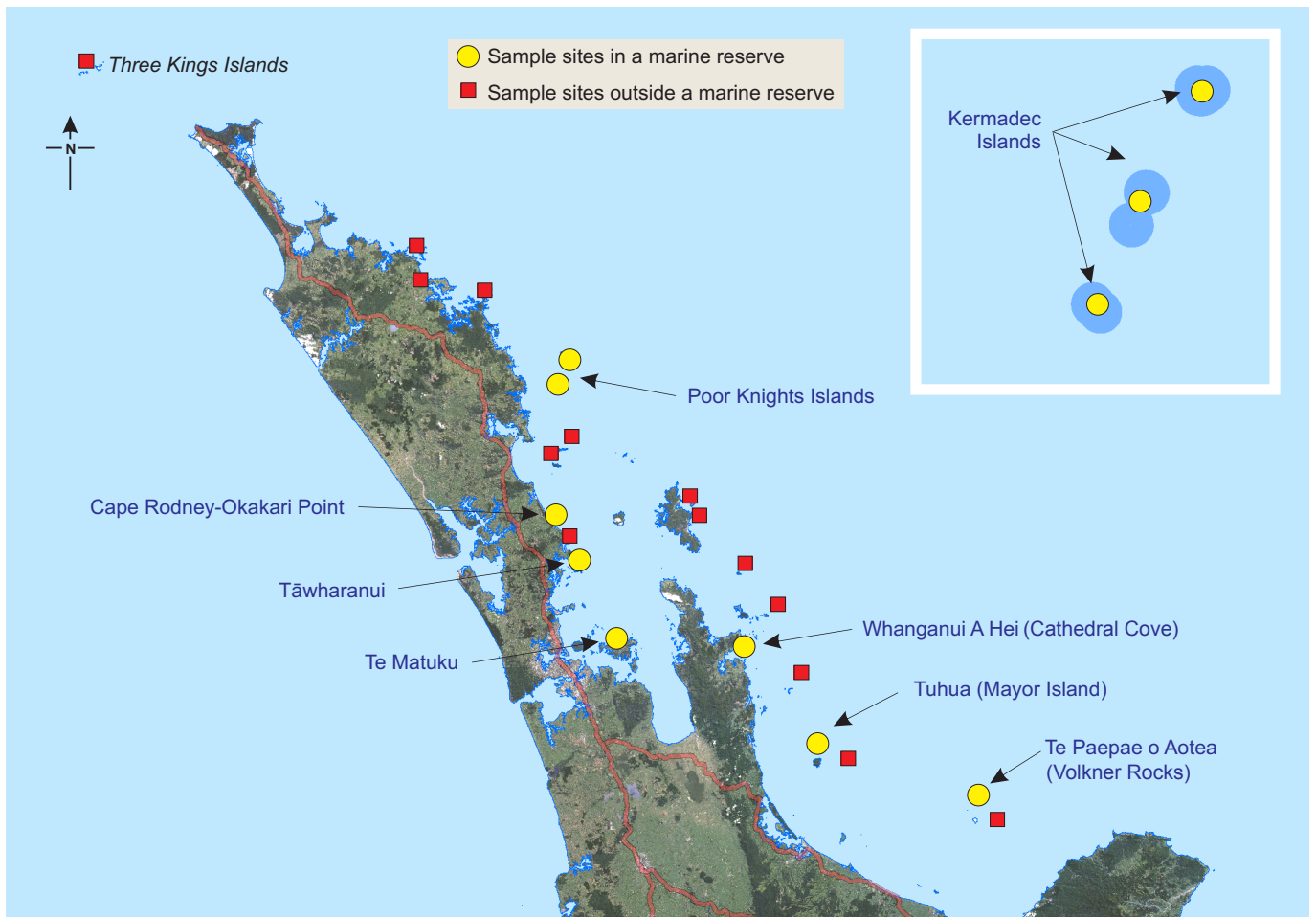
Kermadec Islands 

 Three Kings Islands



Kermadec Islands, Three Kings Islands and 115 sites from Northland to Bay of Plenty.





Map of northern New Zealand showing the surveyed coastline and marine reserve locations.



