



## Lineage

### Autumn distribution of spiny dogfish

Autumn, for the purposes of NABIS, is defined as being the months of April, May and June. This definition is based on research regarding the spatial and temporal variability of sea surface temperature in the New Zealand region (Uddstrom and Oien 1999).

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. Furthermore, many fishers discard spiny dogfish, and even if they were in the top five species, they still would not have been reported on the forms. Records of spiny dogfish from north-eastern North Island (North Cape to East Cape) and the Challenger Plateau are probable mis-identifications or mis-codings of northern spiny dogfish, and were ignored (spiny dogfish have never been recorded from these regions in research trawl tows). Records of spiny dogfish from depths greater than 1000 m have been included, although it is probable that the trawl caught these fish in midwater.
  - 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. Only the top five species caught are reported on these forms so information on the absence of a species is not available. Furthermore, many fishers discard spiny dogfish, and even if they were in the top five species they, still would not have been reported on the forms. Records of spiny dogfish from north-eastern North Island (North Cape to East Cape), the Challenger Plateau, and the Kermadec Ridge are probable mis-identifications or mis-codings of northern spiny dogfish, and were ignored (spiny dogfish have never been recorded from these regions 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. Records of spiny dogfish from north-eastern North Island (North Cape to East Cape), the Challenger Plateau, and the Lord Howe and Norfolk ridges are probable mis-

identifications or mis-codings of northern spiny dogfish, and were ignored (spiny dogfish have never been recorded from these regions in research trawl tows). Records of spiny dogfish from depths greater than 1000 m have been included, although it is probable that the trawl caught these fish in midwater.

- 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. This was the main database used to define distributional boundaries.
  - e. Scientific observer records from tuna longline vessels: **I\_line** database. All records between 1 October 1992 and 30 September 2005 were extracted on 9 December 2005. Data were used to estimate catch rate (number per 1000 hooks) in 0.25 degree rectangles. However, the latitudes and longitudes used were for the set start position, and because longline length is often greater than 140 km, the resolution of the data is about 1 degree square. These records showed that spiny dogfish are caught occasionally up to 100 km offshore between Jackson's Bay and Snares Islands, and in the Bounty Trough.
  - 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 aerial sightings (**aer\_sight**) and Russian trawl surveys (**trawl**) were not used, as they contained no records of this species. The database of recreational fishing catches (**rec\_data**) was not used, as it did not 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 source of distributional data for spiny dogfish was the fish\_comm database. Distribution and hotspots on the other databases generally agreed with the fish\_comm database, but at times suffered from problems of mis-identification or mis-coding.
- c. Spiny dogfish has a worldwide distribution (Compagno 1984). They are found on both coasts of the North Atlantic and North Pacific oceans, and around southern South Africa, South America, Australia, and New Zealand. They are found from the intertidal down to depths of at least 900 m. They prefer a temperature range between 7 °C and 15 °C and make migrations to stay within that range.
- d. Spiny dogfish are found south of Cape Maria Van Diemen on the west coast, and East Cape on the east coast, of North Island. Records of spiny dogfish from commercial fishers and observers between North Cape and East Cape, the Challenger Plateau, and the Lord Howe, Norfolk, and Kermadec ridges, are probable mis-identifications or mis-codings of northern spiny dogfish, and were ignored (spiny dogfish have never been recorded from these regions in research trawl tows). Spiny dogfish extend on to the Campbell Plateau and Bounty Plateau (the latter verified by a 2001 trawl survey), but their distribution on the Macquarie Ridge is uncertain.
- e. Observer longline records show that spiny dogfish are caught occasionally up to 100 km offshore between Jackson's Bay and Snares Island and in the Bounty Trough. Spiny dogfish have also been caught occasionally during research trawls over bottom depths greater than 1000 m, although it is probable that these fish were caught in midwater. The wider pelagic distribution of spiny dogfish is unknown.
- f. Hotspots of spiny dogfish abundance in autumn are east and south of Stewart Island, Cook Strait, Canterbury Bight and Banks 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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