The status of Sanday's breeding seabirds

Spectacular seabird colonies are some of the most iconic scenes in the natural world. The UK hosts many such seabird colonies, which provide breeding sites for over 7 million birds of 25 species, 13 of which are present in internationally important numbers. The northern isles of Scotland have traditionally been a stronghold for many of these species.

Sanday is a large, low lying island located in the north east of Orkney. It is less well known for its seabird populations than other parts of Orkney (for example Marwick and Mull heads on the Mainland, and Noup Head on Westray), but nonetheless it is home to a variety of breeding species. In the south west of the island, cliff nesting species make use of low cliffs and steep coastal banks, and remnant patches of heather moorland support typical moorland birds. Over the rest of the island, the dominant land use is pastoral agriculture, with some fields being used to produce crops for livestock. Species such as Arctic terns can make use of this landscape, and some wilder low lying areas remain, providing habitat for gulls and other ground nesting seabirds. Fulmars nest along coastal stretches and Arctic terns form coastal colonies where beach profiles are suitable.

Data on the numbers of seabirds breeding on Sanday were collected between 6th May and 12th June 2017, using standard count methods described in the Seabird Monitoring Handbook http://jncc.defra.gov.uk/page-2406. Count sites were defined by the Seabird Monitoring Program http://jncc.defra.gov.uk/page-1550, as used during previous surveys on the island as part of national censuses between 1985-88 – the Seabird Colony Register (SCR) and 1998-2002 - Seabird 2000 (S2K). Data from the first national census (Operation seafarer, 1969/70) are excluded from this review as counts for Sanday were not complete. Counts for S2K were carried out in 2000, and counts for SCR were carried out in 1986 and 1987. For SCR data where different sites on Sanday were counted in different years, the counts have been summed to produce SCR island totals.

The data collected in 2017 will contribute to the next national seabird census, Seabirds Count, with further data collection due for 2018. The 2017 data are presented here in comparison with those collected during the two previous national censuses.

Fulmar

On Sanday, fulmar are predominantly found nesting on cliffs, with coastal dunes, open grassland and abandoned buildings also hosting several hundred pairs in 2017. Numbers measured in 'Apparently Occupied Sites' (AOS) increased slightly between SCR and S2K, but then fell slightly between S2K and 2017, a pattern that broadly matches national trends. Fulmar are amber listed by Birds of Conservation Concern (BOCC) due to the large proportion of birds (50 – 60% of the population) breeding at 10 or fewer sites within the UK.

	SCR	S2K	2017
Fulmar AOS	3871	3988	3170

National fulmar trends - http://jncc.defra.gov.uk/page-2868

Shag

Small numbers of shag breed on cliffs and rocky coastlines in the south west of Sanday. The population, counted in 'Apparently Occupied Nests' (AON) has shown a very slight increase between SCR and 2017, which is contrary to national trends. The national breeding population decline has recently seen the addition of shag to the BOCC red list.

	SCR	S2K	2017
Shag AON	31	35	37

National Shag trends - http://jncc.defra.gov.uk/page-2877

Arctic skua

Arctic skua numbers, counted in 'Apparently Occupied Territories' (AOT) on moorland and low lying grasslands have shown a sharp decline over the period between SCR and 2017, and now only breed on Sanday in very small numbers. This mirrors the pattern shown nationally, which has resulted in this species being placed on the BOCC red list.

	SCR	S2K	2017
Arctic skua AOT	43	22	4

National Arctic skua trends - http://jncc.defra.gov.uk/page-2878

Great skua

The number of great skua AOTs on Sanday has remained low throughout the period covered. Great Skua are amber listed due to the large proportion of birds (70 – 80% of the population) breeding at 10 or fewer sites within the UK. The national trend has shown a population increase through the period covered.

	SCR	S2K	2017
Great skua AOT	1	0	1

National great skua trends - http://jncc.defra.gov.uk/page-2879

Black-legged kittiwake

Due to the restricted availability of suitable cliff habitat, numbers of black-legged kittiwake AONs have always been low on Sanday. However, even within this small population, a clear decline has occurred over the period covered. This species is also in long term decline nationally, and this, along with a decline of over 50% within the last 25 years, has resulted in its recent addition

to the BOCC red list. Of note, the entire Sanday kittiwake population moved from its traditional stronghold on the western cliffs to a small section of cliff habitat in the far south west of the island, at some point between S2K and 2017. Anecdotal evidence suggests that this move happened very recently.

