



Isles of Scilly Wildlife Trust

Seabird Monitoring & Research Project Isles of Scilly 2019



Surveying for Manx shearwaters on St. Helen's. Photo: Gavin Bloomfield

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Summary of Seabird Monitoring and Research 2019

Monitoring of seabird numbers and productivity on St Agnes and Gugh

- Manx shearwater
 - breeding population has increased from 22 pairs in 2013 (pre- rat eradication) to 69 pairs in 2019 (post rat eradication)
 - Further sub-colony site expansion seen on St. Agnes in 2019
 - 45 'star-gazing' chicks recorded (13 St. Agnes, 32 Gugh), 0.65 chicks per pair
 - no fledging recorded at sub-colony on Bryher; one chick recorded St. Mary's (Penninis) with rat presence
- Storm petrel
 - Recorded breeding successfully St. Agnes & Gugh in 2019 (first records 2015) including a new area on Gugh
 - Cat predation on St Agnes in 2019, minimum 38 adult birds
 - 7 calling chicks recorded in 2018 (5 on Gugh, 2 St. Agnes)
 - 6 storm petrel nest boxes in St. Agnes dry stone walling checked, no uptake
- Lesser black-backed gull
 - colony on Gugh 422 pairs (875 in 2006)
 - Unusually high mortality of adults (Jun) & chicks (Aug) recorded but no source identified
 - productivity ranging from 0.43 to 0.58 chicks per pair

Productivity monitoring work across the archipelago

- Herring gulls: selected sub-colonies on Samson and in Hugh Town, St. Mary's
 - productivity 0.40 chicks per pair on Samson (n = 38)
 - productivity 1.47 chicks per pair Hugh Town rooftop sub-colony (n = 19)
- Kittiwakes: all sub-colonies
 - only bred at one site on the east side of Gugh
 - total 20 pairs, 93% reduction since 2006 (266 pairs, 6 sub-colonies)
 - 1 chick fledged – most chicks lost to peregrine predation
- Fulmars: selected sub-colonies Menawethan (n = 34) and Daymark (n = 53)
 - productivity ranging from 0.38 to 0.53 chicks per pair
- Common terns: all sub-colonies
 - as many as 15 pairs appearing to settle and courtship feed on the western rocks in late June, but no breeding attempts confirmed

Population monitoring work on Annet

- Puffins 42 birds recorded (31 in 2015, 50 in 2006, 43 in 2019)
- Storm petrel continued increase in breeding numbers at southern study beach 2006-2018
- Sample area surveyed for Manx shearwaters, 30 AOBs recorded
- Shag and greater black-backed gull numbers increased by >15% (to 103 & 199 pairs respectively)

Introduction - Isles of Scilly Seabird Heritage & Data set

The full Special Protection Area (SPA) count conducted in 2015/16 confirmed Scilly as supporting a greater diversity of seabirds than any other site in England, with over 8,000 pairs of 13 species of regularly breeding seabird. Seabirds are a named feature in the SPA and many of the SSSI designations for the area and are a vitally important part of our natural heritage. We have;

- Internationally important numbers of lesser black-backed gull and storm petrel
- Nationally important numbers of great black-backed gull, Manx shearwater and shag (possibly now the largest colony in the UK)
- Regionally important numbers of puffin, razorbill, common tern and fulmar
- One of only two sites in England where Manx shearwater and storm petrel breed (the other being Lundy).

Scilly's seabird breeding records comprise one of the best long term environmental data sets we have for the islands. Regular all-island counts have been completed since 1970 as well as annual records for breeding numbers on Annet since 2006 and for St Agnes and Gugh since 2012. Sadly these records have documented alarming declines in many of our seabird populations;

- Overall number of breeding seabird pairs declined by 9.8% since 2006 and by 31.3% since 1983
- Five species of seabird have declined in numbers across Scilly by more than 20% since 2006 (kittiwake 89%; common tern 65%; lesser black-backed gull 26%; herring gull 22%; shag 21%)
- Annual counts of Annet breeding numbers down by 47% since 2006 (mainly a reduction in shag, lesser black-backed and herring gull numbers)

Birds are widely accepted as excellent indicators of environmental health; their changing populations often providing clues to the overall health of their habitat. These declines in the seabird populations of Scilly show that there is a clear need to take action. Measurement of variables over time in a systematic way informs management priorities and actions for maintaining and recovering our seabird populations. Annual counts are particularly important in the variable marine environment where isolated good or bad years can have a big impact, but also need to be analysed in the context of the long-lived seabirds' life history. Continuous data sets allow a much more useful picture of what is going on between the stark numbers of the periodic full SPA counts.

