

Lineage – Scientific methodology

Annual distribution of spawning blue shark lineage

1. Electronic databases were used to generate initial maps of species distribution.

- a. Scientific observer records from tuna longliners: **I_line** database. All records from 11 June 1989 to 14 August 2004 were extracted on 15 November 2005.

2009 update: An examination of the observer (**I_line**) database was made for the period up to 10 February 2009, but no data were found that would change the previous distribution of spawning blue sharks.

2. Literature sources were searched for usable biological and distributional information to add to the distributional range of spawning blue shark 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- a. Unpublished electronic bibliography of New Zealand fishes compiled by L. J. Paul and held on a NIWA computer.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 1986–2005.
- d. *New Zealand Fishing News* for 1998–2005.
- e. Scientific papers, unpublished reports and university theses available to the expert who prepared the distributional layers.
- f. Other online sources such as Fishbase, Google, and the ISI Web of knowledge.

2009 update: Searches of ASFA, Fishbase, and Google Scholar on 18 May 2009 returned no additional material that would alter the known distribution of spawning blue shark in New Zealand waters.

3. Other sources.
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- b. The primary sources of distributional data for spawning blue shark were the **I_line** database and unpublished data held by NIWA.
- c. Blue sharks occur worldwide in tropical to cool temperate waters, mainly between 50° N and 40° S. In the New Zealand region, blue sharks range as far south as the southern edge of the Stewart Island – Snares Islands Shelf. There are no known records from the Campbell Plateau, but it is possible that the species penetrates that far south because blue sharks reach about 52° S in the central South Pacific Ocean. Blue sharks may be found close to shore in a few metres of water, especially in areas where the continental shelf is narrow, but they are most common in oceanic waters or over the outer half of the continental shelf. The full depth range of blue sharks is unknown, but they range from the surface to at least 350 m.
- d. The locations of blue shark “pupping” areas are unknown, but can be inferred from the locations of pregnant females carrying large embryos, and the locations of new-born young. This information is not very precise because pregnant females may be captured large distances away from pupping grounds, and new-born young may move away from the pupping grounds after birth. Most pregnant females in the New Zealand region have been reported from north of 33 °S, but there are also a number of records from off Fiordland. New-born young shorter than 60 cm fork length occur throughout the New Zealand range of the species. It is likely that female blue sharks give birth mainly in subtropical and tropical waters north of mainland New Zealand, but with some pupping occurring as far south as the Stewart Island – Snares Shelf.

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.