Lineage

Annual distribution of Red Gurnard

FD1570_1; FD1571_1; FD1572_1; FD1573_1; FD1574_1

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 red gurnard (species code GUR) from depths greater than 250 m, and on the Chatham Rise east of Mernoo Bank, and on Challenger Plateau are probable mis-identifications or mis-codings and were ignored (red gurnard 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 red gurnard from the Chatham Rise east of Mernoo Bank, the Bounty Platform, Auckland Islands, and Pukaki Rise are probable mis-identifications or mis-codings (red gurnard has 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 red gurnard from depths greater than 250 m, and on the Chatham Rise east of Mernoo Bank, are probable mis-identifications or mis-codings and were ignored (red gurnard has never been recorded from these regions in research trawl tows).
    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. 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. 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 (**l_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 red gurnard were TCEPR, CELR, Obs, and fish_comm databases, and to a lesser extent the Russian trawl database. There were no consistent and meaningful differences in the seasonal distribution of red gurnard compared to the annual distribution. Any possible differences in seasonal distribution are not on a scale that is possible to plot, given the resolution of the data.

c. Red gurnard is found in New Zealand, Australia (Queensland, New South Wales, southern coast and Western Australia), South Africa, Japan, Korea, and China (Last et al. 1983, Ayling & Cox 1984, May & Maxwell 1986). It has also been found at Lord Howe Island (specimen in Australian Museum, Sydney; Allen et al. 1976). Records from the Russian trawl survey and CELR databases indicate that red gurnard also occur at Norfolk Island and the Kermadec Islands; these records are considered reliable, given the Lord Howe record in a similar latitude.
d. Hot spots of red gurnard are found throughout New Zealand from Southland to Northland in depths between about 5 m and 50 m. The known depth range of red gurnard is 0–300 m.

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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