The data collected in Scilly also contributes to national seabird records and allows comparison between different regional populations. In particular Scilly provides a useful comparison site for many seabird species whose other more studied colonies are located in the North Sea e.g. Kittiwake, shag, storm petrel. Unbroken long-term data sets also provides us with a reliable baseline measure against which to compare the impact of any unexpected isolated events (e.g. Pollution, disease, wrecks)

The scope of this report

Since the full SPA survey in 2006 annual productivity data for key seabird species have been collected at key sites across the islands. This is building up a picture of various breeding successes and failures to add to the picture in the interim periods between full counts and helping us to get an idea of the causes of the major species trends observed. Productivity for the species recorded here were collected using standard methods as set out in *The Seabird Monitoring Handbook* (Walsh *et al.* 1995). This report summarises the results of this seabird fieldwork conducted between April and September 2019 and was funded by the Isles of Scilly Wildlife Trust through the Area of Outstanding Natural Beauty programme.

Results: Monitoring of seabird numbers and productivity on St Agnes and Gugh

A full survey of all seabird species breeding on St. Agnes and Gugh has been conducted annually since 2012 with the results from this and the two previous SPA counts included in Tables 1 and 2 below. Over this period the number of both herring and lesser black-backed gulls has decreased. Kittiwakes first bred on St. Agnes at the Turks Head in 2009 following the desertion of a number of sub-colonies elsewhere in the archipelago. After two years of failure at this site a small number of birds returned have returned to breed at their former site on the eastern side of Gugh in the last 3 years. The biggest change since the removal of rats in the winter of 2013/14 has been the increase in breeding numbers, productivity and range of Manx shearwaters and the first recording in living memory of storm petrels breeding, now annually, on St. Agnes since 2015 and on Gugh since 2016.

Table 1. Breeding seabirds on St. Agnes*

	FUL	MX	SH	LBBG	HG	GBBG	KIT	COT	SP	RPL	OYC	Total
2000	0	5	0	2	25	0	0	3	0	-	-	35
2006	0	8	0	0	15	1	0	0	0	-	-	24
2012	0	8	0	8	61	0	24	0	-	2	9	112
2013	2	5	0	8	32	0	38	0	0	1	8	94
Rat Removal												
2014	3	9	0	16	27	1	62	0	0	1	10	129
2015	4	12	0	14	11	1	75	0	6	1	7	131
2016	6	22	0	15	12	1	5	0	9	2	8	80
2017	8	23	0	1	7	0	0	0	11	2	10	62
2018	5	23	0	2	7	0	0	0	8	1	7	53
2019	6	27	0	1	8	0	0	0	2	0	6	50

SH – shag; GBBG – great black-backed gull; LBBG – lesser black-backed gull; HG – herring gull; RAZ – razorbill; FUL – fulmar; KIT – kittiwake; COT – common tern; SP – storm petrel; MX – Manx shearwater; PUF – puffin; OYC – oystercatcher; RPL – ringed plover.

* Counts do not include Burnt Island and Tins Walbert (connected to St. Agnes at low tide)

