

Lineage

Annual distribution of White pointer shark

1. Electronic databases were used to generate initial maps and summary tables of species distributions.
 - a. Commercial fishing returns: **Catch-effort data**. All records from 01 Oct 1989 to 07 November 2006 were extracted on 9 November 2006. A summary of estimated catches by statistical area was created from these data. Many of these records did not have position information, but those that did were used to create draft maps of species distributions. Information from statistical areas 1–10 was down-weighted because of likely mis-recording of FMA or QMA 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.
 - b. Commercial fishing returns: **Landings data**. All records from 01 Oct 1989 to 07 November 2006 were extracted on 9 November 2006. From this extract a summary of landings by species, year, and fishstock (either the species QMAs or the generic FMAs numbered 1–10) was created.
 - c. Scientific observer records from larger trawlers: **obs** database. All records from 24 August 1989 to 3 October 2006 and stored in the new data format were extracted on 13 November 2006. Data were used to create draft maps of the species distribution, showing also the positions of trawls not catching the species. This database provides an important check against how well observed vessel data matches the larger commercial catch-effort data.
 - d. Scientific observer records from bottom long-liners: **obs_lfs** database. All records from 30 March 1993 to 16 August 2006 were extracted on 13 November 2006. Data were used to create draft maps of the species distribution.
 - e. Scientific observer records from tuna long-liners: **I_line** database. All records from 21 June 1988 to 12 November 2006 were extracted on 22 November 2006. Data were used to create draft maps of the species distribution. 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.

2009 update: Catch-effort and landings data, the observer database (**cod**), and the **trawl** database were re-examined for the period 31 August 2006 to 13 May 2009. Only a few new records of white pointer sharks were found (mainly from catch effort records and **cod**) and all were from within the previously recorded range for the species.

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 1986–2006.
 - d. *New Zealand Fishing News* for 1998–2006.
 - e. Scientific papers, unpublished reports, species monographs, and university theses available to the expert who prepared the distributional layers.
 - f. Other online sources such as OBIS, Fishbase, Google, and the ISI Web of knowledge.
3. Other sources.
 - a. Unpublished records held by M. P. Francis (NIWA) and C. Duffy (Department of Conservation).
 - b. Recent tagging projects at Stewart Island and the Chatham Islands (M.P. Francis, unpublished data).
4. Summary
 - a. Maps and summary tables 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 white pointer sharks were unpublished records and observer data from commercial fishing vessels.
 - c. White pointer sharks (also called great white sharks) occur worldwide, ranging from subantarctic to tropical waters (Last & Stevens 1994; Compagno 2001). Greatest abundances have been reported from cool temperate regions (South Africa, southern Australia, New Zealand, California), with few records from tropical regions. However recent satellite tagging has shown that white pointer sharks regularly visit tropical waters.
 - d. In New Zealand, white pointer sharks range from Campbell Island (record based on an attack on a human) to the tropics. They are found in coastal waters throughout mainland New Zealand and around all offshore islands. They likely occur throughout the greater region: sharks tagged at the Chatham Islands and Stewart Island have travelled to Australia, New Caledonia, southern Vanuatu and the Louisville Seamount Ridge, indicating that they travel large distances and cross ocean basins. Two Australian-tagged sharks have travelled to New Zealand. There are insufficient data available

on the abundance of white pointer sharks to determine seasonal variations in distribution.

- e. Areas of high abundance occur around the Chatham Islands, Otago, Southland and Stewart Island.
- f. White pointer sharks range from the surface to depths of at least 980 m (Bonfil et al. 2005).

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.

Bonfil, R.; Meyer, M.; Scholl, M.C.; Johnson, R.; O'Brien, S.; Oosthuizen, H.; Swanson, S.; Kotze, D.; Paterson, M. (2005). Transoceanic migration, spatial dynamics, and population linkages of white sharks. *Science* 310: 100-103.

Compagno, L.J.V. (2001). Sharks of the world. An annotated and illustrated catalogue of shark species known to date. FAO Species Catalogue for Fishery Purposes 1, vol. 2. 269 p.

Last, P.R.; Stevens, J.D. (1994). Sharks and rays of Australia. CSIRO, Hobart. 513 p.