

## Lineage

### Annual Distribution of Dredge Oyster

#### 1. Literature sources

The literature was searched for distributional information on the adults of the dredge oyster, *Ostrea chilensis* Philippi in Küster, 1844. Dredge oysters are found around mainland New Zealand, Stewart Island, and the Chatham Islands (Powell 1979, Jeffs & Creese 1996). They are found from low water to about 200 m on mud, sand, gravel, or broken-shell bottom, but also attach to rocks and wharf-piles. Size at breeding varies geographically, from about 30 mm to 50 mm shell diameter (Jeffs et al. 1997, Annala et al. 2003).

- a. Using the keywords **ostrea lutaria or o lutaria, ostrea chilensis or o chilensis, tiostrea or t chilensis**, and **tiostrea lutaria or t lutaria**, extracts were made from Aquatic Sciences and Fisheries Abstracts (all records at 27 July 2003). Using the keywords **tiostrea or Ostrea lutaria or chilensis**, extracts were made from NIWAcat (all records at 27 July 2003). Using the keywords **ostrea chilensis**, extracts were made from Google (all pages from New Zealand records, 27 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 dredge oyster 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 dredge oyster 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) **oyster and thesis or tiostrea and thesis** (The University of Auckland, Auckland University of Technology, The University of Waikato, Massey University, and Victoria University of Wellington, and University of Otago), and **oyster and thesis or tiostrea and thesis or ostrea and thesis** (University of Canterbury), 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.

#### 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. There were significant (> 1 t) reported catches from the oyster, scallop, and general statistical areas. Highest reported catches were from oyster statistical areas in Foveaux Strait (OYS 5). High oyster catches were also reported in scallop statistical areas in Tasman and Golden Bays (OYS 7) and at the Chatham Islands; and the general statistical areas in inner parts of the Hauraki Gulf, Tasman and Golden Bays, and Foveaux Strait. Otherwise small commercial catches were reported from around much of the coast of mainland New Zealand. Reports of small catches from offshore statistical areas 001 and 205-206 are doubtful because of their depths.

- b. The recreational fishing database **rec\_data** was examined on 18 August 2003. The **recDiary** database contained almost 200 records, all from central and southern New Zealand (Tasman and Golden Bays, Otago, and Stewart Island). In the **recRamp** database there were a little over 100 entries, all from the 1996 National Marine Recreational Fishing Survey, with most from Tasman and Golden Bays and Marlborough, and a few records (probably oyster identification errors) from the Bay of Islands and Kaipara Harbour. Together these databases show that dredge oysters are recreationally harvested almost exclusively in the South Island, particularly in Tasman and Golden Bays, Otago, and near Stewart Island. It is the national surveys that provide the best indication of relative abundance of dredge oysters, but the 1999/2000 one deals with *O. chilensis* only in OYS 5 (Foveaux Strait) and OYS 7 (Nelson/Marlborough), the two commercial areas (Boyd & Reilly 2003). In her analysis of the 1996 National Marine Recreational Fishing Survey, Bradford (1998) reported *O. chilensis* being harvested in QMA 3 (east coast South Island Clarence River to Slope Point – 17.0% of total estimated harvests), QMA 5 (southern South Island Awarua Point to Slope Point – 32.1%), and QMA 7 (north and west South Island, Awarua Point to Clarence River – 50.9%). In summary, recreational catches of dredge oyster have been highest in the north, southeast, and south of the South Island.
- c. Research bottom trawl records: **trawl** database. All records from 10 February 1979 to 22 January 1997 were extracted on 18 July 1997 and used to estimate presence and absence. Most records were from Tasman and Golden Bays, with others off the south Wairarapa and south Canterbury coasts.
- d. Scientific observer records from larger vessels: **obs** database. Positions of all tows catching *O. chilensis* were used to help estimate presence and absence. Records were from 17 February 1990 to 23 April 2003, and all were from south Canterbury.