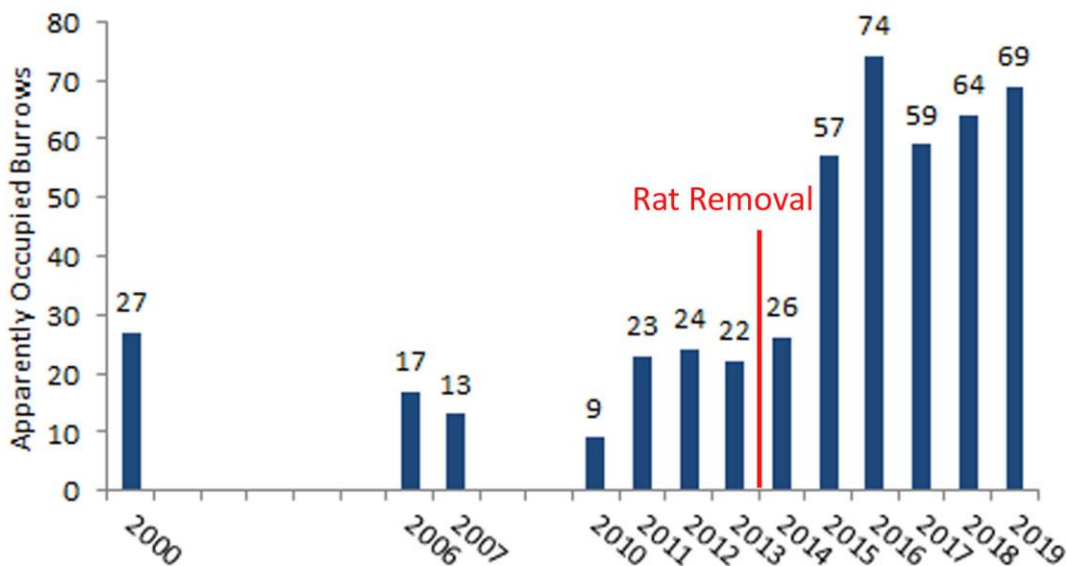
Table 2. Breeding seabirds on Gugh

	FUL	MX	SH	LBBG	HG	GBBG	KIT	COT	SP	RPI	OYC	Total
2000	2	22	0	1123	159	3	155	0	0	-	-	1464
2006	3	9	0	875	69	4	131	0	0	-	-	1091
2012	4	16	2	361	53	10	0	0	-	0	7	453
2013	1	17	0	418	51	7	0	0	0	0	10	504
Rat Removal												
2014	5	17	0	411	30	5	0	0	0	0	10	478
2015	1	45	0	419	30	6	0	0	2	1	5	509
2016	1	52	0	400	36	5	0	0	4	0	10	508
2017	3	36	2	296	20	2	30	0	5	0	9	403
2018	2	41	0	452	28	0	35	0	11	1	9	579
2019	2	42	1	422	14	3	20	0	11	0	9	524

Manx shearwater settlement and productivity

The numbers of apparently occupied Manx shearwater burrows on both St. Agnes and Gugh have increased dramatically since the removal of rats in the winter of 2013-4. In addition to the increase in breeding numbers, new burrows are being occupied year on year with the sub-colony at Troytown/ Castella Down St Agnes spreading towards Long Point in 2019.

