

The logo for NABIS (New Zealand Aquaculture Biosecurity 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 icon overlaid on it, symbolizing search and investigation.

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

www.nabis.govt.nz
web mapping tool

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

Lineage – Scientific methodology

Annual distribution of spotted stargazer

1. Electronic databases were used to generate initial maps of species distribution.
 - a. Commercial trawl fishing returns: **TCEPR** and **TCE** forms. All records from 1 October 1989 to 30 September 2008 were extracted on 4 August 2009. Data were used to estimate mean annual catch and catch rate (kilograms per kilometre towed) in 0.25 degree rectangles. Only the top five or eight species respectively are reported on these forms so information on the absence of a species is not available. Records of spotted stargazer (SPZ) from depths greater than 200 m, and records from the Chatham Rise east of Mernoo Bank, Campbell Rise, Stewart-Snares Shelf, Puysegur Bank, and Challenger Plateau are probable mis-identifications or mis-codings of giant stargazer (STA) and were ignored (spotted stargazer has never been recorded from these regions 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 spotted stargazer (species code SPZ) from the Bounty Platform are probable mis-identifications or mis-codings of giant stargazer (STA) and were ignored (spotted stargazer has never been recorded from these regions in research trawl tows).
 - c. Scientific observer records from commercial vessels: **COD** database. All records from 1 April 1986 to 30 September 2008 were extracted on 6 August 2009. 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 spotted stargazer (species code SPZ) from the Southern Plateau, Stewart-Snares Shelf and Chatham Rise are probable mis-identifications or mis-codings of giant stargazer (STA)

and were ignored (spotted stargazer has never been recorded from these regions in research trawl tows).

- d. Research bottom trawl records: **fish_comm** and **trawl** databases. **fish_comm** is a groomed version of **trawl**. All **fish_comm** records from 2 September 1978 to 30 September 2005 were extracted on 19 May 2006. All **trawl** records from 1 October 2005 to 30 September 2008 were extracted on 7 August 2009. 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. Recreational fishing database: **rec_data**. All records were extracted on 24 July 2003. Data were used to determine the presence of a species in a variety of statistical reporting areas.
 - g. 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.
 - h. Databases of commercial tuna longline catches (**TLCER**), observer records from tuna longlines (**I_line**), 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 spotted stargazer were the fish_comm database, and Museum of New Zealand records. There is some doubt about the identification of spotted stargazer in the other databases and much of the reported catch of spotted stargazer in water deeper than 100 m has been ignored.
- c. Hot spots of spotted stargazer occur on the west and east coasts of the northern North Island, Tasman and Golden Bays, and north and south of Banks Peninsula in shallow water (less than 30 m) including estuaries and harbours.
- d. Spotted stargazer is not common and while often found in harbours and estuaries it is also distributed as deep as 150 m on the continental shelf. Little information and literature is available for this species. Distribution is mainly around the North Island and the northern half of the South Island but includes the Chatham Islands. Records from Norfolk Island and the West Norfolk Ridge require verification because of possible confusion with other similar species.
- e. Unknown distribution includes the Mernoo Bank but there are no research tows in shallow water to confirm presence or absence.
- f. Spotted stargazer is endemic to New Zealand.

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.

Francis, M.P. (1996). Geographic distribution of marine reef fishes in the New Zealand region. *New Zealand Journal of Marine and Freshwater Research* 30: 35–55.

Francis, M.P. (2001). Coastal fishes of New Zealand. An identification guide. 103 p. Reed Publishing, Auckland.

Wong, E.K.C. (1975). The biology of the spotted stargazer *Geniagnus monopterygius* (Bloch and Schneider) in Wellington Harbour, New Zealand. Unpublished M.Sc. thesis, Victoria University of Wellington, Wellington.