	SCR	S2K	2017
Kittiwake AON	192	134	51

National black-legged kittiwake trends - http://jncc.defra.gov.uk/page-2889

Black-headed gull

On Sanday, black-headed and other gull species nest in colonies in areas of low lying grassland, often associated with lochs or wetland areas. Although the numbers of Black-headed gull AONs counted in 2017 show a huge decline from the numbers counted for SCR, it is possible that the S2K figures give a distorted indication of when that decline happened. During S2K, black-headed gull numbers were counted as individuals (possibly to reduce disturbance at difficult to count colonies). For some species, 'conversion factors' have been produced to estimate numbers of AONs from counts of individuals, but there is no conversion factor available for black-headed gull. As such, the data record that 590 individuals were counted at colonies during S2K surveys, but it is not possible to estimate a number of AONs from this count. To put the 590 birds into context, a total of 76 individuals were counted in 2017, in addition to the 10 AONs, and It is therefore likely that the decline in black-headed gull numbers has happened since S2K. This local decline is in stark contrast to the increase shown by the national trend, and highlights the need for another comprehensive census of the UK's breeding seabirds. Black-headed gull is amber listed by BOCC due to declines in the wintering population.

	SCR	S2K	2017
Black-headed gull AON	276	0	10

National black-headed gull trends - http://jncc.defra.gov.uk/page-2882

Common gull

Numbers of common gull AONs have declined on Sanday since S2K, with the 2017 count representing just 55% of the number counted in 2000. Common gull is amber listed in the UK due to the relatively high proportion of wintering birds using fewer than 10 sites (40 – 50%). Data from the forthcoming 'Seabirds Count' census will highlight whether the decline seen on Sanday has also been occurring elsewhere, and what impact this might be having on the national population - at present, there are insufficient data to generate a robust national trend since S2K.

	SCR	S2K	2017
Common gull AON	524	580	319

National common gull trends - http://jncc.defra.gov.uk/page-2883

Lesser black-backed gull

The lesser black-backed gull is another species for which a robust national trend cannot be generated, although it is thought to be in decline as a breeding species over much of its UK distribution. This is the pattern demonstrated by the Sanday population, which has shown a sharp decrease in AONs since SCR. Lesser black-backed gull is amber listed in the UK due to the international importance of the UK breeding population, and the large proportion of birds (70 – 80%) breeding at 10 or fewer sites.

	SCR	S2K	2017
Lesser black-backed gull AON	191	70	16

National lesser black backed gull trends - http://jncc.defra.gov.uk/page-2886

Herring gull

As with lesser black-backed gull, the number of breeding herring gulls on Sanday has fallen markedly since SCR. This is another species for which data are insufficient for robust trend estimation since S2K. In spite of this uncertainty, herring gulls are red listed by BOCC due to both long term declines, and steep shorter term declines of over 50% in a 25-year period. Natural nesting populations are believed to have declined steeply over the period covered, but at present, although it is suspected to be increasing, we do not know the number of urban nesting gulls. A complete census of the UK herring gull population would allow for the generation of accurate and robust trends, and would also inform the changing fortunes of urban and natural nesting populations.

	SCR	S2K	2017
Herring gull AON	779	207	172

National Herring gull trends - http://jncc.defra.gov.uk/page-2887

Great black-backed gull

Like all of the other gull species breeding on Sanday, the great black-backed gull population has shown a marked decline. This species has also declined nationally (although the national trend shows a much less steep decline with some local populations increasing), which has resulted in it being amber listed by BOCC. Again, comprehensive census would help inform the changing status of this species across the UK.

	SCR	S2K	2017
Great black-backed gull AON	448	205	70

National great black-backed gull trend - http://jncc.defra.gov.uk/page-2888

Sandwich tern

The changing status of the Sandwich tern on Sanday can be related to the abundance of birds at single colonies. A total of 27 AONs were estimated from Whitemill Point in 2000, with 12 AONs counted at Elsness for SCR. In 2017, just one pair was estimated at Westayre Loch. Sandwich terns, like other tern species, show large fluctuations in breeding numbers and often shown large scale movements between colonies, making it unwise to infer too much from the Sanday data in isolation. These fluctuations and changes in distribution necessitate national tern census data to be collected during a single breeding season. Previous national censuses have shown that the UK population decreased between SCR and S2K, but SMP data show that the population trend is one of increase since then.

	SCR	S2K	2017
Sandwich tern AON	12	27	1

National sandwich tern trend - http://jncc.defra.gov.uk/page-2890

Common tern

Numbers of common tern breeding on Sanday have been low throughout the period covered, with small numbers being counted in locations with colonies of Arctic tern during the two previous national censuses and in 2017. Common tern are amber listed in the UK as a result of their highly localised population (60 – 70% of all breeders are found at ten or fewer colonies) and have shown a decline nationally since Operation Seafarer in 1969/70.

