



Lineage

Annual distribution of greenback flounder

FD0740_1; FD0741_1; FD0742_1; FD0743_1; FD0744_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 greenback flounder from depths greater than 400 m are probable mis-identifications or mis-codings and were ignored (greenback flounder have never been recorded from these depths in research trawl tows). Records of greenback flounder from around the North Island are probable mis-identifications of sand flounder or yellowbelly flounder, or mis-codings and were ignored. Greenback flounder have never been recorded from the North Island in research trawl tows, and only twice from Museum of New Zealand specimens.
 - 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 greenback flounder from around the North Island are probable mis-identifications of sand flounder or yellowbelly flounder, or mis-codings and were ignored. Greenback flounder have never been recorded from the North Island in research trawl tows, and only twice from Museum of New Zealand specimens. Records of greenback flounder from depths greater than about 400 m are probable mis-identifications or mis-codings and were also ignored. Greenback flounder have never been recorded from these depths in research trawl tows.
 - 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.
 - 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. Greenback flounder records from the Firth of Thames, Wellington Harbour, Stewart Island, and Campbell Island added to the distribution shown in other databases.
 - g. Databases of commercial tuna longline catches (**TLCER**), observer records from tuna longlines (**I_line**), recreational catches (**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 greenback flounder were the CELR, TCEPR, obs, and fish_comm databases.

- c. Greenback flounder are found in New Zealand and southern Australia (Ayling and Cox 1984, Kailola et al. 1993, Hutchins and Swainston 1999, Paul 2000).
- d. In New Zealand, all records of greenback flounder are from Cook Strait south, apart from a museum specimen from the Firth of Thames. The known distribution of the species is patchy, and includes Karamea Bight (upper west coast South Island), Tasman and probably Golden Bays, the east coast of the South Island, the Auckland Island shelf and Campbell Rise (Parrott 1958, Manikiam 1969). Greenback flounders are generally found in coastal waters to about 300 m depth, although they have been recorded from deeper water, to about 400 m, particularly on the Auckland Island shelf.
- e. Greenback flounder have been reported from north of the Chatham Islands (observer data), however, this needs confirmation as the literature (Young 1929, Roberts 1991) and research trawl data (fish_comm) do not support this.
- f. There is uncertainty about the distribution of greenback flounder in New Zealand waters due to probable confusion with sand flounder and yellowbelly flounder, and mis-codings in commercial data.
- g. Hotspots of greenback flounder are found on the east coast of the South Island from the Canterbury Bight to Otago Peninsula.

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.

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- Ayling, T.; Cox, G.J. (1984). Collins guide to sea fishes of New Zealand. Collins, Auckland. 343 p.
- Hutchins, B.; Swainston, R. (1999). Sea Fishes of Southern Australia. Gary Allen Pty Ltd, Smithfield, Australia. 180 p.
- Kailola, P.J.; Williams, M.J.; Stewart, P.C.; Reichelt, R.E.; McNee, A.; Grieve, C. (1993). Australian Fisheries Resources. Bureau of Resource Sciences, Department of Primary Industries and Energy, and the Fisheries Research and Development Corporation. Canberra, Australia. 422 p.
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- Parrott, A.W. (1958). Fishes from the Auckland and Campbell Islands. *Records of the Dominion Museum, Wellington 3*: 109–119.
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- 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.
- Young, M.W. (1929). Marine fauna of the Chatham Islands. *Transactions and Proceedings of the New Zealand Institute* 60: 136–166.