Counting rock lobsters to monitor ecosystem health

Tender, sweet, succulent rock lobster meat is highly prized. But rock lobsters are more than a delicacy—they are an important component of the rocky ecosystems found around New Zealand's coast.

A count of the number and size of rock lobsters (crayfish, *Jasus edwardsii*) is a simple way to assess the health of an ecosystem. DOC carries out regular counts of rock lobsters in marine reserves and at nearby fished sites to monitor ecosystem health at these sites and find out how well the marine reserves are working.

A 2014 survey in the Leigh/Omaha area found the greatest number of rock lobsters at Tāwharanui Marine Reserve, followed by Cape Rodney-Okakari Point Marine Reserve. Slightly fewer rock lobsters were recorded at both reserves than in the previous 2009 survey. Very low numbers were found in unprotected areas outside the marine reserves, including around Kawau Island.

Study sites

Cape Rodney-Okakari Point and Tāwharanui Marine Reserves.

Department of Conservation
Te Papa Atawhai

Routine monitoring surveys

This was the eighth rock lobster survey at Cape Rodney-Okakari Point Marine Reserve and the second at Tāwharanui Marine Reserve since standardised monitoring was introduced in 2000. Standardised methods allow for direct comparisons between sites around New Zealand.

Monitoring is carried out during the mating season in May and June when rock lobsters come closer to shore. Three shallow and three deep water 500 square metre sites were surveyed at each location. Shallow sites were less than 10 metres deep while deep water sites were 10–20 metres deep.

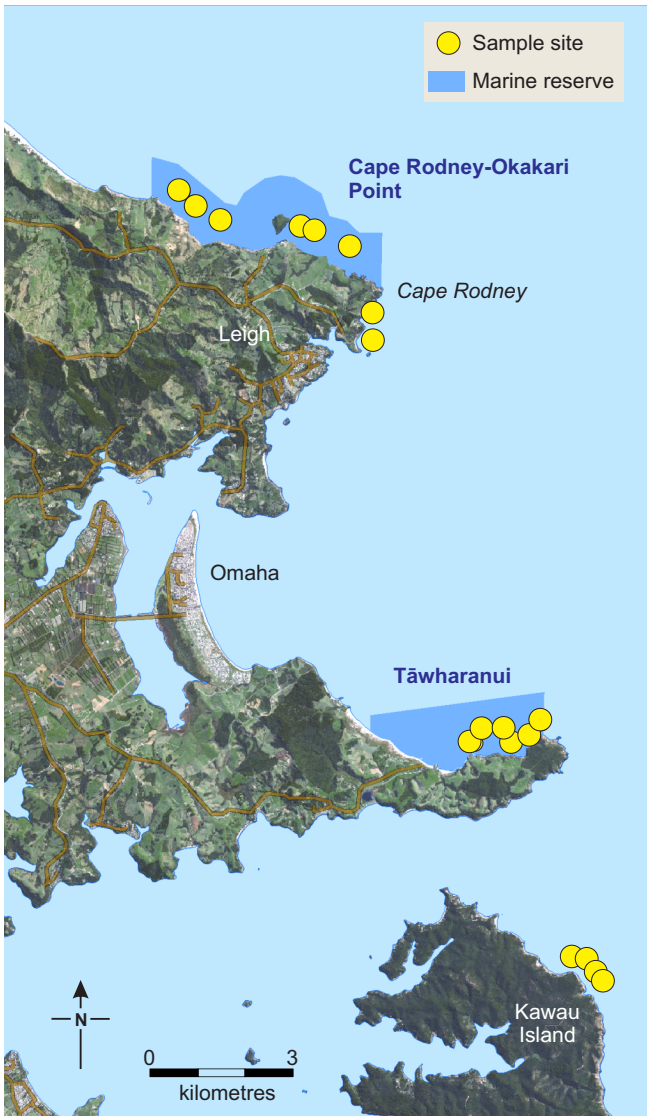
The Cape Rodney-Okakari Point population data is now the longest-running time series recorded for this species in marine reserves worldwide and is a valuable resource for tracking changes into the future.

