

SEABIRDS IN SCOTLAND

Prepared by Simon Foster and Sue Marrs of SNH Knowledge Information Management Unit using results from the Seabird Monitoring Programme and the Joint Nature Conservation Committee

Scotland has internationally important populations of several seabirds. Their conservation is assisted through a network of designated sites. Figure 1 shows the distribution of the 50 Special Protection Areas (SPA) which have seabirds listed as a feature of interest. The map shows the widespread nature of the sites and the predominance of important seabird areas on the Northern Isles (Orkney and Shetland), where some of our largest seabird colonies are present.

The most recent estimate of seabird populations was obtained from Birds of Scotland (Forrester *et al.*, 2007). Table 1 shows the population levels for all seabirds regularly breeding in Scotland.

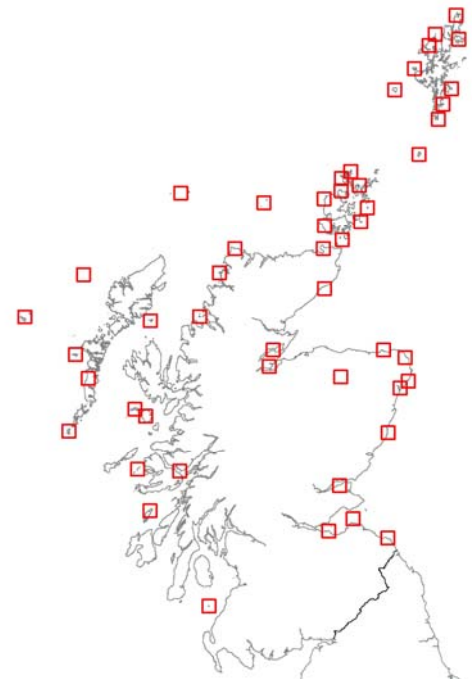


Table 1: Population Estimates for Breeding Seabirds in Scotland.

Species*	Breeding Estimate	Unit**
Northern fulmar	486,000	AOS
Manx shearwater	126,545	AOS
European storm-petrel	31,570+	AOS
Leach's storm-petrel	48,057	AOS
Northern gannet	182,511	AOS
Great cormorant	c. 3,600	AON
European shag	21,500-30,000	PAIRS
Arctic skua	2,100	AOT
Great skua	9,650	AOT
Black headed gull	43,200	AON
Common gull	48,100	AON
Lesser black-backed gull	25,000	AON
Herring gull	72,100	AON
Great black-backed gull	14,800	NESTS
Black-legged kittiwake	282,200	AON
Little tern	331	AON
Sandwich tern	1,100	AON
Common tern	4,800	AON
Roseate tern	4	PAIRS
Arctic tern	47,300	AON
Common guillemot	791,400	PAIRS
Razorbill	93,300	PAIRS
Black guillemot	18,750	PAIRS
Atlantic puffin	493,000	PAIRS

* NOTE – Species in bold are those whose trends can be calculated and are detailed in this Trend Note

** NOTE – AOT = Apparently Occupied Territory; AOS = Apparently Occupied Site; AON = Apparently Occupied Nest

Figure 1: Special Protection Areas for Seabirds in Scotland.

Key Points

- Trends are described for 11 of the 24 species of seabirds breeding in Scotland
- Nine have shown sustained declines over the past 20 years. Two have remained stable.
- The reasons for the declines are complex – changes to food availability, climate change and the effects of non-native species



Common guillemots, Isle of May NNR
© Lorne Gill SNH

Seabird Trends

Trends can be calculated for 11 of the 24 seabird species. Of these, nine of our commonest seabird species have shown sustained declines over the past 20 years (Table 2). The reasons for the declines are complex and may be a result of changes in fishing effort (resulting in changes to food availability), climate change (altering prey distributions and resulting in mortality of some species due to extreme weather events) and the effects of non-native species (such as rats on islands).



Atlantic puffin © Lorne Gill SNH

Seabirds tend to be long lived and do not begin breeding until at least two or three years old (up to nine years in the case of northern fulmar), during which time some of these immature birds will remain at sea for long periods and occasionally visit the sites where they were reared (natal areas) and other sites (Votier *et al.*, 2011). Our knowledge of seabird populations has been greatly improved by several long-term studies at colonies throughout Scotland. These include the Isle of May¹, Canna, Rum, Eynhallow and Fair Isle. Three of these sites form part of the JNCC Key Monitoring Sites – Isle of May; Canna; and Fair Isle. Being long-lived species, studies of over 20 years are vital to improving our understanding of seabirds. Recent advances in technology are starting to yield further insights into the movements and behaviour of seabirds at sea (e.g. Frederiksen *et al.*, 2012; Harris *et al.*, 2009).

In this Trend Note we explore the changes for individual seabird species and highlight the possible reasons for the changes that have been observed. Where data are available we present the indices for abundance and productivity. Abundance is the number of seabirds, productivity is the measure of breeding output – the number of chicks surviving to fledging. Productivity tends to change more quickly than abundance and can show within-season effects, whereas abundance shows changes in the numbers over longer time periods.

Data Sources and Methods

The data come from the Seabird Monitoring Programme. This is a partnership comprising volunteers and professionals who undertake monitoring at a number of Scotland's seabird colonies each year. National censuses, which aim to count all seabirds around the UK coasts are undertaken periodically. The last census was in 1998 to 2002 (Mitchell *et al.*, 2004). The counts and productivity data are collected using a defined set of methods (Walsh *et al.*, 1995).

The primary source of information for describing the pressures and threats that Scotland's seabirds are facing is *The Birds of Scotland* (Forrester *et al.*, 2007).

All graphs and results presented were generated using data freely available online at the JNCC website (http://jncc.defra.gov.uk/docs/Data_points_1986-2011.xls).

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Table 2: Changes in Abundance of Scotland's Seabirds (1986 – 2011).

Species	% Change in Abundance
Northern fulmar	-7
European shag	-47
Arctic skua	-74
Herring gull	-58
Great black-backed gull	-53
Black-legged kittiwake	-66
Sandwich tern	-48
Common tern	-43
Arctic tern	-72
Common guillemot	-24
Black guillemot	<+1*

* Black guillemot trend is based on the change between the two national censuses (1982 – 1991 and 1999 – 2000)

¹ www.ceh.ac.uk/sci_programmes/IsleofMayLong-TermStudy.html

Feeding and Nesting Preferences

Seabirds have their own special requirements for feeding and breeding. A study by Parsons *et al.* (2006) matched the individual species to a range of groupings, such as whether they nested on cliffs, fed on sandeels or on discards. Table 3 summarises these feeding and nesting preferences for 11 seabird species. These are also summarised on each species account.

Table 3: Seabird Species Groupings.

	Surface feeder	Sub-surface feeder	Sandeel specialist	Discard feeder	Inshore feeder	Offshore feeder	Cliff nester	Flat-ground nester
Northern fulmar	X			X		X	X	*
European shag		X	X		X		X	*
Arctic skua	X		X		X			X
Black-legged kittiwake	X		X			X	X	
Sandwich tern	X		X		X			X
Common tern	X		X		X			X
Arctic tern	X		X		X			X
Common guillemot		X	X			X	X	*
Black guillemot		X			X		X	X
Herring gull	X			X	X	X	X	X
Great black-backed gull	X			X	X	X	X	X

*Note – although northern fulmar, European shag and common guillemot are listed as predominantly cliff nesters on some sites they do use flat ground for nesting

Trend and Conservation Status		
Stable	Amber	LC
SCOT	BoCC	IUCN

Trend and Conservation Status

For each seabird species there is a table summarising the trend and conservation status at Scotland, UK and International levels.

SCOT – Trend for Scotland – Stable, Increasing or Declining.

BoCC – Birds of Conservation Concern (Eaton *et al.*, 2009) – UK assessment – Red list species show severe declines, Amber list species show moderate declines.

IUCN – International Union for Conservation of Nature – A global assessment of the conservation status of species (www.iucn.org) – LC = Least Concern.

Most of our seabirds come back to breed at the same sites year after year. This is often known as site faithfulness or site fidelity.

One group of species, which are not quite as site faithful are the terns (Sandwich, Arctic and common). These can breed for many years at one site and then move to another area. Sometimes it may be possible to suggest why they have moved (e.g. American mink eating the chicks and eggs); at other times the reasons are not at all clear.

The numbers of terns therefore can vary considerably from year to year at any individual colony.



