



Lineage – Scientific methodology

Annual distribution of northern royal albatross

1. Literature sources were searched for distribution information.
 - a. Scientific papers, published texts, unpublished reports and university theses available to the expert who prepared the distributional layers.
 - b. Aquatic Sciences and Fisheries Abstracts for 1960-2007.
 - c. *OSNZ News* and *Southern Bird* for 1977–2007.
2. Other sources.
 - a. NZSAS (New Zealand Seabirds at Sea) database maintained by Natural Environment, Museum of New Zealand Te Papa Tongarewa, Wellington.
 - b. A database of daily seabird sightings off Kaikoura, January 1999-October 2007 (www.oceanwings.co.nz).
3. Summary
 - a. An expert scientist integrated information from the literature and expert opinion, and produced hand-drawn distributional zones on a template map. 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 distribution data for northern royal albatross were the NZSAS database, papers published in refereed journals, texts and unpublished reports.
 - c. Insufficient data and the absence of any indication of differences in distribution precluded the production of seasonal distribution maps for northern royal albatross.
 - d. A distribution “hotspot” for New Zealand seabirds is defined as “an area of increased abundance of a species, as considered by the expert compiling the species account”. Typical examples of hotspots include areas around breeding locations during the breeding season, regardless of the absolute size of the breeding

colony, and areas that are consistently and repeatedly favoured as feeding locations.

- e. The northern royal albatross is endemic to New Zealand, breeding only at the Chatham Islands (The Forty-Fours, Big and Little Sister Islands) and Tairaroa Head, Otago Peninsula (Taylor 2000, Robertson *et al.* 2003). This is a biennial breeder and the season extends from November to September for each breeding attempt (Robertson *et al.* 2003).
- f. The northern royal albatross occurs in New Zealand coastal waters and the Tasman Sea throughout the year (Marchant & Higgins 1990, Heather & Robertson 1996). They are most commonly seen in winter, especially in Cook Strait, off East Cape, and in Foveaux Strait (Heather & Robertson 1996), but this contrasts with the frequency of occurrence of sightings off Kaikoura, where they are most frequently reported November-January inclusive (www.oceanwings.co.nz).
- g. The northern royal albatross is a shelf feeder. Satellite tracking of four birds breeding on the Sisters in 1996 showed that 78% of their foraging locations occurred on the outer Chatham Rise (Nicholls *et al.* 2002). Likewise, satellite tracking of birds breeding at Tairaroa Head showed that most foraging occurred along the shelf east of the South Island (Nicholls *et al.* 1994, Birdlife International 2004, Waugh *et al.* 2005) and the Chatham Rise (Birdlife International 2004, Waugh *et al.* 2005).
- h. Outside the New Zealand region, satellite tracking of six failed breeders and non-breeders in 1996-1998 showed that northern royal albatrosses migrate to forage over the Patagonian Shelf in the Atlantic Ocean (Nicholls *et al.* 2002, 2005). However, one bird also foraged along the Chilean Shelf in the Pacific Ocean between February and September 1998 (Nicholls *et al.* 2002, 2005).

4. 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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