

Lineage

Annual Distribution of Cockle

1. Literature sources

The literature was searched for distributional information on adults of the cockle, *Austrovenus stutchburyi* (Wood, 1828). Generic texts on the ecology and species of the New Zealand seashore (eg., Morton & Miller 1968, Powell 1979), and more recent taxonomic descriptions of venerids (Spencer et al. 2002) show that cockles are found patchily, sometimes in great numbers, around mainland New Zealand and Stewart Island, and at the Chatham and Auckland Islands. *A. stutchburyi* is often abundant on intertidal mud and sand flats, from the lowest high water neap mark to the lowest part of the shore.

- a. Using the keywords **austrovenus or stutchburyi**, extracts were made from Aquatic Sciences and Fisheries Abstracts (all records at 27 July 2003). Using the keywords **austrovenus or a stutchburyi or cockle**, extracts were made from NIWAcat (all records at 27 July 2003). Using the keyword **austrovenus**, extracts were made from Google (all records, 20 October 2003). Relevant publications were obtained but none was useful in extending the distribution of the species beyond that described above.
- b. Using subject indices for 1986–2002, *Seafood New Zealand* was checked for articles dealing with cockle distribution and research. None was useful in extending the distribution of the species beyond that described above.
- c. *New Zealand Fishing News*, 1998–2002 inclusive, was checked for articles dealing with cockle to help estimate presence/absence. None was useful in extending the distribution of the species beyond that described above.
- d. Using the keywords (anywhere or global) **austrovenus and thesis or cockle and thesis** (The University of Auckland, Auckland University of Technology, The University of Waikato, Massey University, Victoria University of Wellington, University of Canterbury, and University of Otago), library catalogues were checked between 7 July and 12 August 2003, and relevant theses obtained and examined. None was useful in extending the distribution of the species beyond that described above, but some provided more detailed local distribution and abundance information.

2. Ministry of Fisheries electronic databases

- a. Mean estimated annual **CELR** database catches for the period 1 October 1989 to 30 June 2003 (extracted in mid 2003) were plotted

by statistical area. All significant (> 1 t) reported landings were made from Statistical areas 003 (Bay of Islands to Whangarei, which includes the Snake Bank COC 1A fishery), 038 (Tasman and Golden Bays, which is part of the COC 7A/7B Nelson/Marlborough fishery), and 024 (Otago Peninsula and surrounds, which includes the Otago Peninsula COC 3 fishery). Otherwise small commercial landings were reported along the east coast, from North Cape south to Hawkes Bay and Motunau to Otago; the west coast from Wanganui to northern Fiordland; and through Foveaux Strait and around Stewart Island. Reports of landings in the offshore Statistical areas 001, 021, 023, 028, and 048 were not accurately reported. Reported catches on the **CLR** database were not examined because the fishery areas, being so large, were not considered useful.

- b. The recreational fishing database **rec_data** was examined on 18 August 2003. The **recDiary** database contained almost 500 records, from throughout New Zealand. In the **recRamp** database there were just under 100 entries, most from the North Region Shellfish Harvest Survey. Together these databases indicate that cockles are recreationally harvested throughout much of the country. It is the national surveys that provide the best indication of relative abundance of cockles. In analyses of the 1996 and 1999/2000 National Marine Recreational Fishing Surveys, Bradford (1998) and Boyd & Reilly (2003) reported *A. stutchburyi* from QMA 1 to be 46.5% and 33.1% respectively of total estimated harvests, QMA 2 at 2.5% and 7.7%, QMA 3 at 11.8% and 20.8%, QMA 5 at 6.0% and 0.3%, QMA 7 at 26.5% and 7.0%, QMA 8 at 2.9% and 0.1%, and QMA 9 at 4.0% and 30.9%. In summary, recreational catches of cockle have been highest in the north of the North Island, and north and east of the South Island.

No other Ministry of Fisheries databases were checked because none was thought to contain any useful information on the distribution of cockle.

3. Museum holdings

Holdings of *A. stutchburyi* in the following museums were examined. Other museum holdings were not investigated because it was considered that they would not add anything to the record. Data were used to help estimate presence/absence.

- a. NIWA Greta Point. The **AllSeaBio** database was examined for records on 23 July 2003, with no live *A. stutchburyi* being taken from beyond the North, South, and Stewart Islands. Records from deep water well west of Cape Egmont were not live cockles. Additions made to the collection since about 1995 have not been loaded onto this database; in a search on 23 October 2003, none of the live-caught *A. stutchburyi* identified to species level and shelved were taken from beyond the North, South, or Stewart Islands.

- b. Museum of New Zealand Te Papa Tongarewa records of this species based on voucher specimens held in their collection have not yet been entered into the **Te Kahui** database. However, this layer was certified by Bruce Marshall, Collection Manager Molluscs, Museum of New Zealand Te Papa Tongarewa.