Short-tailed stingray (*Dasyatis brevicaudata*) in Poor Knights Islands Marine Reserve.

About Reef Life Survey

Reef Life Survey uses volunteer divers to assess marine environments with standardised methods. The divers are trained in species identification then carry out ongoing monitoring in their local area as well as taking part in team surveys. The data they collect is checked, uploaded to a publicly accessible database, then analysed by research groups worldwide.

The programme was established at the University of Tasmania in 2007 to provide low-cost monitoring for the new marine reserves being created in Australia at that time. By 2015 the organisation had surveyed approximately 2,500 sites in more than 40 countries using local volunteers.

The northern New Zealand survey

A team of Australian and New Zealand volunteer divers and boat operators surveyed the rocky reef sites from October to December 2012. Of the 115 sites, 66 were in or near 8 marine reserves, while the remaining sites were interspersed along the coast or near offshore islands, including the Three Kings Islands.

Divers swam along the seafloor, following 50-metre-long lines. They identified and recorded the size of every fish and other marine species (e.g. kina, shellfish, rock lobster) sighted 1 metre (for shellfish) or 5 metres (for fish) from the line. Photos of the seabed were taken at intervals to record the seaweed coverage.

Many of the marine species found in New Zealand are the same or similar to those in southern Australia and Tasmania. The team found that the monitoring methods developed for use in Australia worked well in the New Zealand surveys.

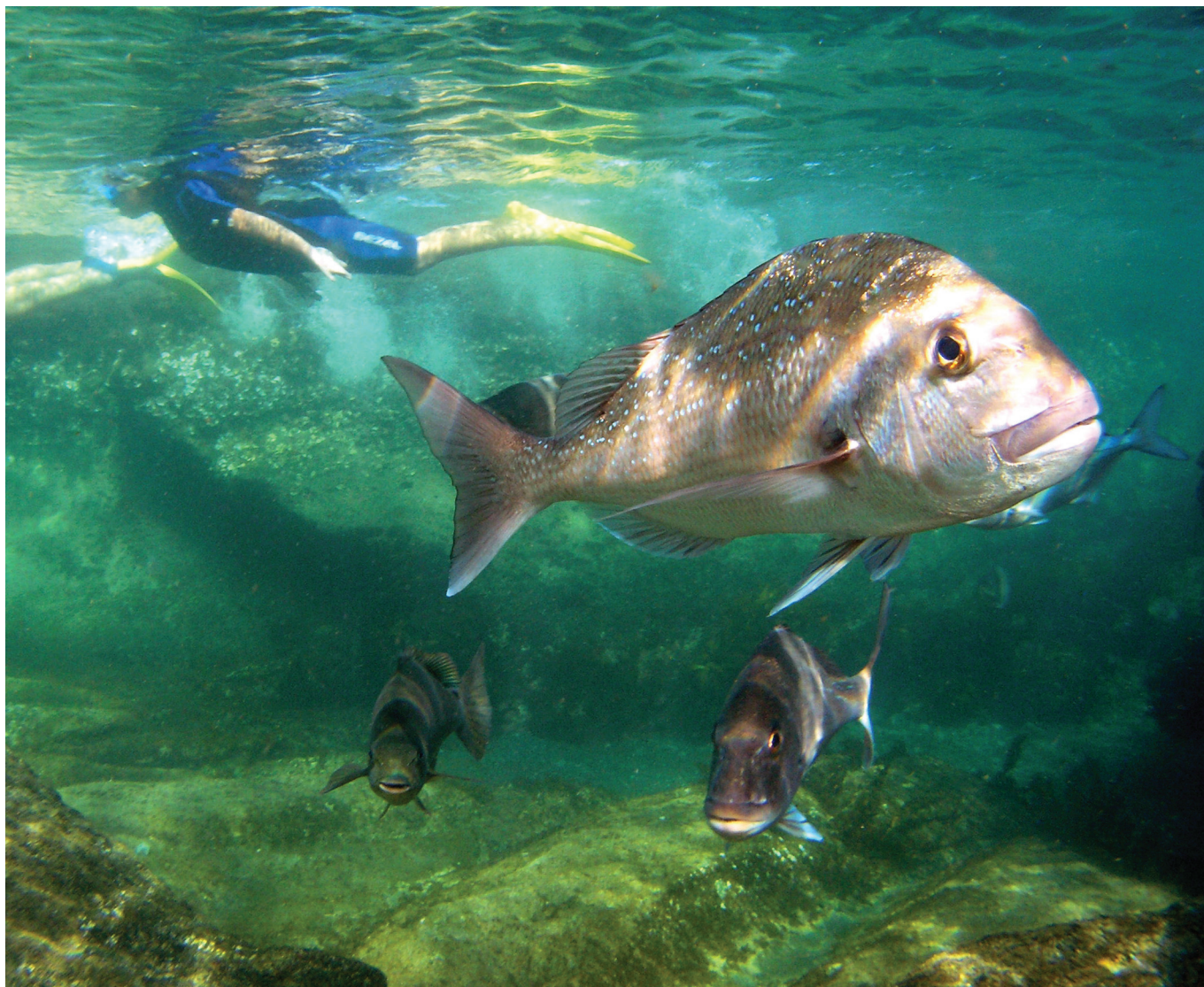
Although the marine reserves in the survey cover only 2% of the coastline, they contain marine ecosystems that are not found in the remaining 98% of coastline (mostly because these areas generally lack large fish). Many of the marine species recorded at the Kermadec Islands were uncommon or absent from other south Pacific locations.