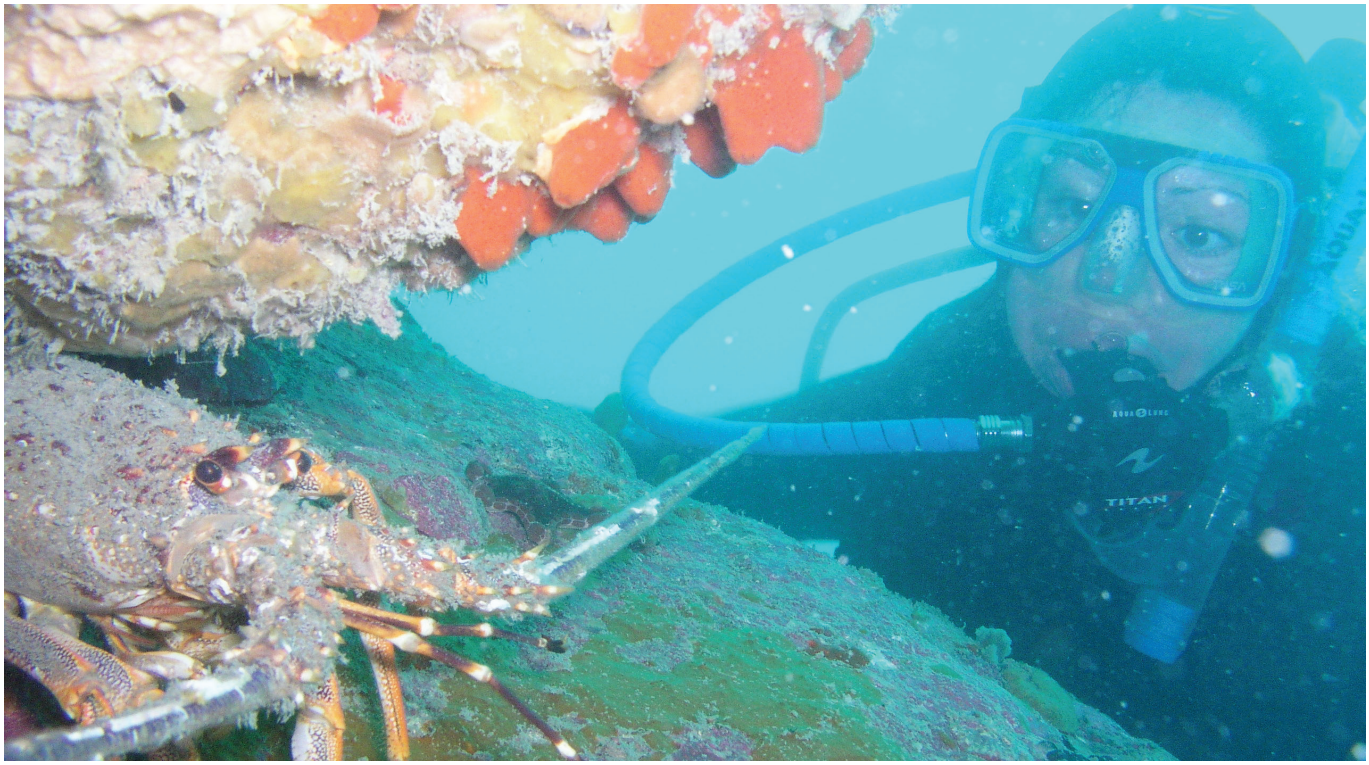
Cape Rodney-Okakari Point Marine Reserve

Also known as Leigh or Goat Island, this was the country's first marine reserve, formed in 1975. The reserve extends 800 metres offshore and protects 547 hectares of coastal waters.

Tāwharanui Marine Reserve

Fishing in this area has been illegal since 1981, when it was established as a marine park. The area became a marine reserve in 2011 and protects an area of 394 hectares. It was New Zealand's 34th marine reserve.





Rock lobster can be hard to spot in their rocky crevice hideouts. *Photo: E. Simmons*

A DOC marine scientist measuring the shell (carapace) width of a rock lobster.

2014 survey results

Average number, total weight and size of rock lobsters at marine reserve and non-reserve sites.

Site	Number per 500 square metres	Estimated weight per 500 square metres (kilograms)	Average shell length (millimetres)*
Cape Rodney-Okakari Point	7.6	7.8	118
Tāwharanui	10.6	5.2	126
Non-reserve sites	1.1	0.2	86

*The legal size for fishing is a tail width of 54 mm for male and 60 mm for female rock lobsters, which equates to a shell length of about 95 mm.

Both marine reserves continue to successfully protect the rock lobsters within their boundaries, with more and larger rock lobsters found at these locations than at non-reserve sites.

The size of rock lobsters outside the marine reserve areas has been consistently low since DOC began monitoring in 2000. The number of legal-sized rock lobsters has also declined at most non-reserve sites around Leigh.