Sandwich terns, Sands of Forvie NNR © Lorne Gill SNH

Feeding and Nesting Preferences				Trend and Conservation Status		
Surface feeder	Discard feeder	Offshore feeder	Cliff nester	Stable	Amber	LC
				SCOT	BoCC	IUCN

Northern Fulmar

The fulmar is a widespread breeding seabird. Fulmars are a relatively recent coloniser around the coast, having historically been restricted to St Kilda. In the late 1800s they began spreading and now they breed around Scotland's coasts. They are amongst our longest-lived of seabirds; the oldest bird known is over 40 years old. There have been several long term studies undertaken on fulmars, perhaps most famous are the studies on Eynhallow (Dunnet, 1992), started in the 1950s and still running today. Technological advances have started to provide us with a greater understanding of fulmar movements throughout the breeding season. GPS tracking devices attached to fulmars by researchers from Aberdeen University has shown that some birds undertake long foraging (distance and duration) trips during the breeding season (<http://www.abdn.ac.uk/lighthouse/blog/TransAtlantic-traveller/>). Tasker (2007) listed the main threats to fulmars as being predation by brown rats and American mink, changes in food supply and long-line fishing. Fulmars are also susceptible to marine litter. The level of plastics contained in fulmars found dead is recorded and measured as part of a Europe-wide Ecological Quality Objective (EcoQO).

http://qsr2010.ospar.org/media/assessments/EcoQO/EcoQO_09_Reduce_litter_in_fulmar_stomachs.pdf

Since the start of the monitoring period the trend for fulmar has remained relatively stable.

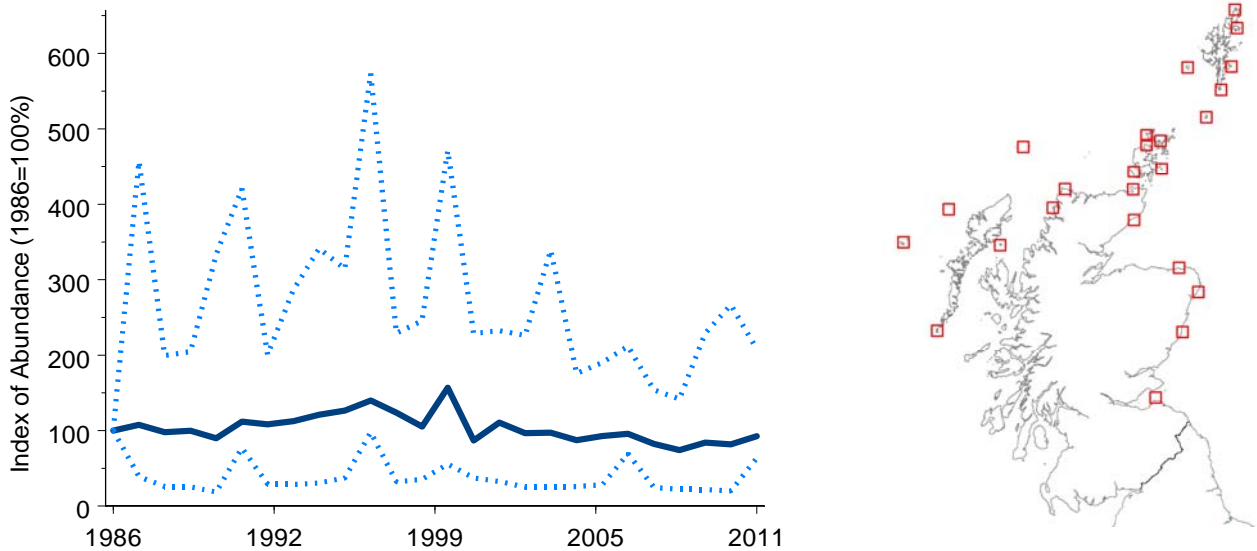
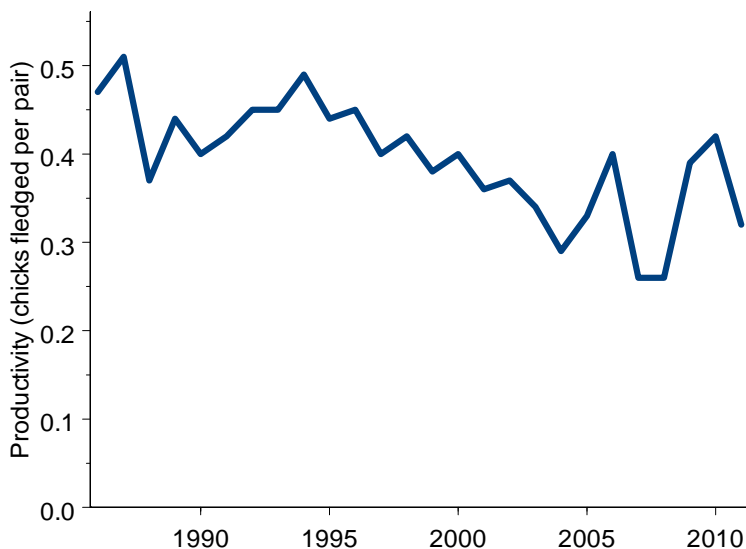


Figure 2: Northern fulmar breeding abundance (solid line) in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Fulmar productivity has declined over the monitoring period and now appears to be more variable.



Northern fulmar © Lorne Gill SNH

Figure 3: Productivity of northern fulmars in Scotland (1986 to 2011).

Feeding and Nesting Preferences				Trend and Conservation Status		
Sub-surface feeder	Sandeel specialist	Inshore feeder	Cliff nester	Declining	Amber	LC
				SCOT	BoCC	IUCN

European shag

The European shag is a widespread breeding species, breeding throughout Europe north to Finland and south to Morocco. They breed around the coasts of Scotland on suitable cliffs, caves and crevices. They feed on a range of small fish, with the main prey being sandeels during the breeding season. Wanless and Harris (2007) listed the main threats to shags as being oil, introduced mammals, over-fishing of sandeels and climate change, in particular the predicted increase in extreme weather events. Our knowledge of shags has been greatly improved thanks to two long term studies on the Isle of May and on Canna. Since 1987, shags have shown a declining trend in their abundance.

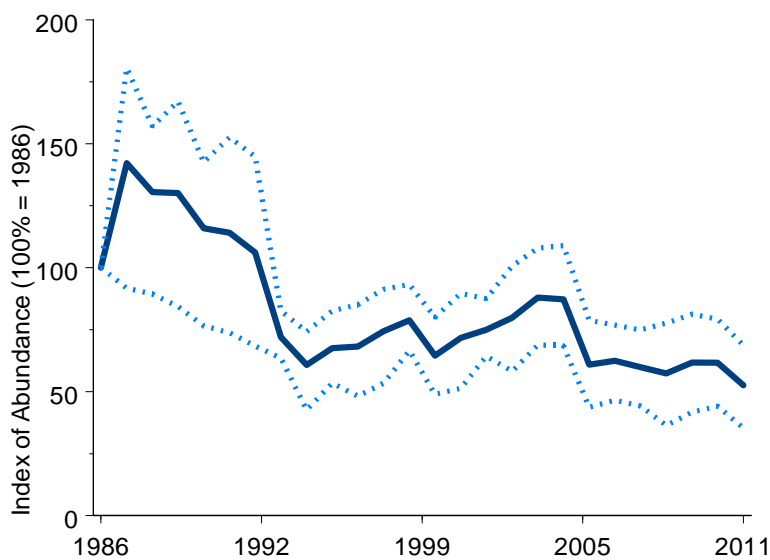
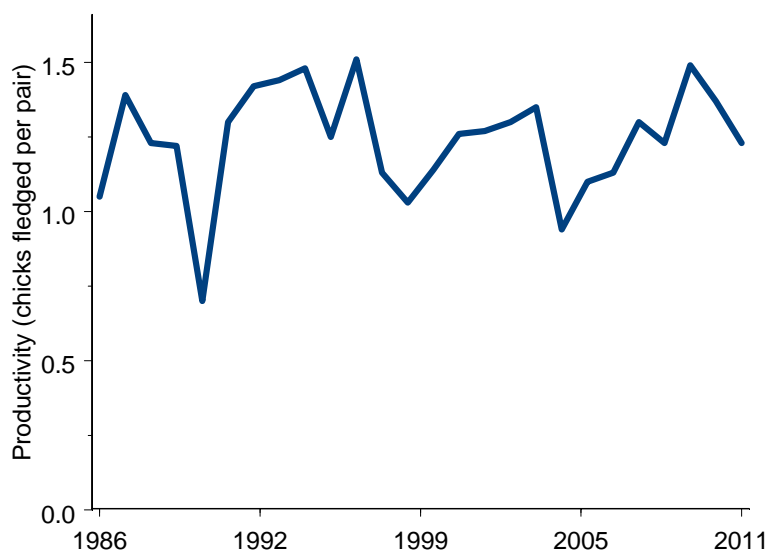


Figure 4: European shag breeding abundance (solid line) in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Productivity has been variable, showing no clear trend over the monitoring period. Weather can play an important factor in shag breeding success, frequent onshore winds during this time reduce the ability of adults to find food for chicks (Frederiksen *et al.* 2008).