“

I loved being part of Reef Life Survey as I got to work with great people and visited some amazing places. It's also very satisfying to know that the high quality data we collected will be published in top journals and used to its full potential.”



Dr Anna Berthelsen, Marine Scientist, Cawthron Institute



Snapper at Cape Rodney–Okakari Point Marine Reserve. The survey found an average of 40 times more snapper by weight inside marine reserves than in fished areas (2,740 grams v. 70 grams in 500 square metres).

Protected ecosystems

Four large fish species (snapper, stingray, pōrae/trumpeter and blue cod) were bigger and more abundant in all the marine reserves than in the unprotected areas. Particularly large numbers of these fish were recorded in the Kermadec Islands and Te Paepae o Aotea (Volkner Rocks) Marine Reserves.

Marine reserves in New Zealand

New Zealand's first marine reserve, Cape Rodney–Okakari Point Marine Reserve, was established in 1975. In 2015, 0.4% of New Zealand's territorial sea (the strip of water extending 22.2 km from shore) was protected in 44 marine reserves.

Marine reserves:

- preserve representative examples of local marine life
- protect special places
- are important for scientific research
- provide opportunities for learning and recreation.



Before the Cape Rodney–Okakari Point Marine Reserve was created, the absence of large fish and rock lobster allowed kina (their prey) to flourish, which reduced the amount of kelp forest habitat. These changes have gradually reversed since the marine reserve was formed.

Photo: K. Westerskov

Kermadec Islands Marine Reserve

The marine reserve around the Kermadec Islands was identified as one of the four most effective marine protected areas worldwide because it is old, large, no-take, enforced and isolated. More sharks were seen here during the survey than in any other surveyed region worldwide. This area was New Zealand's largest marine reserve in 2015.



Galapagos shark, Kermadec Islands.

What's next?

The Reef Life Survey of northern New Zealand proved to be a useful, low-cost way to assess and compare the biodiversity and ecosystem health of the surveyed sites. It provides a good model for how DOC would like to involve the community in marine monitoring in the future.

Find out more

Read the full publication: Reef Life Survey assessment of biodiversity in Northern New Zealand marine reserves and associated coastlines

www.doc.govt.nz/reef-life-survey-northern-nz

This project is part of the National Marine Reserves Monitoring and Reporting programme, funded by DOC's partnership with Air New Zealand.

We gratefully acknowledge the support of Reef Life Survey in the project.

New Zealand Government

Published by:
Department of Conservation
Marine Ecosystems Team, Science and Policy
PO Box 10420, Wellington 6143, New Zealand
July 2015

Editing and design:
Publishing Team, DOC National Office

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