	SCR	S2K	2017
Common tern AON	7	2	4

National common tern trend - http://jncc.defra.gov.uk/page-2895

Arctic tern

Numbers of Arctic tern AONs on Sanday declined by over 50% between SCR and 2017. The national trend has shown fluctuations since SCR, possibly in relation to sandeel stocks, but overall declines and range reductions have resulted in Arctic tern being amber listed in the UK. Of added concern for this species is anecdotal evidence (Sanday ranger pers comms) of almost total failure of Arctic tern colonies shortly after the surveys were carried out in 2017, with some colonies almost entirely abandoned by mid June. Re-surveying breeding terns on Sanday in 2018 along with the rest of the UK population for the 'Seabirds Count' census will inform to what extent these local declines are replicated at a national level.

	SCR	S2K	2017
Arctic tern	999	781	418

National Arctic tern trend - http://jncc.defra.gov.uk/page-2896

Other species

Other seabird species, such as gannet, Manx shearwater, cormorant, guillemot, puffin, razorbill, little tern, Iceland gull and little gull were recorded in suitable habitat during the surveys but in very low numbers, or with no evidence of breeding taking place. Black guillemot were frequently encountered, but the recommended survey period for this species is in April, which fell outside the dates available for the 2017 surveys.

Discussion

In the majority of cases, (nine of the 13 species covered) populations of breeding seabirds on Sanday have declined since SCR, with six of these showing a reduction of over 50% in this period. Cliff nesting species were generally present in low numbers, showed relatively stable populations or were not proven to be breeding – although kittiwake numbers have dropped by approximately 73% since SCR.

Ground nesting birds appear to have consistently suffered the most dramatic reductions in numbers. In 2017, Arctic tern numbers were down by approximately 68% from those recorded for SCR, although this may be a result of natural fluctuations in population, or birds moving to other colonies. Arctic skua numbers have reduced by approximately 91%, and local declines of this species in the northern isles have previously been attributed to several factors. Habitat loss and competition with great skua have been suggested as causes of decline, but the limited number of great skua present on Sanday, and the availability of unused, apparently suitable habitat indicate that other factors are likely to be at play. Decline in local sandeel stocks, resulting in reduced food availability (both directly in terms of sandeels to kleptoparisitise, and indirectly in terms of the impact on availability of young birds and eggs of other species) is likely to be the biggest driver for the decline. However, Arctic skua can emigrate from one colony to another, so the true extent of the decline can only be known with wider census effort.

Perhaps most concerning are the large declines in the five ground nesting gull species, with the overall reductions in breeding population shown in the table below.

	SCR	2017	% decline
Black-headed gull	276	10	**96.4**
Common gull	524	319	**39.1**
Great black-backed gull	448	70	**84.4**
Herring gull	779	172	**77.9**
Lesser black-backed gull	191	16	**91.6**

Wider causes of population decline in these five species of gull are varied, and include botulism, changes in refuse collection and deposition practices, changes in fisheries and discards practices, habitat change, mammalian predation and human control. The causes of these local declines are currently unknown, however some count sites that had previously held colonies were found to be well maintained farmland with no breeding gulls in 2017, so it is likely that changes in land use have contributed to declines. Local declines on Sanday are not a result of licensed control measures, and wild mammalian predation is unlikely to have a particularly strong impact as well, with a small population of otters being the only native predators. The presence of stoats remains unproven on Sanday, however there are large numbers of feral cats on the island, and a healthy population of ravens, which may account for some predation. Botulism, linked to refuse feeding gulls, and a reduction in food availability due to changes in refuse discard practices are unlikely to have a significant impact as most of Orkney's household refuse is now shipped to Shetland for incineration, having previously been incinerated locally. As such, opportunities for Sanday's gulls to feed on refuse would never have been available at a large scale.

Another possibility is that the local decline represents a redistribution of birds, rather than a reduction. Gulls can respond to certain pressures by moving to more suitable areas, or even changing breeding habitats and habits completely (e.g. the increasing urban roof nesting populations of many species, and the dietary changes that this necessitates).

Answering questions relating to the scale of, and reasons for these declines is particularly important for some species. Data from the S2K census show that Orkney holds a large proportion of the UK population of both common gull (approximately 22%) and great black-backed gull (approximately 28%). If the declines seen on Sanday are replicated across the rest of Orkney, or more widely, the population level consequences could be extremely concerning.

Local scale changes such as those detected on Sanday, or the recent declines highlighted in cliff nesting species on St Kilda by Miles et al, are best contextualised by wider, ideally complete census. Current national population estimates for many species are based on samples rather than complete counts, or on trends informed by small or relatively old datasets. Hence, the forthcoming 'Seabirds Count' census is vitally important to updating our understanding of seabird populations in the UK. Contributions by volunteers counting allocated sites have accounted for a significant proportion of the data collected in the previous censuses, and this will hopefully continue through this census and into the future. For more information on the census, including how to take part, please visit the 'Seabirds Count' pages of the JNCC website. If you're interested in longer term involvement, including more regular voluntary effort, please visit the SMP pages on the JNCC website http://jncc.defra.gov.uk/page-1550 .