European shag © Lorne Gill SNH

Figure 5: Productivity of European shags in Scotland (1986 to 2011).

NOTE: This shag is fitted with a highly visible colour ring. If you see a bird like this, please record where and when you saw it and note the colour of the ring, the colour of the letters and the code. Often a picture can help as well. You can send your sightings in to shags@ceh.co.uk

Feeding and Nesting Preferences				Trend and Conservation Status		
Surface feeder	Sandeel specialist	Inshore feeder	Flat-ground nester	Declining	Red	LC
				SCOT	BoCC	IUCN

Arctic skua

The Arctic skua is a localised breeding species in Scotland (Furness, 2007). It is the smaller of the two breeding skua species in Scotland. They obtain much of their prey by stealing from other seabirds such as black-legged kittiwakes, terns and auks (such as guillemots); pursuing the birds until they release their own food (known as kleptoparasitism). Furness (2007) outlined the main threats acting upon the population as depredation by great skuas; sandeel scarcity; breeding habitat loss and human persecution. In a long term study of skuas on Handa Island, Jones *et al.* 2008, conclude that the Arctic skua colony is in decline, probably due to pressure from great skuas.

Since 1986, this species has shown a steady decline in abundance throughout its breeding range in Scotland (Figure 6.).

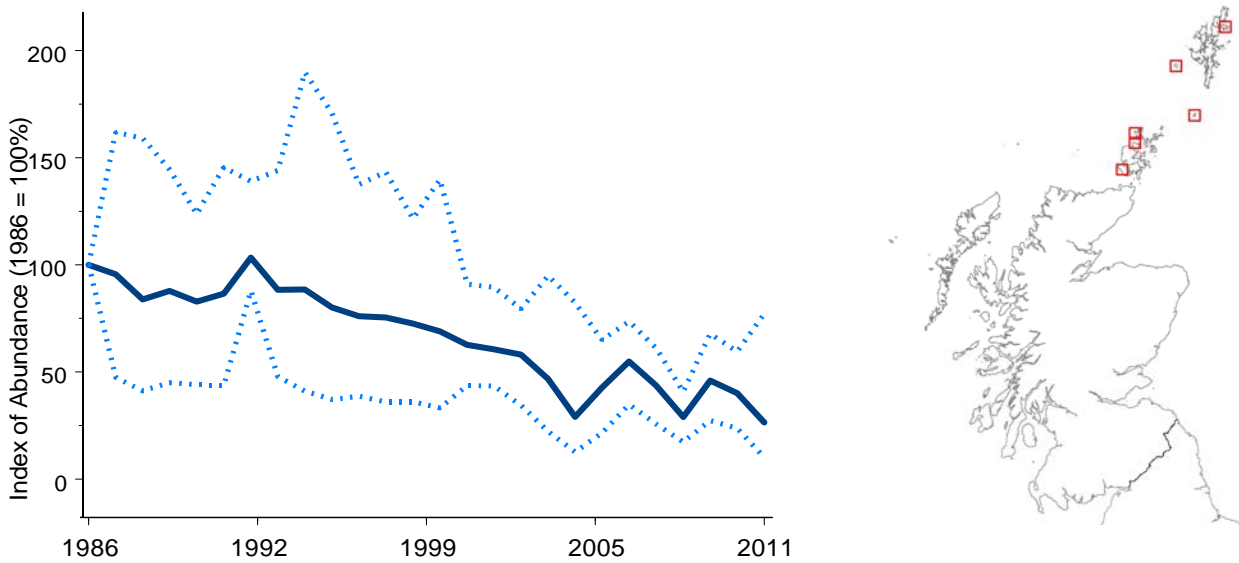
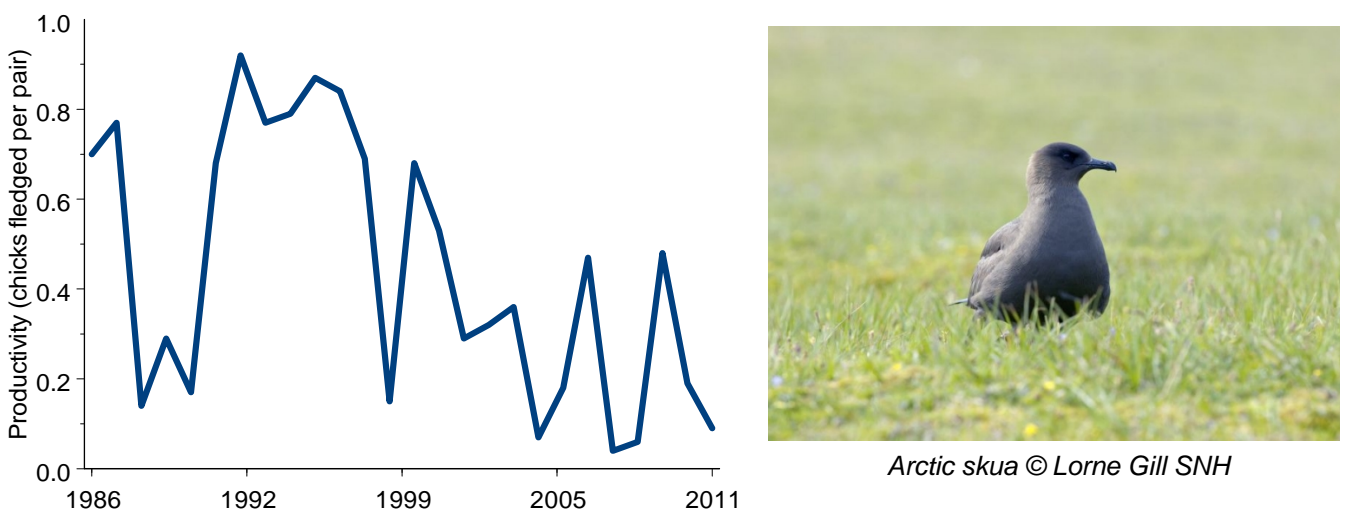


Figure 6: Arctic skua breeding abundance in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Arctic skua productivity has been variable (Figure 7.). Since 2001, the productivity has been lower than the preceding years. Four recent years have had all time low value (2004, 2007, 2008 and 2011). The reasons for the low productivity may be a combination of effects such as depredation by great skuas and a reduction in prey availability (Jones, *et al.* 2008; Furness, 2007).



Arctic skua © Lorne Gill SNH

Figure 7: Arctic skua Breeding Productivity in Scotland (1986 to 2011).

Feeding and Nesting Preferences						Trend and Conservation Status		
Surface feeder	Discard feeder	Inshore Feeder	Offshore feeder	Cliff nester	Flat-ground nester	Declining	Red	LC
						SCOT	BoCC	IUCN

Herring gull

Herring gulls are a widespread breeding species. They are perhaps the gull that is mostly referred to as a 'seagull', being present in all of Scotland's coastal towns. Numbers are declining in their natural coastal nesting sites and there is an increasing trend towards urbanisation of this species. Overall the trend has been for decreasing numbers throughout their range, such that they are now listed as being of "Red" conservation status. Monaghan (2007) listed changes in food availability and disease as being the main threats.