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

### 3. Museum holdings

Holdings of *O. chilensis* 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 *O. chilensis* being taken from beyond the North, South, or Stewart Islands. Records from deep water well southwest of Cape Egmont and Kahurangi, and on the Mernoo Bank, were not live oysters (as far as could be determined). Additions made to the collection since about 1995 have not been loaded onto this database; in a search on 1 November 2003, none of the live-caught *O. chilensis* 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 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. The main extension to the above distribution was live dredge oysters from the Mernoo Bank.

### Summary

The dredge oyster *O. chilensis* is endemic to New Zealand and Chile. (The species has also been introduced to Menai Strait in North Wales - Richardson et al. 1993). In New Zealand, adults are found around the North, South, and Stewart Islands and at the Chatham Islands. They also occur on the Mernoo Bank. *O. chilensis* lives mainly on generally soft substrates from 0–200 m (the much greater depths for this species – to over 500 m – reported by Jeffs & Creese (1996) have not been confirmed as living oysters.) Although size at maturity varies a lot geographically, adults co-occur with juveniles and no stocks appear to contain only juveniles. The overall distribution of this oyster is therefore the same as the distribution of the adults. Because they are sessile, seasonal distributions of adult *O. chilensis* are the same as this annual one.

Most of the information on the distribution and abundance of *O. chilensis* is general in nature, the distributional layers being based mainly on the Ministry of Fisheries databases. It is most abundant in northern parts of the South Island and in Foveaux Strait, where it is the basis of important commercial fisheries. It is most unlikely to be present at the Three Kings Islands or Poor Knights Islands. It is unknown if it lives off several stretches of both the North and South Islands because in some areas there has not been appropriate sampling, and in others there is concern that *Ostrea* oysters reported were actually *O. aupaupou*. *O. chilensis* is not

known from the subantarctic islands, nor from the Kermadecs (Brook & Marshall 1998).

The above information on the distribution of *O. chilensis*, 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 dredge oyster, *O. chilensis*. The list is not an exhaustive bibliography of publications about this species.

- Annala, J.H.; Sullivan, K.J.; O'Brien, C.J.; Smith, N.W.McL.; Grayling, S.M. (2003). Report from the Fishery Assessment Plenary, May 2003: stock assessments and yield estimates. Ministry of Fisheries.
- 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.
- Jeffs, A.G.; Creese, R.G. (1996). Overview and bibliography of research on the Chilean oyster *Tiostrea chilensis* (Philippi, 1845) from New Zealand waters. *Journal of Shellfish Research* 15: 305–311.
- Jeffs, A.G.; Hooker, S.H.; Creese, R.G. (1997). Variability in life history characters of the Chilean oyster *Tiostrea chilensis* (Philippi, 1845). *New Zealand Journal of Marine and Freshwater Research* 31: 487–495.
- Powell, A.W.B. (1979). New Zealand mollusca. Marine, land and freshwater shells. Collins Auckland.
- Richardson, C.A.; Seed, R.; Al-Roumaihi, E.M.H.; McDonald, L. (1993). Distribution, shell growth and predation of the New Zealand oyster, *Tiostrea* (= *Ostrea*) *lutaria* Hutton, in the Menai Strait, North Wales. *Journal of Shellfish Research* 12: 207–214.

2007 Update.

A Google search (***Ostrea chilensis***) 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 shelvings 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 Bruce Marshall on 18 September 2007. The current distribution map remains the best understanding of the distribution of this species. However, because of its scale, this map cannot be taken to accurately define the local distribution of this species. It remains unknown if dredge oysters live off several stretches of both the North and South Islands because there has not been appropriate sampling there.

2010 Update.

A Google search (***Ostrea chilensis***) on 6 September 2010, and searches of Seafood New Zealand (September 2007 to September 2010) and New Zealand Fishing News (October 2009 to October 2010), 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.

The above was discussed with Keith Michael (NIWA) on 21 October 2010. The current distribution map remains the best understanding of the distribution of this species. However, because of its scale, this map cannot be taken to accurately define the local distribution of this species. It remains unknown if dredge oysters live off several stretches of both the North and South Islands because there has not been appropriate sampling there.