

Lineage – Scientific methodology

Annual distribution of juvenile anchovy lineage

1. An electronic database was used to generate initial maps of species distribution.

- a. Research bottom trawl records: **trawl** database. All records from 1 October 1961 to 5 July 2005 were extracted on 25 August 2005. Data were used to estimate mean annual catch of juveniles, proportion of juveniles in the catch of the species, and proportion of tows that caught juveniles of the species, in 0.25 degree rectangles.

2009 update: A repeat of this extract, for the period 31 Mar 2005 to 1 May 2009, returned no additional length data for anchovy in New Zealand waters.

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- a. Unpublished electronic bibliography of New Zealand fishes compiled by L. J. Paul and held on a NIWA computer.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 1986–2005.
- 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- e. Scientific papers, unpublished reports and university theses available to the expert who prepared the distributional layers.

2009 update: Searches of ASFA, and Google Scholar on 15 May 2009 returned no additional useful material dealing with juveniles of anchovy in New Zealand waters.

3. Other sources.

- a. Nil.

4. Summary

- a. Maps generated from the electronic database 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 juvenile anchovy were **trawl** database supplemented with published records in the scientific literature.
- c. Anchovy occur around most of mainland New Zealand, but are largely – perhaps completely – absent from the South Canterbury, Otago, and Southland coasts (Whitehead et al. 1988, Paul 2000). They are also present around the southern two-thirds of Australia (McNee 1993), and occur at some mid-Tasman Islands (Francis 1993). There are no records from the Chatham Islands. Anchovy are a coastal pelagic species; they usually occur at the surface or in midwater where the water is less than 100 m deep, but are not constrained by seafloor depth.
- d. Larval and juvenile anchovy appear to be found in sheltered bays throughout their range around the New Zealand coast. There appear to be particular hotspots in Tasman and Golden Bays, Hawke Bay, and around the north of the North Island including the Hauraki Gulf, Bay of Plenty, and entire east and west Northland coasts.

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.

Francis, M.P. (1993). Checklist of the coastal fishes of Lord Howe, Norfolk, and Kermadec Islands, Southwest Pacific Ocean. *Pacific Science* 47(2): 136-170.

McNee, A. (1993). Anchovy. pp. 205–206 In Kailola, P.J. et al. (comps), Australian Fisheries Resources. Bureau of Resource Sciences and Fisheries Research and Development Corporation, Canberra.

NIWA (2001). Anchovy. pp. 1–6 In Establishing potential area boundaries and indicative TACs for selected non-QMS species. Report to the Ministry of Fisheries for Project MOF2000/03G.

Paul, L.J. (2000). New Zealand fishes. Identification, natural history & fisheries. Reed Books, Auckland. Revised edition. 253 p.

Robertson, D.A. (1978). Blue mackerel, pilchard, anchovy, sprat, saury, and lanternfish. pp. 85–89 In Habib, G.; Roberts, P.E. (comps.), Proceedings of the Pelagic Fisheries Conference July 1977.

Whitehead, P.J.P.; Nelson, G.J.; Wongratana, T. (1988). Clupeoid fishes of the world (Suborder Clupeiidae). Part 2. Engraulidae. FAO Fisheries Synopsis No. 125, Vol. 7(2): 305-579.