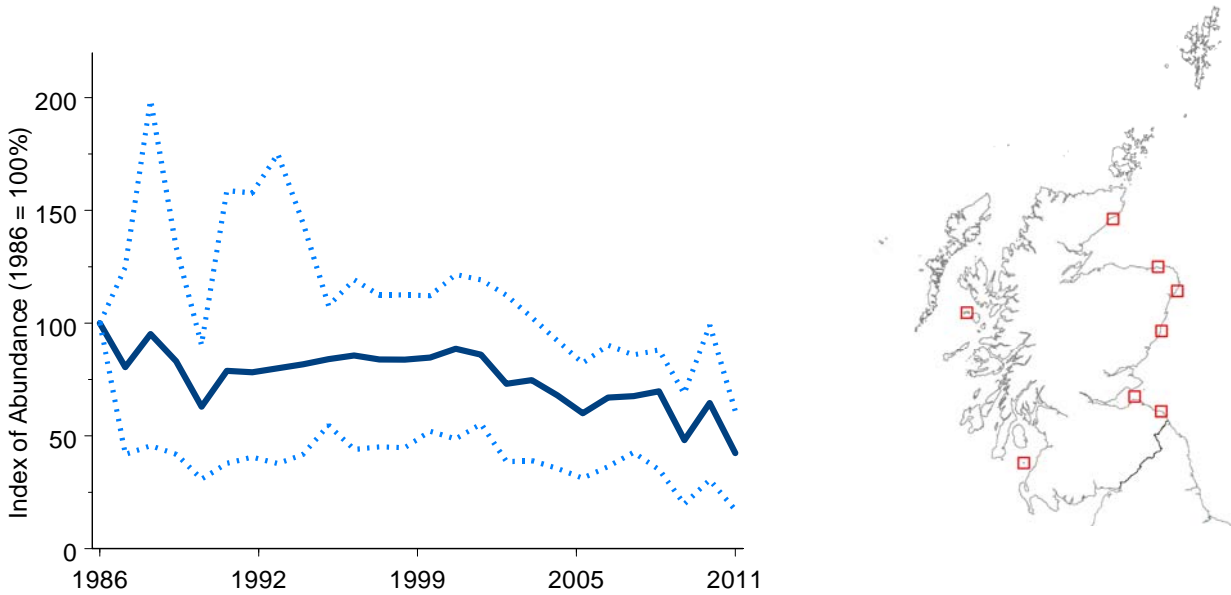
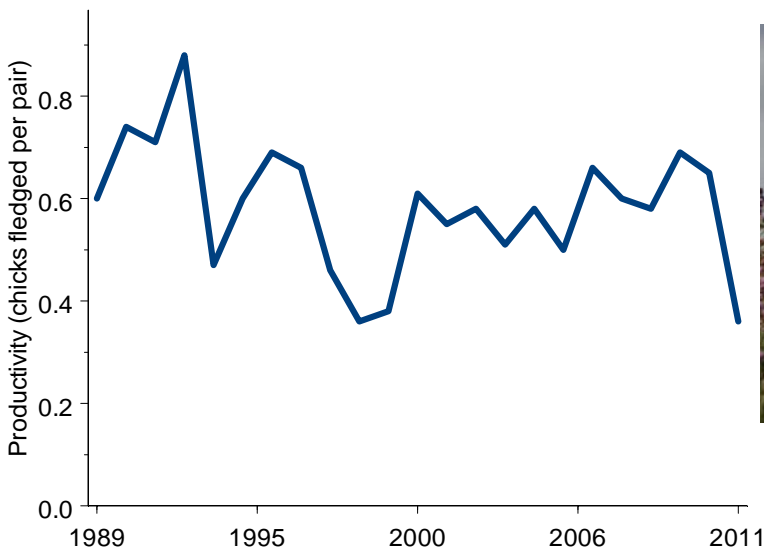


Figure 8: Abundance of herring gulls in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Productivity has varied over the period though shows no clear trend.



Herring gull © Lorne Gill SNH

Figure 9: Productivity of herring gulls in Scotland (1986 to 2011).

Feeding and Nesting Preferences						Trend and Conservation Status		
Surface feeder	Discard feeder	Inshore Feeder	Offshore feeder	Cliff nester	Flat-ground nester	Declining	Amber	LC
						SCOT	BoCC	IUCN

Great black-backed gull

This is the largest breeding gull in Scotland. Great black-backed gulls tend to breed in relatively small numbers around the coast and are largely sedentary, with birds undertaking small movements. Zonfrillo (2007) identified the main threats acting upon the population as human persecution, botulism and viral infection, and predation by brown rats and American mink. Great black-backed gulls have a varied diet (including rabbits, other seabirds and a range of fish).

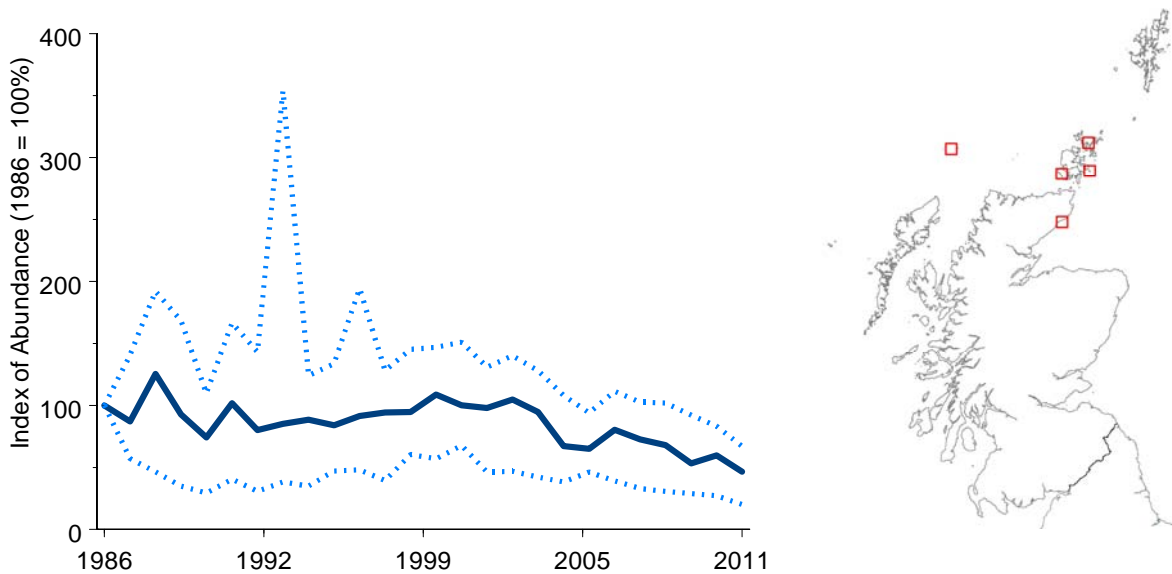


Figure 10: Abundance of great black-backed gulls in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Productivity has been variable but shows a decline since 2000. In 2002 it was at its lowest level as a result of widespread breeding failures throughout the country.

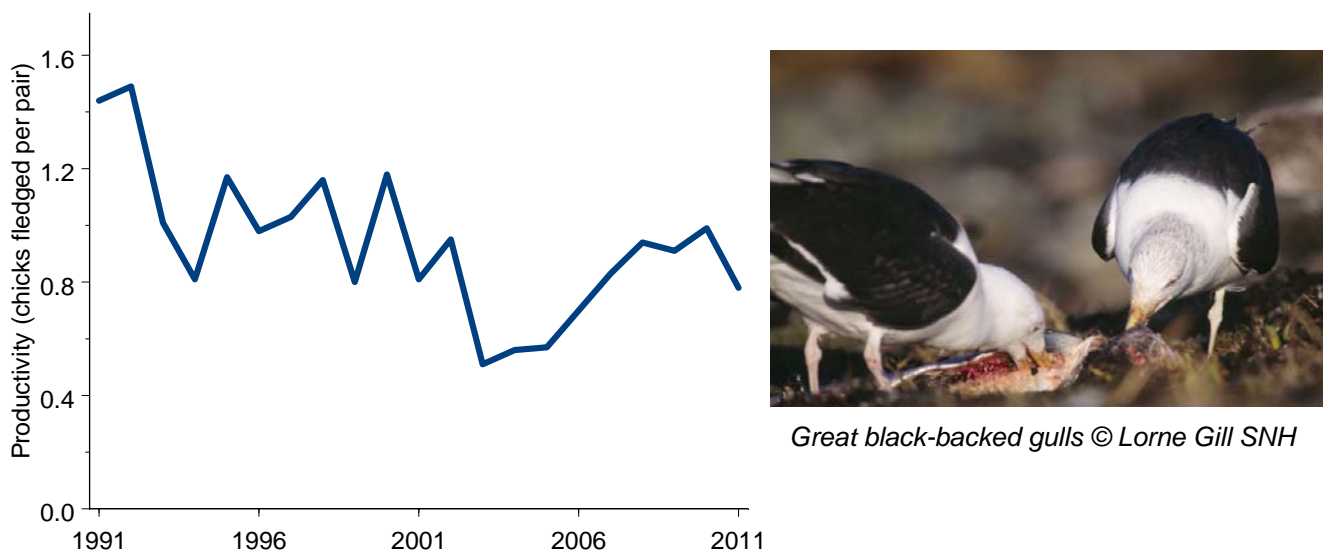


Figure 11: Productivity of great black-backed gulls in Scotland (1991 to 2011).

