



Lineage – Scientific methodology

Breeding distribution of Auckland Island shag lineage

1. A “breeding colony” for New Zealand seabirds is defined as “any location where breeding has been reported and is considered by the expert compiling the species account to have occurred at that location at least until 2002”.
2. An “occasional breeding colony” for New Zealand seabirds is defined as “any location where breeding has been reported, but not necessarily continuously nor during consecutive breeding seasons, and is considered by the expert compiling the species account to have occurred at that location during the last 30 years”.
3. Literature sources were searched for breeding 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 - a. Scientific papers, published texts, unpublished reports and university theses available to the expert who prepared the distributional layers.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 1960-2009.
 - c. *OSNZ News* and *Southern Bird* for 1977–2009.
4. Other sources.
 - a. Nil.
5. The mapping of the Auckland Island shag breeding colonies at the Auckland Islands is based on written descriptions of their locations in Taylor (2000), Moore & McClelland (1990) and the 1:50 000 map of the Auckland Islands (Department of Survey & Land Information 1991). The colonies have not been surveyed for mapping purposes, and the mapping presented is based on the locations indicated in these three sources.
6. 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 breeding distribution data for Auckland Island shag were expedition reports, Marchant & Higgins (1990) and Taylor (2000).

- c. The Auckland Island shag is endemic to New Zealand and breeds only at the Auckland Islands (including Auckland, Enderby, Rose, Ewing, and Adams Islands; Taylor 2000); it probably breeds also at Disappointment Island (Penniket *et al.* 1986).
- d. The total population was estimated as <1000 breeding pairs (Robertson & Bell 1984), but there has been no systematic survey of the archipelago to ascertain the size of the population. A survey of the northern group of islands was completed in February 1988 when a minimum of 475 nests was found at 11 colonies and the total population estimated as at least 500 pairs on Enderby Island (Taylor 1988). In addition, this survey also located a colony of 62 nests on Rose Island and a large colony of several hundred adults on the south-east end of Ewing Island (Taylor 1988); Moore & McClelland (1990) counted 306 nests on Ewing Island in 1989. In December 1976 “moderate” numbers were reported on Disappointment Island, where it was probably breeding (Penniket *et al.* 1986).
- e. There is insufficient information to determine the population trend of Auckland Island shags on any of the islands in the archipelago.

7. References

The following sources provided useful information on the breeding distribution of this species. This is not an exhaustive list of all references to the species.

Marchant, S.; Higgins, P.J. (1990). *Handbook of Australian, New Zealand and Antarctic birds. Volume 1, Part A.* Oxford University Press, Melbourne. 735p.

Moore, P.J.; McClelland, P.J. (1990). Notes on the birds of the Auckland Islands, November-December 1989. Science & Research internal report No. 93, Department of Conservation, Wellington. 9p.

Penniket, A.; Garrick, A.; Breese, E. (1986). *Preliminary reports of expeditions to the Auckland Islands Nature Reserve 1973-1984.* Department of Lands & Survey, Wellington. 231p.

Robertson, C.J.R.; Bell, B.D. (1984). Seabird status and conservation in the New Zealand region. In: *Status and conservation of the world's seabirds.* Croxall, J.P.; Evans, P.G.H.; Schreiber, R.W. (eds). ICBP Technical Publication No. 2. pp. 573-586.

Taylor, G.A. (1988). Report to the Department of Conservation on an expedition to the Auckland Island National Reserve, February 1988. Unpublished report. 51p.

Taylor, G.A. (2000). *Action plan for seabird conservation in New Zealand. Part A: threatened seabirds*. Threatened species occasional publication No. 16, Department of Conservation, Wellington. 233p.