



Lineage

Annual distribution of brill

FD0510_1; FD0511_1; FD0512_1; FD0513_1; FD0514_1

1. Electronic databases were used to generate initial maps of species distribution.
 - a. Commercial fishing returns (larger vessels): **TCEPR** database. All records from 1 October 1989 to 30 September 2005 were extracted on 17 October 2005. Data were used to estimate mean annual catch and catch rate (kilograms per kilometre towed) in 0.25 degree rectangles. Only the top five species caught are reported on these forms so information on the absence of a species is not available. Records of brill from depths greater than 150 m are probable mis-identifications or mis-codings and were ignored (brill have never been recorded from these depths in research trawl tows).
 - b. Commercial fishing returns (smaller vessels): **CELR** database. All records from 1 October 1989 to 30 June 2003 were extracted on 15–17 July 2003. Data were used to estimate mean annual catch in statistical areas. Information from statistical areas 1–10 was down-weighted because of likely mis-recording of Fishstock instead of statistical area. Only the top five species caught are reported on these forms so information on the absence of a species is not available. Records of brill from around Campbell Island are probable mis-identifications or mis-codings and were ignored. Brill have never been recorded from the Campbell Plateau in research trawl tows, although research surveys have not been conducted in depths less than 200 m around the island.
 - c. Scientific observer records from larger vessels: **obs** database. All records from 1 March 1990 to 30 September 2005 and stored in the new data format were extracted on 20 October 2005. Data were used to estimate mean annual catch and catch rate (kilograms per kilometre towed), and proportion of tows that caught the species, in 0.25 degree rectangles. Records of brill from depths greater than 150 m are probable mis-identifications or mis-codings and were ignored (brill have never been recorded from these depths in research trawl tows).
 - d. Research bottom trawl records: **fish_comm** database. This database is a groomed version of the research trawl database **trawl**. All records from 2 September 1978 to 30 September 2005 were extracted on 19 May 2006. Data were used to estimate total catch, proportion of tows that caught the species, and catch rate (kilograms per kilometre towed) in 0.25 degree rectangles.
 - e. Russian research bottom trawl records: **trawl** database. These data are a subset of the research trawl database **trawl**. All records were extracted on 9 August 2003. Data were used to determine the

presence of this species north of 37 °S. Because the data are old (the most recent record was 1987), and there are problems with species identifications, these data were given low weighting.

- f. Museum of New Zealand Te Papa records of this species based on voucher specimens held in their collection were searched for distributional information that added to the distributional ranges determined from other databases.
 - g. Databases of commercial tuna longline catches (**TLCER**), observer records from tuna longlines (**l_line**), recreational fishing (**rec_data**), and aerial sightings (**aer_sight**) were not used as they contained no records of this species, or the number of records was too small to provide useful additional distributional information.
2. Literature sources were searched for distributional information that added to the distributional ranges determined from databases.
 - a. Unpublished electronic bibliography of New Zealand fishes compiled by L. J. Paul and held on a NIWA computer.
 - b. Aquatic Sciences and Fisheries Abstracts.
 - c. *New Zealand Professional Fisherman* and *Seafood New Zealand* for 1986–2002.
 - d. *New Zealand Fishing News* for 1998–2002.
 - e. Scientific papers, unpublished reports and university theses available to the expert who prepared the distributional layers.
3. Other sources.
 - a. Nil.
4. Summary
 - a. Maps 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 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 brill were the CELR, TCEPR, and fish_comm databases.
 - c. Brill are endemic to New Zealand and are found on sand and mud bottoms throughout mainland New Zealand to about 100 m depth (Ayling and Cox 1984, fish_comm data). Brill have also been reported from Petre Bay in the Chatham Islands (Waite 1911, Young 1929, Roberts 1991). Brill have not been reported from much of Fiordland, and there is not likely to be much suitable habitat due to the steep gradient of the continental shelf.
 - d. Brill are not particularly abundant but are most common around the South Island. Hot spots occur around much of the South Island.

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.

Anderson, O.F.; Bagley, N.W.; Hurst, R.J.; Francis, M.P.; Clark, M.R.; McMillan, P.J. (1998). Atlas of New Zealand fish and squid distributions from research bottom trawls. *NIWA Technical Report 42*. 303 p.

Ayling, T.; Cox, G.J. (1984). Collins guide to sea fishes of New Zealand. 343 p. Collins, Auckland.

Francis, M.P. (1979). Checklist of the marine fishes of Kaikoura, New Zealand. *Mauri Ora* 7: 63–71.

Paul, L.J. (2000). New Zealand Fishes. Identification, Natural History and Fisheries. Reed, Auckland. 253 p.

Roberts, C.D. (1991). Fishes of the Chatham Islands, New Zealand: a trawl survey and summary of the ichthyofauna. *New Zealand Journal of Marine and Freshwater Research* 25: 1–19.

Roper, D.S.; Jillett, J.B. (1981). Seasonal occurrence and distribution of flatfish (Pisces: Pleuronectiformes) in inlets and shallow water along the Otago coast. *New Zealand Journal of Marine and Freshwater Research* 15: 1–13.

Waite, E.R. (1911). Scientific results of the New Zealand Government Trawling Expedition, 1907. Pisces. Part II. *Records of the Canterbury Museum* 1: 157–258.

Young, M.W. (1929). Marine fauna of the Chatham Islands. *Transactions and Proceedings of the New Zealand Institute* 60: 136–166.