Feeding and Nesting Preferences				Trend and Conservation Status		
Surface feeder	Sandeel specialist	Offshore feeder	Cliff nester	Declining	Amber	LC
				SCOT	BoCC	IUCN

Black-legged kittiwake

The kittiwake is a common and widespread circumpolar breeding seabird. In Scotland they typically breed on cliffs on exposed rocky coasts (Heubeck, 2007). The key areas for kittiwakes in Scotland are along the east coast and in the Northern Isles. Numbers peaked around the early 1990s and have subsequently declined to their lowest point in 2011. In recent years the Northern Isles in particular have witnessed complete colony failures as birds have struggled to find sufficient food for their chicks. Heubeck (2007) identified the main threats to kittiwakes as being food shortage; climate change and localised predation at colonies.

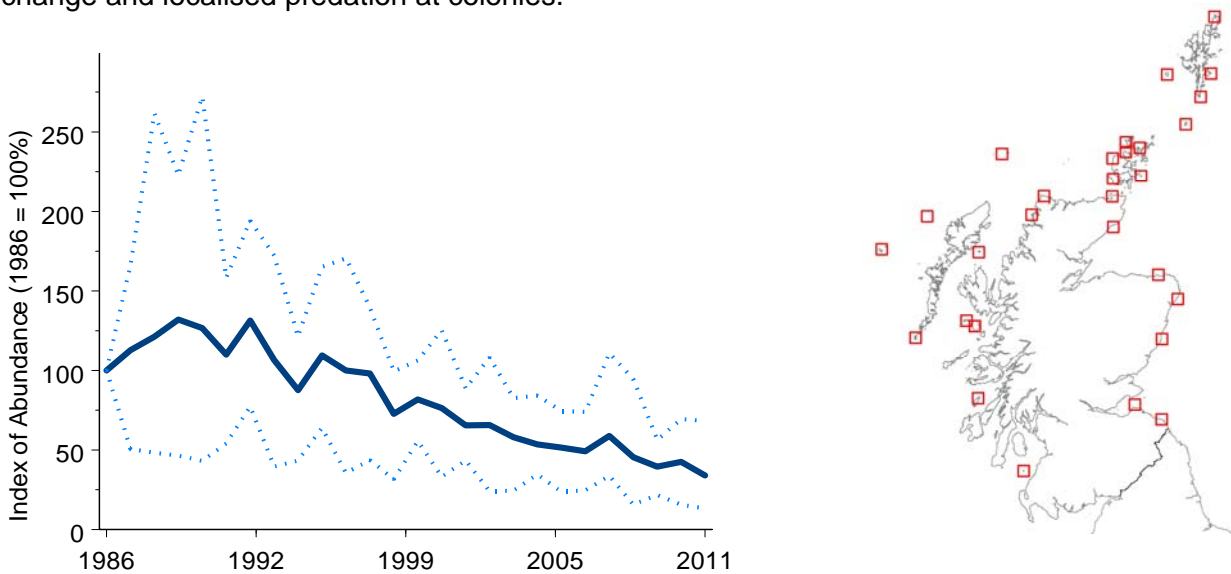


Figure 12: Kittiwake breeding abundance (solid line) in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Kittiwake breeding productivity has shown a gradual decline in terms of the numbers of chicks being fledged per pair. From around 2000 the productivity declined to its lowest point in 2008, this coincided with large-scale colony failures of kittiwakes throughout the Northern Isles and along the east coast of Scotland. In 2010 there was an improvement in breeding success.

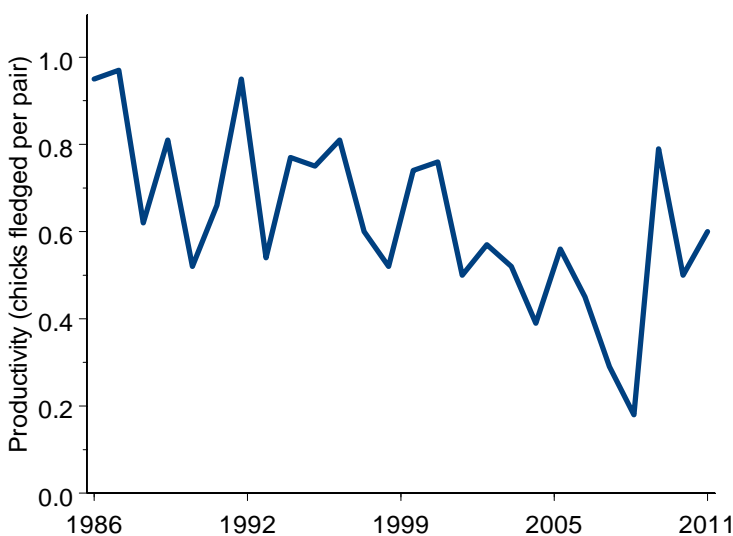


Figure 13: Kittiwake breeding productivity in Scotland (1986 to 2011).



Black-legged kittiwake © Lorne Gill SNH

Feeding and Nesting Preferences				Trend and Conservation Status		
Surface feeder	Sandeel specialist	Inshore feeder	Flat-ground nester	Declining	Amber	LC
				SCOT	BoCC	IUCN

Sandwich tern

The Sandwich tern is a common summer migrant. They breed mainly on the east coast with the largest colony being just north of Aberdeen at the Sands of Forvie National Nature Reserve (NNR). The breeding locations around Scotland have changed over the years. Even the large colony at Forvie has had periods when no birds bred, this can be a natural phenomenon of tern colonies (terneries) or it may be due to the presence of predators or excessive disturbance. Smith (2007) listed the main threats to sandwich terns as being human disturbance, aerial and ground predators and food shortage. On the Sands of Forvie NNR habitat management and predator exclusion has improved the numbers of terns breeding annually. This site strongly influences the Scotland trend. The trend shows that Sandwich terns have declined from 1986 to 1992 and since then remained relatively stable. As a result of the small number of sites on which the trend is based, the confidence in the assessment is low for some of the years.

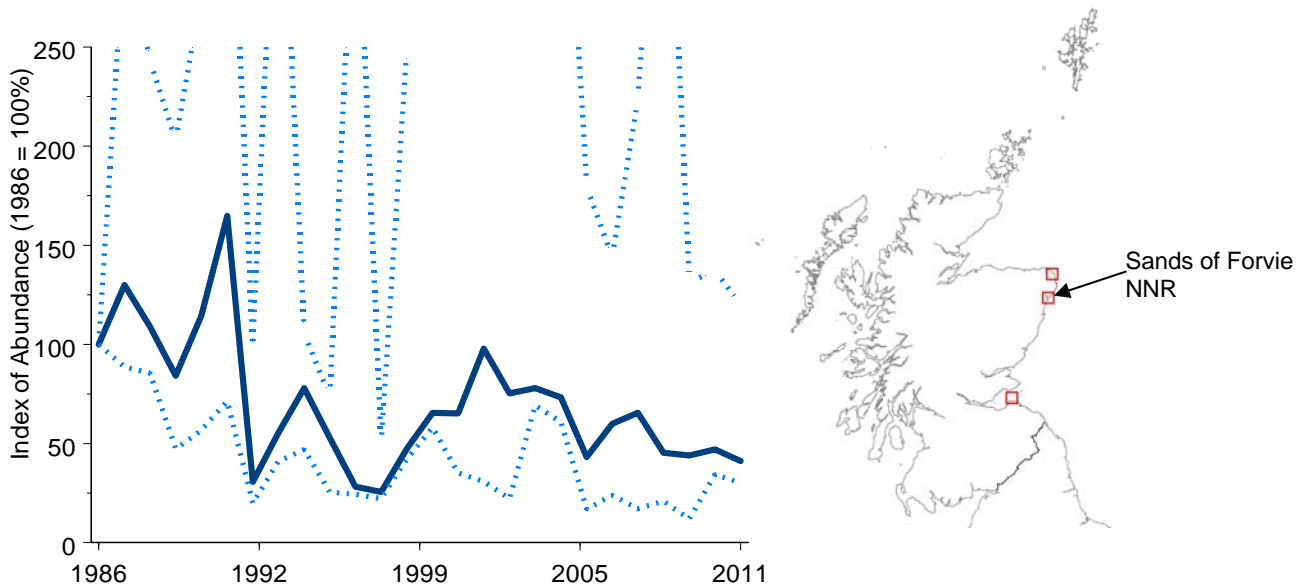


Figure 14: Abundance of Sandwich terns in Scotland (1986 to 2011) with 95% confidence limits (dotted line; drawing of upper limit restricted to preserve detail in the abundance index), and distribution across Scottish SPAs.

