Lineage

Spring distribution of barracouta

Spring, for the purposes of NABIS, is defined as being the months of October, November and December. 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. Records of barracouta from the eastern Auckland Islands gap and the northern Challenger Plateau are not confirmed by research tows, scientific observers, or the literature, and are treated as possible but unknown.
    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 barracouta from the Kermadecs Ridge are unconfirmed and were ignored.
    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. Tuna longline fishing returns: **TLCER**. All records were extracted on 17 May 2006. Data were used to estimate mean annual catch and catch rate (kilograms per hook) 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. Records of barracouta over deep water to the south-west of New Zealand are confirmed by MFish observers. Records over deeper water off the north-east coast of the North Island are not confirmed by observers and are treated as possible but unknown.

f. Scientific observer records from tuna longline vessels: **l_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.
g. 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 ^{o}S. There were no records of barracouta outside the distributions from other databases.
h. 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. Records of barracouta outside of the distributions from other databases included the Aotea seamount (no depth given) and the Hikurangi Trough (30–45 m depth).
i. Databases of recreational fishing (**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 barracouta were TCEPR, CELR, and fish_comm databases. Tuna longline databases provided additional offshore information. Historical commercial data (Hurst 1988) were used to define a hotspot area off the north-west coast of the North Island.
c. Barracouta occur in coastal and continental temperate waters of the Southern Hemisphere, including off South Africa, southern South America, and southern Australia. In New Zealand they occur throughout mainland waters from the Three Kings Islands to the Auckland Islands, and around the Chatham Islands. The known depth range of barracouta is 0–670 m. They are caught by tuna longlines over seabed depths up to 1800 m, but the lines only fish to about 300 m.
d. Commercial fishing records of barracouta from the eastern Auckland Islands gap, over deeper water off the north-east coast of the North Island and the south-west coast of the South Island have not been confirmed by research surveys, by scientific observers, or from the literature, and they are treated as unknown.
e. Data from TCEPR, CELR, TLCER, obs, and fish_comm databases were examined for seasonal variations in distribution. Other information on seasonal movements has come from tagging (Hurst and Bagley 1989). In spring, the 90% and 100% distributions are the same as the annual distribution except that the occurrence of barracouta at the Auckland Islands, in the Mernoo Gap, and over deeper water off the south-west coast of the South Island is unknown. There are localised hotspots around the South Island and at the Chatham Islands. Those off Southland and the Chatham Islands relate to peak spawning activity in these areas.

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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Uddstrom, M.J.; Oien, N.A. (1999). On the use of high-resolution satellite data to describe the spatial and temporal variability of sea surface temperatures in the New Zealand region. *Journal of Geophysical Research. Oceans 104 C9*: 20729-20751.