

S5 Abundance of Breeding Seabirds – Productivity of Breeding Seabirds

Scotland holds internationally important numbers of breeding seabirds (www.jncc.gov.uk/seabirds). The number of breeding seabirds (abundance) in a given year is a result of how many adults survive from the previous year and how many young birds successfully reach breeding age. Changes within the marine environment such as poor weather and low food availability can reduce adult survival and potentially lower breeding abundance. Some seabirds do not breed every year, so lower breeding abundance does not necessarily mean lower survival rates. The number of chicks produced each year (productivity) gives a good indication of food availability and other factors such as predation and weather conditions. Young seabirds delay breeding until they are three to nine years old (depending on species) and therefore impacts on productivity, and on the survival of young birds to maturity, become evident in the breeding population only after several years.



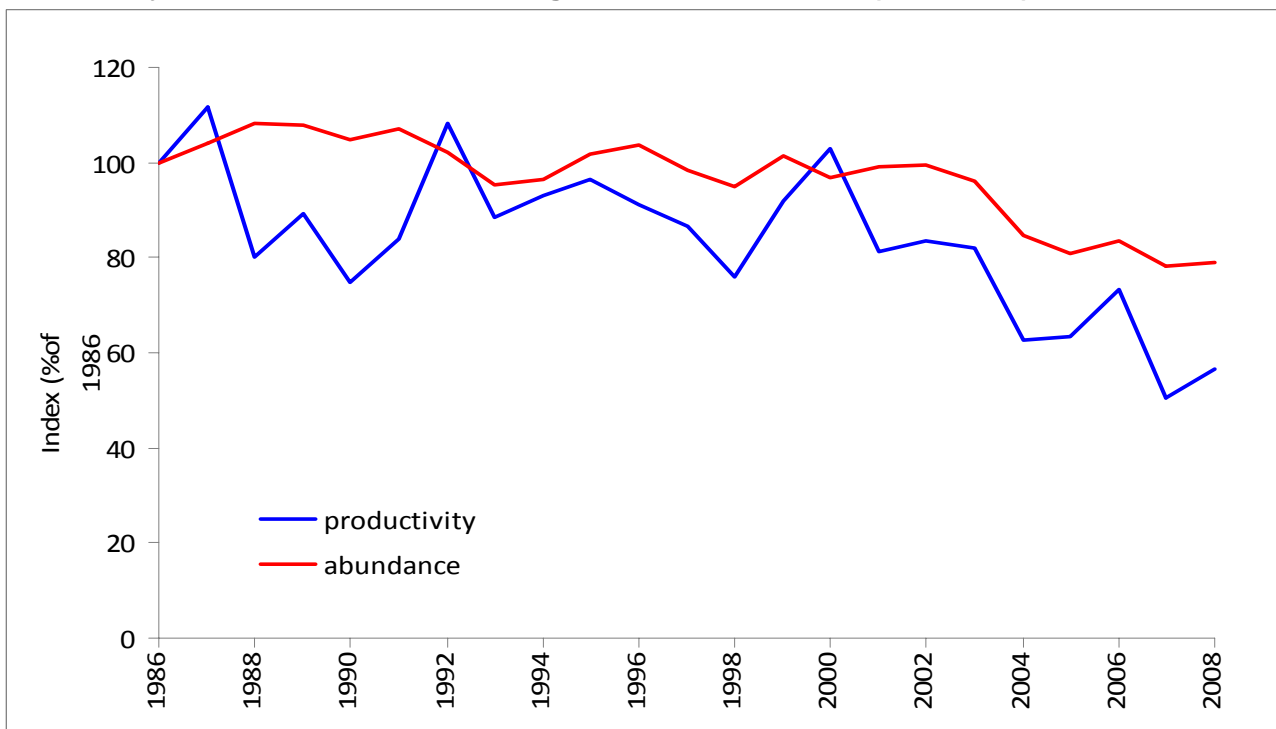
Arctic tern, SNH Images

Evidence

The indicator is based on the breeding numbers of 19 and productivity of 18 species of seabird out of the 24 that breed in Scotland, from a representative sample of colonies around Scotland. These are monitored as part of the UK Seabird Monitoring Programme which started in 1986.