Productivity has varied over time. In 2005 shortages of sandeels were considered the likely cause of the low breeding success.

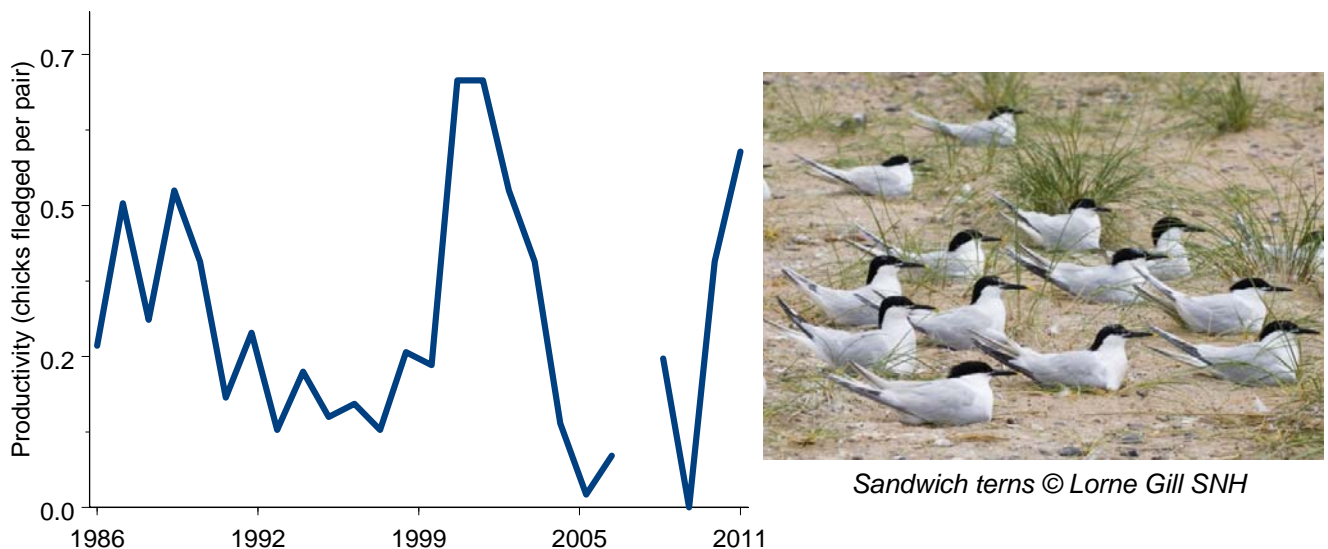


Figure 15: Productivity of Sandwich terns in Scotland (1986 to 2011).

NOTE – No productivity data were available in 2007.

Feeding and Nesting Preferences				Trend and Conservation Status		
Surface feeder	Sandeel specialist	Inshore feeder	Flat-ground nester	Declining	Amber	LC
				SCOT	BoCC	IUCN

Arctic tern

The Arctic tern is a widespread circumpolar breeding species. In Scotland their distribution tends to be in the Northern and Western Isles. They feed mainly on small shoaling fish, and sandeels can form an important component of their diet. They are amongst our most travelled of migrant birds. Recent results from a study in Greenland by Egevang *et al.* (2010) revealed that they undertook an annual migration route from their breeding grounds to the Antarctic Ice sheet, a trip of more than 80,000km annually for some individuals. The main threats acting upon Arctic terns in Scotland are food availability and the presence of non-native predatory mammals (Craik, 2007).

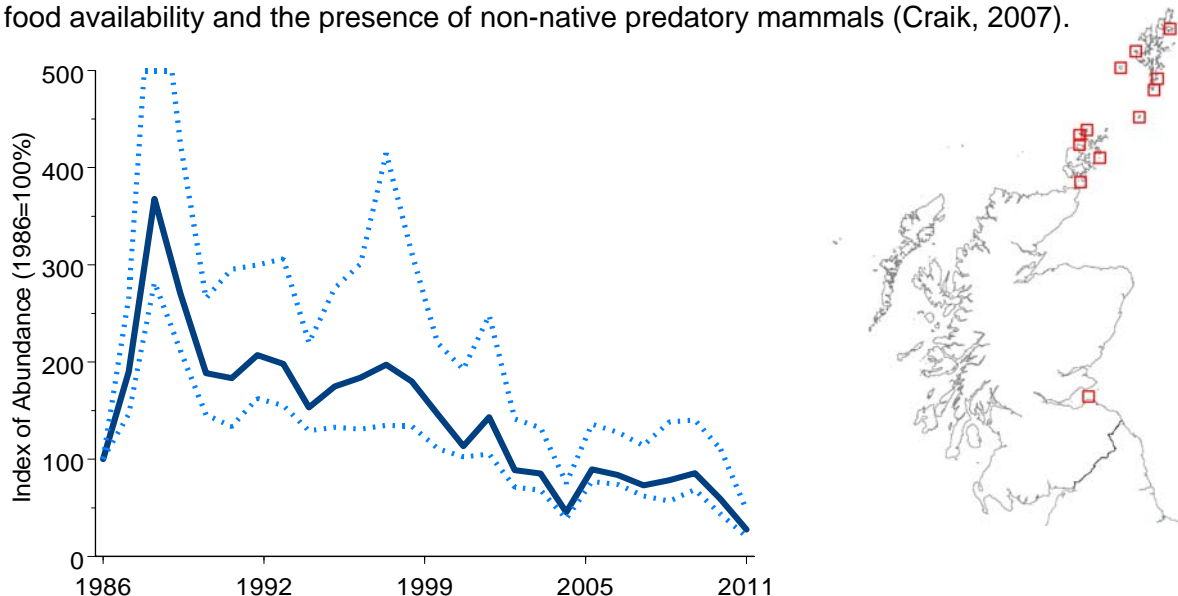
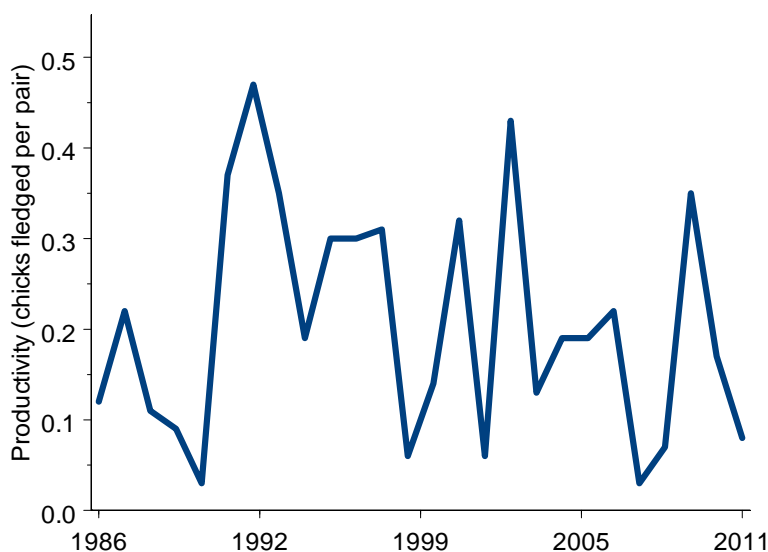


Fig. 16: Arctic tern breeding abundance (solid line) in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Since 1986, Arctic terns have steadily declined, reaching their lowest levels in 2011 (Fig 3). The reasons for the declines are linked to food shortages in their northern breeding strongholds and on some sites the presence of non-native mammals such as American mink has had large impacts (see Craik, 1997). Declines in populations have also been reported from the Faroe Islands (Schreiber and Kissling, 2005). Productivity shows no clear trend.



Arctic tern © Lorne Gill SNH

Figure 17: Arctic tern breeding productivity in Scotland (1986 to 2011).

