

The logo for NABIS (New Zealand Aquatic Biodiversity Information System) features the word "NABIS" in a bold, blue, sans-serif font. To the right of the text is a stylized map of New Zealand with a magnifying glass over it, symbolizing search and discovery.

To view this as a map and many more go to:

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Type the map name into: *Search for a map layer or place*

Lineage – Scientific Methodology

Annual distribution of virgin paua

1. Electronic databases were used to generate initial maps and summary tables of species distributions.

- a. NIWA Invertebrate Collection (NIC): **specify** database. All records were extracted on 7 November 2006. Data were used to create draft maps of the species distribution.

2009 update: Catch-effort and landings data, the observer database (**cod**), and the **trawl** database were re-examined for the period 31 August 2006 to 13 May 2009. One new record of virgin paua was found in the **landings** data, but this is likely to be a typographic error as this species is not harvested commercially. There are no records available which extend the range previously described for this species.

2011 update: Catch-effort and landings data, the observer database (**cod**), the NIWA invertebrate database (**specify**), and the **trawl** database were re-examined for the period 1 January 2009 to 16 May 2011. No new records were found in these databases. A google search was also done using the species name followed by the word 'distribution' and then the species name followed by the word 'new record'. This did not reveal any records which altered the previous distribution. Discussion with Keith Michael NIWA, Wellington, did not reveal any changes in the distribution of this species.

2. Literature sources were searched for distributional information that added to the distributional ranges determined from databases.
 - a. Aquatic Sciences and Fisheries Abstracts.
 - b. *New Zealand Professional Fisherman* and *Seafood New Zealand* for 1986–2006.
 - c. *New Zealand Fishing News* for 1998–2006.
 - d. Scientific papers, unpublished reports, species monographs, and university theses available to the expert who prepared the distributional layers.
 - e. Other online sources such as OBIS, Fishbase, Google, and the ISI Web of knowledge.

3. Other sources. Observations recorded on data sheets during research diver surveys to estimate the relative abundance of paua (*Haliotis iris*).

4. Summary

- a. Maps and summary tables generated from the electronic databases were provided to an expert scientist who integrated this information with other information from the literature, and expert opinion, and produced hand-drawn distributional zones on a template map showing the coastline and containing depth contours at 250 m, 500 m, and 1000 m. These maps were then digitised and imported into a GIS software package as layers. The areas of the zones were calculated, and the layers were linked to attribute and metadata files.
- b. The primary sources of distributional data for virgin paua were publications in the primary literature as listed below.
- c. *Haliotis virginea* is found throughout New Zealand and at Stewart Island, Campbell Island, the Auckland Islands, Bounty Island, and at the Chatham Islands. No abundance hotspots are known.
- d. Usually found under small boulders between 0 and 27 m. They are herbivores who graze algae with their ribbon-like tongue or radula. Four regional sub species are recognised by Powell (1979). These are *H. virginea crispata*, *H. virginea virginea*, *H. virginea huttoni*, and *H.s virginea morioria*, which are respectively found in the upper North Island, the southern part of the North Island and in the South Island, the Campbell and Auckland Islands, and the Chatham Islands. The four subspecies differ morphologically, possibly because of the environmental conditions associated with their location. There are conflicting opinions as to whether the separation into four subspecies is valid, however, in the absence of hard data to support either hypothesis, Geiger (1998) maintains the subspecies on the basis that they are widely used. The distribution provided here treats all subspecies as *H. virginea*.
- e. *Haliotis virginea* is not fished commercially. The numerous records of this species in MFish catch effort and landings databases are likely to be due to confusion between the three-letter codes PAV (*H. virginea*) and PAU (*H. iris*).

5. References

The following sources provided useful information on the distribution of this species. This is not an exhaustive list of all references to the species.

ABMAP: The Abalone Mapping Project (<http://www.vetigastropoda.com/ABMAP/NZ.html>)

Geiger, D.L. (1998). Recent genera and species of the family Haliotidae Rafinesque, 1815 (Gastropoda: Vestigastropoda. *The Nautilus* 111: 85-116.

Powell, A.W.B. (1979): *New Zealand Mollusca: Marine, Land and Freshwater Shells*. Collins, Auckland. 500 Pp.

Morton, J.E.; Millar, M.C. (1968): *The New Zealand Sea Shore*. Collins, London, 653 pp.