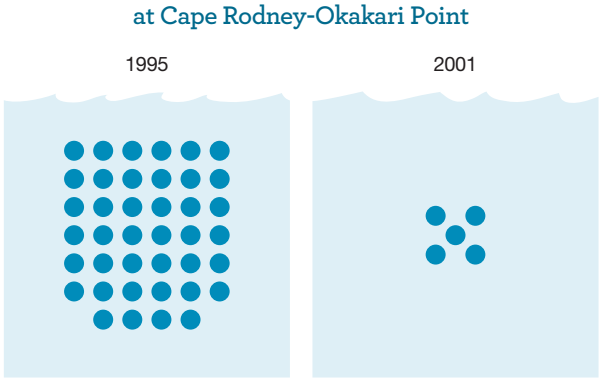
What happened between 1995 and 2001?

The highest number of rock lobsters ever recorded at Cape Rodney-Okakari Point was 40 per 500 square metres in 1995. This figure plummeted to 5 in 2001. A similar decrease was seen at sites outside the marine reserve.

Consistent fishing close to the boundaries of this relatively small marine reserve has been suggested as contributing to the decline but other factors are also likely.

Rock lobster numbers recovered to an average of 10–15 per 500 square metres in 2004, 2006 and 2009 and declined slightly to 8 in 2014.

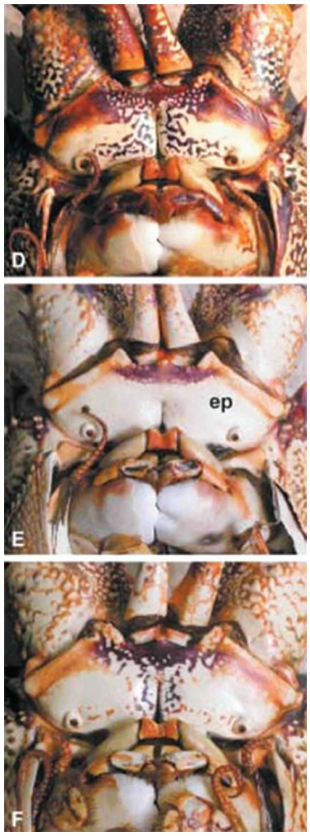
Number of rock lobsters recorded at Cape Rodney-Okakari Point



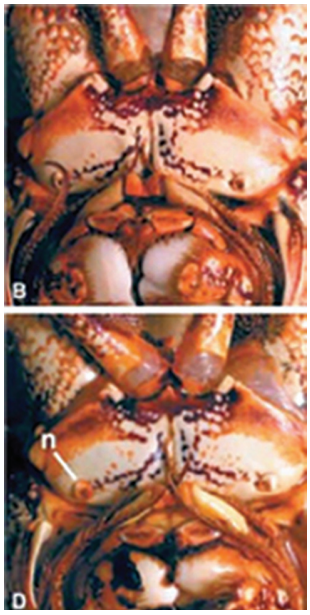
Beauty spots

Recent New Zealand research confirmed that each rock lobster has a unique pattern of spots near the base of its antennae. The spots (and the number and position of up to 6 small spines in the same area), can be used to distinguish each rock lobster without capturing it. The spots and spines were almost identical before and after the rock lobsters had moulted.

Being able to identify individual rock lobsters in this way will enable scientists to find out if catching and tagging other rock lobsters for tracking experiments has a negative effect on them.



Three rock lobsters with different spot patterns.



Before and after: spot patterns stay the same after moulting.

Facts about rock lobsters

- Commonly known as crayfish, but also called kōura, red rock lobsters and spiny lobsters
- Must moult and grow a new shell regularly (rock lobsters with soft shells cannot be gathered)
- Have complex social systems and sometimes congregate in large piles on the seafloor
- Have strong homing behaviour—can navigate to a particular rock from several kilometres away using smell, sound and an internal compass
- Found around New Zealand's coastline and in southern Australia

What's next?

Ongoing rock lobster monitoring is an important part of DOC's marine reserve management. DOC's marine scientists are also interested in researching the rock lobster's favoured habitats in more detail to find out which areas could benefit from marine protection and to help understand the trends observed in previous monitoring.

Find out more

Read the full publication: Cape Rodney to Okakari Point Marine Reserve and Tāwharanui Marine Reserve lobster (*Jasus edwardsii*) monitoring programme: 2014 survey

www.doc.govt.nz/rock-lobster-survey-leigh

Conservation of unique patterns of body markings at ecdysis enables identification of individual spiny lobster, *Jasus edwardsii*.

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