Assessment

Productivity and Abundance of Breeding Seabirds in Scotland (1986-2008)



- Seabird abundance has been in decline since 1991; by 2008 it had fallen to 79% of the survey base year in 1986.
- Some species have increased in abundance e.g. razorbill (47%) and great skua (200%) since 1986, while others have shown greater declines e.g. kittiwake (55%), Arctic skua (71%) and Arctic tern (26%).
- Productivity has fluctuated but since 2000 it has declined to 58% in 2008.
- Common guillemots have experienced consecutive years of low productivity since 1996, with marked declines since 2002. Kittiwake productivity has declined steadily since 1986.

Trend	Decrease
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Data confidence	High
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Commentary

The abundance and productivity of breeding seabirds has declined since 1992 and more markedly since 2000. This is largely accounted for by declines among Arctic tern, Arctic skua and black-legged kittiwake.

The timing and location of declines varied from species to species. The overall result may be attributed to one or more factors that affect abundance and productivity, namely: food availability; weather conditions; and predation. In years of poor productivity species such as black-legged kittiwake that feed on small shoaling fish (e.g. lesser sandeel) have struggled to find enough food. A reduction in sandeel abundance in the North Sea is thought to be a result of changes lower down the food chain caused by warming of the sea as the climate changes ([MCCIP 2009](#)). Commercial sandeel fishing has in the past had a detrimental impact on kittiwake survival and productivity but little sandeel fishing is now conducted off Scotland. In certain populations predation by non-native invasive mammals (e.g. brown rat, American mink) has caused reductions in productivity and abundance at some colonies and complete abandonment of others (e.g. Craik 1997).

Source data and updates

The indicators of abundance and productivity were updated with data to 2008. Improved analysis and the use of a wider set of seabird data allows the abundance and breeding success of a greater number of species to be reported on than previously. Abundance is now reported for 19 species compared to the previous 13 (the new species are: black-headed gull, lesser black-backed gull, herring gull, great black-backed gull, black guillemot and Atlantic puffin). Productivity is now reported for 18 species compared to 16 (the new species are: lesser black-backed gull and herring gull).

Data are from the UK [Seabird Monitoring Programme \(SMP\)](#), which is co-ordinated by the [Joint Nature Conservation Committee](#) and supported by [Countryside Council for Wales](#), [Natural England](#), [Scottish Natural Heritage](#), [Northern Ireland Environment Agency](#), [Royal Society for the Protection of Birds](#), [Shetland Oil Terminal Environmental Advisory Group](#), [The Seabird Group](#), [Centre for Ecology and Hydrology](#), [British Trust for Ornithology](#), [The National Trust](#), [The National Trust for Scotland](#)

The SMP collects and collates data on breeding numbers, demographic parameters (including productivity) and diet from a sample of colonies around the UK.

Updates are provided annually.

UK Indicators

In the [UK indicator](#), seabird abundance is reported alongside other wild bird trends. Scotland supports the majority of UK breeding seabirds, therefore the UK trend is greatly influenced by trends in Scotland. The UK trend shows a steady increase between 1970 and 1990, followed by fluctuation and since 2000 it has declined. The analytical model developed for Scotland provides improved estimates and will be adopted at the UK level.

References

Craik, J. C. A. 1997. Long-term effects of North American Mink *Mustela vison* on seabirds in western Scotland. *Bird Study* 44:303-309.

Frederiksen, M., Jenson, H., Daunt, F., Mavor, R. and Wanless, S. 2008. Differential effects of a local industrial sand lance fishery on seabird breeding performance. *Ecological Applications*, 18(3): 701–710.

[MCCIP 2009](#). Marine Climate Change Ecosystem Linkages Report Card. (Eds. Baxter J.M., Buckley P.J. & Frost M.J.), Summary report, MCCIP, Lowestoft, 16pp. www.mccip.org.uk/arc