Feeding and Nesting Preferences				Trend and Conservation Status		
Surface feeder	Sandeel specialist	Inshore feeder	Flat-ground nester	Declining	Amber	LC
				SCOT	BoCC	IUCN

Common tern

Common terns are a widespread breeding seabird. They breed throughout the northern hemisphere. They are migratory, with birds in Scotland being recorded on wintering grounds in West Africa. Two factors which affect breeding birds are listed by Craik (2007) as predation of eggs and chicks by mammals and food shortages. In particular American mink have led to long term declines in western Scotland (Craik, 1997). There are also potential threats from birds being hunted by humans around the coasts of their wintering grounds. Common terns use a variety of nest sites with birds nesting on man made structures (e.g. fish farms) to more traditional shingle banks.

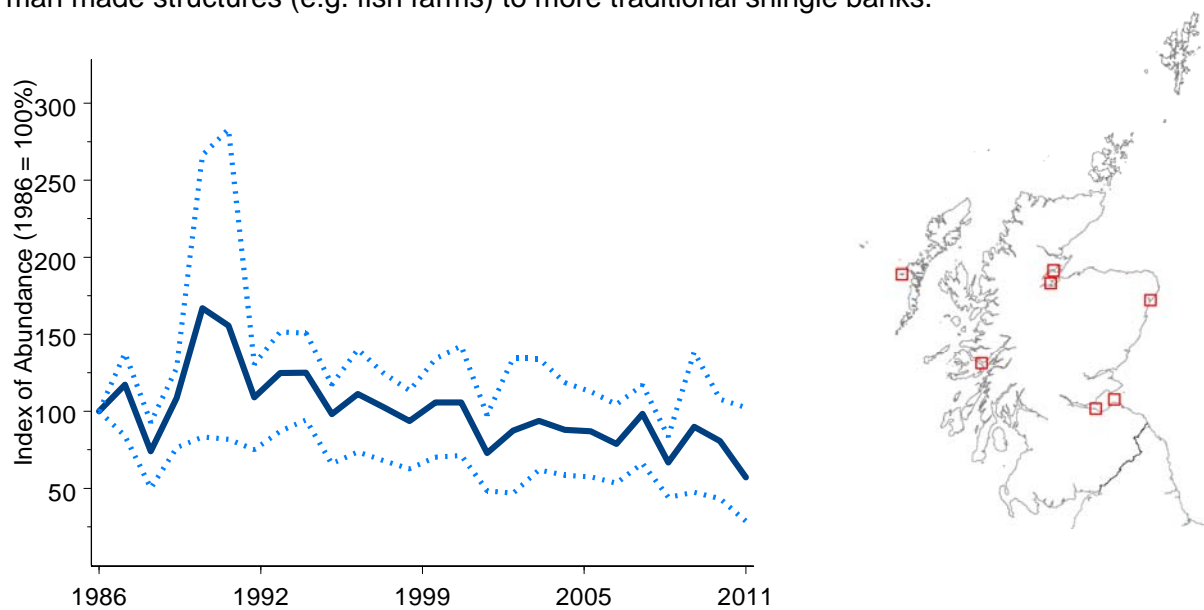
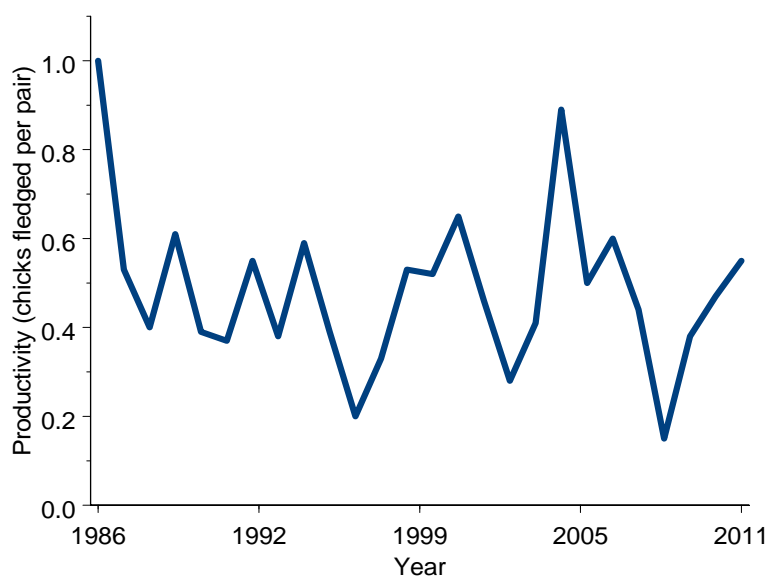


Figure 18: Abundance of common terns in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

Common terns have shown a steady gradual decline since 1992.

Productivity at a national level shows no clear trend, but is consistently lower than the high point of the 1986 baseline.



Common tern © Lorne Gill SNH

Figure 19: Productivity of common terns in Scotland (1986 to 2011).

Feeding and Nesting Preferences				Trend and Conservation Status		
Sub-Surface feeder	Sandeel specialist	Offshore feeder	Cliff nester	Declining	Amber	LC
				SCOT	BoCC	IUCN

Common guillemot

Guillemots are one of our most abundant seabirds, with around 750,000 pairs, approximately 10-11% of the world population (Mitchell *et al.*, 2004). They breed around the coastal cliffs of Scotland, with the main concentrations in the north and west (Harris and Wanless, 2007). They feed on a range of small shoaling fish (including sandeels, which can form an important component of their diet). Harris and Wanless (2007) identified the main threats as oiling, overfishing of sandeels, climate change and disturbance to colonies.

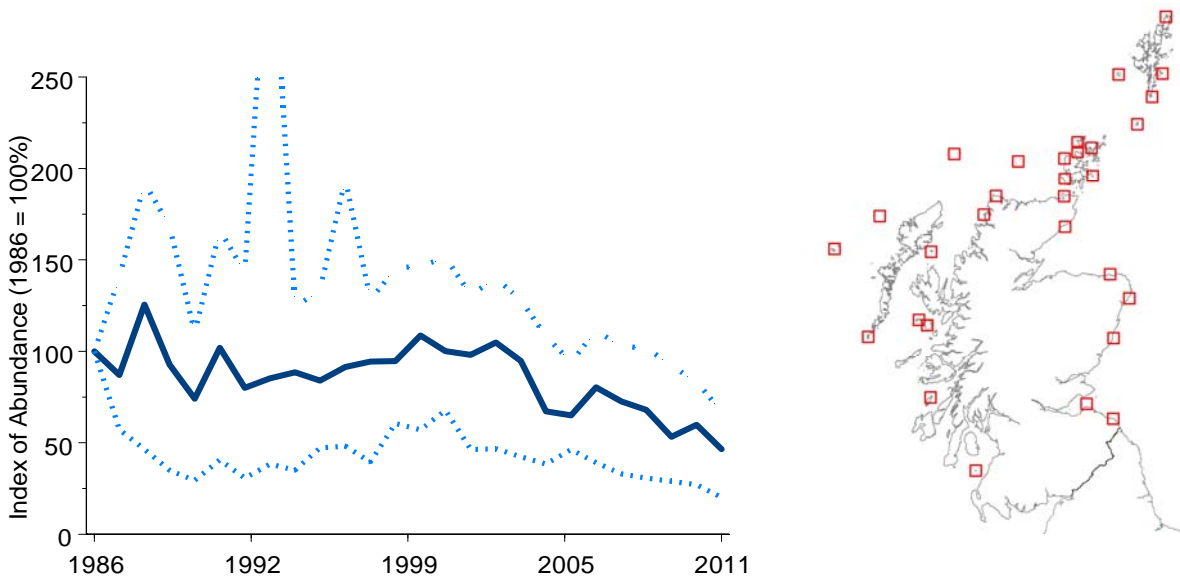


Figure 20: Guillemot breeding abundance (solid line) in Scotland (1986 to 2011) with 95% confidence limits (dotted line; drawing of upper limit restricted to preserve detail in the abundance index), and distribution across Scottish SPAs.

Productivity has declined since 2001, reaching its lowest level in 2006 and 2007. Since then it has risen slightly. The reasons for the decline in productivity vary across Scotland – from predation at some colonies by non-native mammals to problems with sandeel stocks. Wanless *et al.* (2005), showed that one of the reasons for breeding failure of guillemots on the Isle of May was not due to fewer fish being brought in to the colony, rather it was due to those fish being of a lower quality (energetic value).