Summary

The cockle *A. stutchburyi* is an endemic species, adults of which are found around the North, South, and Stewart Islands, and at the Chatham and Auckland Islands, mainly on protected beaches and enclosed shores. They are patchily abundant in many places. Maturity appears to be primarily a function of size rather than age, occurring at about 18 mm SL (Larcombe 1971, Cryer 1997), compared with the minimum exploited size of about 30 mm SL in commercial and non-commercial fisheries. Since there is positive correlation between shell size and period of immersion in a number of localities, from Whangateau to Otago Harbours (Larcombe 1971), the greatest proportion of adults live on lower parts of the shore. There is also often a gradient in size in enclosed waters, cockles often being small at the harbour entrance, large in the basin, and progressively decreasing in size up the estuary (Grace 1966). Thus the areas that appear most important to spawning populations are those near low tide level, within harbour basins. Seasonal distributions of adult *A. stutchburyi* are the same as this annual one.

Most of the information on the distribution and abundance of *A. stutchburyi* is general in nature. It is most common in northern parts of the North Island, where there are many sheltered beaches and estuaries, but other hotspots include the extensive sheltered waters of the north of the South Island and Otago Peninsula. The 100% distribution takes in Stewart Island. Because of the conspicuous low intertidal beach habitat of this species, its absence from rocky offshore islands such as the Three Kings Islands and the Poor Knights Islands, and from the subantarctic islands apart from the Auckland Islands, is strongly indicated. It is not found at the Kermadec Islands (Brook & Marshall 1998).

The above information on the distribution of *A. stutchburyi*, derived mostly from fishery records, general accounts in the literature, and museum collections was reviewed by Mr Bruce Marshall and then integrated by hand onto a large-scale map of New Zealand. The rounded lines were then digitised and imported into a GIS software package as layers. The areas of each distribution class were calculated and the layers were linked to attribute and metadata files. The map, because of its scale, cannot be taken to accurately define the local distribution of this species.

4. References. The following publications were the key references and/or the ones most useful in describing the recent/current annual distribution of the cockle, *A. stutchburyi*. The list is not an exhaustive bibliography of publications about this species.

- Boyd, R.O.; Reilly, J.L. (2003). 1999/2000 National Marine Recreational Fishing Survey: harvest estimates. <http://www.option4.co.nz/documents/2000est.pdf>.
- Bradford, E. (1998). Harvest estimates from the 1996 national marine recreational surveys. *New Zealand Fisheries Assessment Research Document 98/16*.
- Brook, F.J.; Marshall, B.A. (1998). Appendix: Checklist of benthic coastal marine chitons, bivalves, gastropods and cephalopods of the northern Kermadec Islands. *In*: Brook, F.J. The coastal molluscan fauna of the northern Kermadec Islands, Southwest Pacific Ocean. *Journal of The Royal Society of New Zealand* 28: 185–233.
- Cryer, M. (1997). Assessment of cockles on Snake Bank, Whangarei Harbour, for 1996. *New Zealand Fisheries Assessment Research Document 97/2*. (Draft report held in NIWA Greta Point library, Wellington.)
- Grace, R.V. (1966). The bottom communities of the entrance to Whangateau Harbour. *Tane* 12: 6370.
- Larcombe, M.F. (1971) The ecology, population dynamics, and energetics of some soft shore molluscs. Unpublished PhD thesis, The University of Auckland.
- Morton, J.; Miller, M. (1968). The New Zealand sea shore. Collins Auckland.
- Powell, A.W.B. (1979). New Zealand mollusca. Marine, land and freshwater shells. Collins Auckland.
- Spencer, H.G.; Willan, R.C.; Marshall, B.A.; Murray, T.J. (2002). Checklist of the Recent Mollusca described from the New Zealand Exclusive Economic Zone. <http://toroa.otago.ac.nz/pubs/spencer/Molluscs/index.html>

2007 Update.

A Google search (*Austrovenus stutchburyi*) on 6 September 2007, and searches of Seafood New Zealand (September 2005 to August 2007) and New Zealand Fishing News for 2006, did not yield any information that extended or altered the above distributions.

An examination on 17 September 2007 of the **specify** database of the NIWA National Invertebrate Collection for any new (post-July 2005) collections and any new (post-July 2005) identifications of old material did not lead to any extension or change to the distribution map. Similarly, there have been no further, formally identified shelveings of material in the Te Papa collections that extended or altered the distribution (Bruce Marshall, Curator of Molluscs, Museum of New Zealand Te Papa Tongarewa, pers. comm.).

The above was discussed with Mr Bruce Marshall on 18 September 2007. It was agreed that the current distribution map remains the best understanding of the distribution of this species. Note, however, that because of its scale the

distribution map cannot be taken to accurately define the local distribution of this species.

2010 Update.

A Google search (***Austrovenus stutchburyi***) on 6 September 2010, and searches of Seafood New Zealand (September 2007 to September 2010) and New Zealand Fishing News for 2009, did not yield any information that extended or altered the above distributions.

An examination on 12 October 2010 of the **specify** database of the NIWA National Invertebrate Collection for any new (post-August 2007) collections and any new (post-August 2007) identifications of old material, as well as catch effort data from the Ministry of Fisheries (1 August 2007 to 19 October 2010, Rep Log 7940) did not lead to any extension or change to the distribution map. Note, however, that because of its scale the distribution map cannot be taken to accurately define the local distribution of this species.