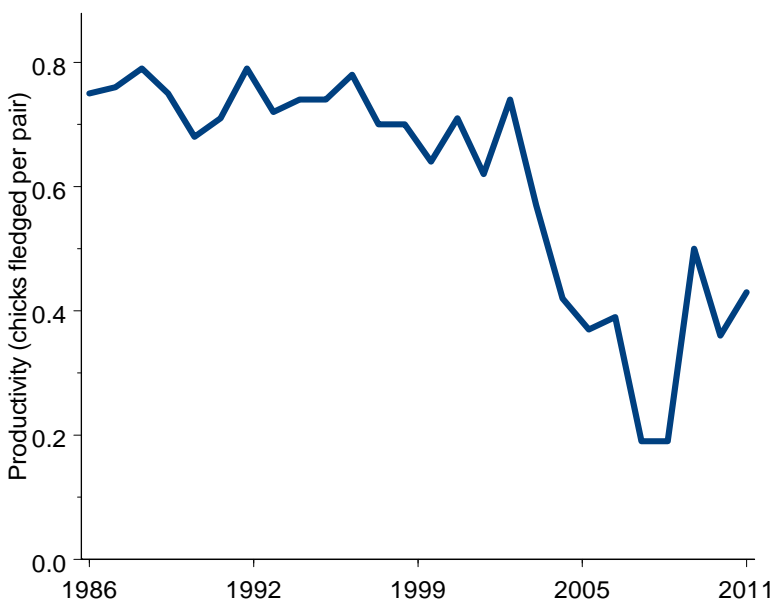
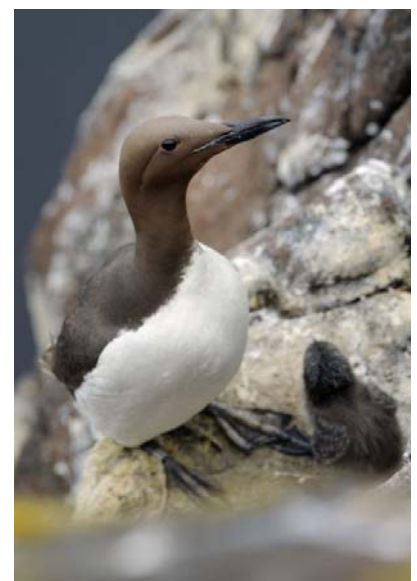


Figure 21: Productivity of guillemots in Scotland (1986 to 2011).



Common guillemot © Lorne Gill SNH

Feeding and Nesting Preferences				Trend and Conservation Status		
Sub-Surface feeder	Inshore feeder	Cliff nester	Flat-ground nester	Stable	Amber	LC
				SCOT	BoCC	IUCN

Black guillemot

Black guillemots breed along the north and west coasts of Scotland. Globally they are a circumpolar breeder (Walton, 2007). They do not migrate, in contrast to the other auk species (such as common guillemot, Atlantic puffin and razorbill) which are migratory. Walton (2007) identified the main threats affecting the population as oil spills, mammalian predators, loss of and damage to kelp beds. The trend for black guillemots has remained relatively stable since monitoring began.

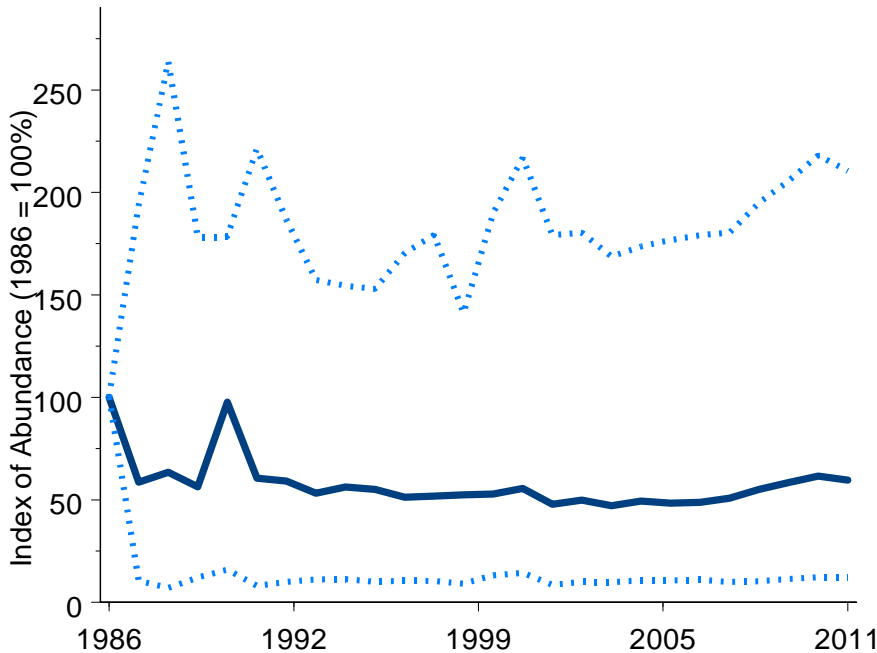


Figure 22. Black guillemot breeding abundance in Scotland (1986 to 2011) with 95% confidence limits (dotted line), and distribution across Scottish SPAs.

No national trend for productivity can be calculated.

As they are not a migratory or European specially-protected species, there are no Special Protection Areas identified for black guillemots. The map (below) shows the distribution of Sites of Special Scientific Interest which list black guillemot as a notified feature.



Black guillemot © Lorne Gill SNH

Figure 23: Black guillemot protected areas in Scotland.

Although the distribution of these sites is around Scotland, the sites do not fully cover the main populations of black guillemots. Plans are underway to introduce a suite of Marine Protected Areas which protect black guillemots. To find out more on the proposals visit:

www.scotland.gov.uk/Resource/0038/00389462.doc

Seabird Indicator for Scotland

Aggregated data are used as an indicator for Scotland's Biodiversity Strategy.

The indicator for 2012 (Figure 24) showed:

- Mean seabird abundance in Scotland has declined since the early 1990s. By 2011 abundance was 47% of the 1986 level; an overall decline of 53%.
- Mean productivity has fluctuated over the period with a decline since 2000. By 2011 productivity was 63% of the 1986 level; an overall decline of 37%.

The indicator can be found at:

www.snh.gov.uk/publications-data-and-research/trends/scotlands-indicators/biodiversity-indicators/biodiversity-state-indicators-list/

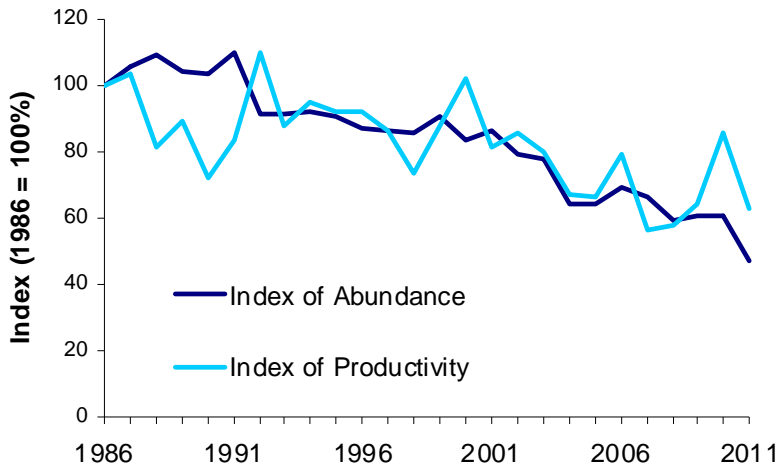


Figure 24: Abundance and Productivity of Breeding Seabirds in Scotland (1986 – 2011).



Black-legged kittiwake © Lorne Gill SNH



Common guillemots, Fowlsheugh NNR © Lorne Gill SNH

What's the order?

Ever wondered why birds are listed in the way they are?

The birds are listed in the order of how evolved they are (the least evolved – closest to their dinosaur cousins – to the most evolved). In 1977 the Dutch Ornithologist K.H. Voous published the familiar format adopted by most bird guides. This list has changed little over the following years. Recent advances in DNA techniques and an improved understanding of birds and their taxonomy has resulted in some recent changes to birds' scientific names and to the accepted order.

The list is always changing as the people whose job it is to classify and group organisms (taxonomists) find new ways to group them. The main thing to remember for birds is geese, swans, waders, seabirds are near the beginning of the list, birds of prey and woodpeckers in the middle with warblers, thrushes, tits and finches towards the end.

About Trend Notes

Trend Notes are factual summaries based on research data relating to trends and changes in our natural heritage, written in a simple, straightforward style. To propose a topic for a Trend Note, please email enquiries@snh.gov.uk.

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