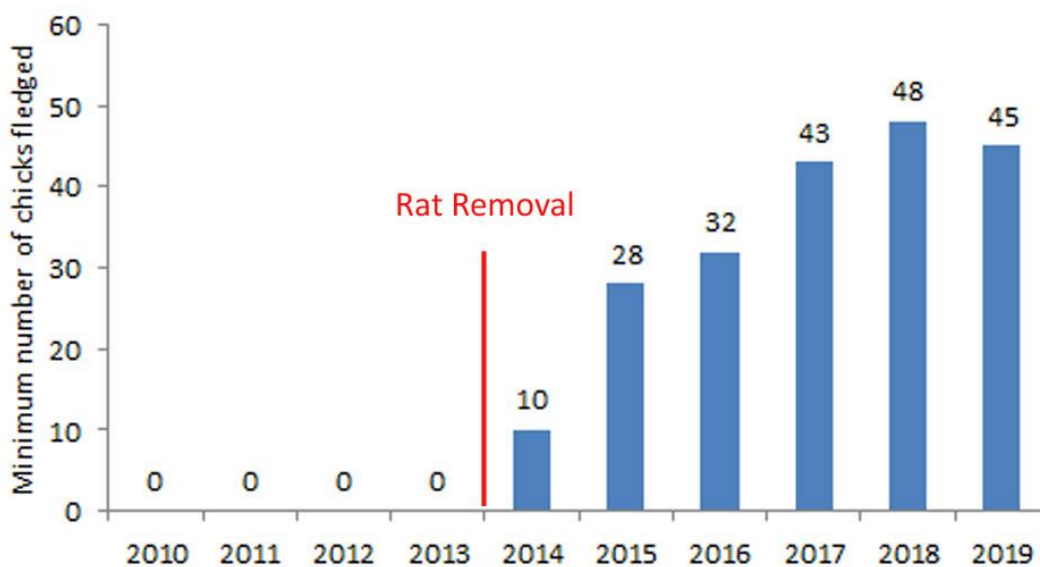
Manx Shearwater numbers St Agnes & Gugh



Breeding Success

In 2019 evening checks between August and late-September recorded 45 ‘star-gazing chicks’ across St Agnes and Gugh (13 on St Agnes and 32 on Gugh). This is a similar number to 2018 and translates to a breeding success of 0.65 chicks per Apparently Occupied Burrow. This is similar to the breeding success on Lundy after rat removal recorded at 0.62 to 0.80 chicks per pair and the National Average 1986-2015 at 0.66.

Manx shearwater breeding success St Agnes & Gugh



Manx shearwaters elsewhere across the islands

In 2015/16 to total number of Manx shearwaters breeding across the isles of Scilly was estimated at 523 pairs, with many of these birds attempting to breed at sites with continued rat presence. Counts of these birds have been made annually at the more accessible sites and the results are presented in Table 4 below.

A number of evening checks were made in August and September 2019 around the areas of Penninis, St Marys and Shipman Head Down on Bryher. As in previous years, no fledglings were recorded with a number of nocturnally active rats being sighted in and around the burrows at Shipman Head. At Peninnis, one star-gazing chick was recorded in mid-September with an adult bird still coming in to feed it. It seems likely that these populations are being maintained at a low level only by immigration either from other rate free islands in Scilly or further afield.

Table 4. Manx shearwater breeding numbers – selected counts across Scilly

	Gugh	St. Agnes	Bryher	St. Helen's	Peninnis, St. Mary's	Annet	Tresco	Daymark, St. Martin's
Rats present?	No	No	Yes	Yes	Yes	No	Yes	Yes
2000	22	5	12	5	0	123	0	0
2006	9	8	13	9	0	-	0	0
2007	8	5	-	-	-	-	-	-
2010	6*	3*	-	-	4	-	-	-
2011	13	10	-	39	7	-	-	-
2012	16	8	-	-	4	-	-	-
2013	17	5	12	-	2	(21)	-	-
2014	17	9	12	27	4	(20)	-	-
2015	45	12	39	36	8	229	46	26
2016	52	22	(16)	42	7	-	-	(4)
2017	36	23	(16)	-	4	-	(28)	(3)
2018	41	23	(23)	49	5	(30)	(27)	(0)
2019	42	27	(25)	56	1	(30)	(32)	-

*AOBs recorded mid-June, likely to be an underestimate; Numbers in brackets represent only a sample of total; Dash means no count. All breeding pair counts above include a correction of 1.08 to account for incubating birds that did not respond.

Storm petrel settlement and productivity

Since the storm petrels' return as a breeding bird to St Agnes & Gugh in 2015, numbers have been increasing, with as many as 20 apparently occupied sites estimated from diurnal playback on St Agnes and Gugh in 2018. In 2019, although an estimated 11 pairs bred again on Gugh and birds were discovered in a new section of boulder beach on the North end by Tol Tuppens, there was a decline in the number of birds found on St Agnes.

In early July, during the peak incubation period for storm petrels, a large number of wings and feet from predated adults were found in a pile next to the main section of the boulder beach breeding colony at Castella Down. A camera trap was deployed to try to discover the culprit and over the next few weeks more remains were found including a leg with a ring from an adult ringed earlier in the month in Cornwall.¹ Eventually footage of a tabby cat was captured showing it actively hunting and eating the

¹ Ring number 2754657 ringed as an adult at Gwenapp Head, Cornwall 6th July and found dead St Agnes 30th July 2019.

birds. In total the remains from a minimum of 38 adult birds were collected – representing the entire estimated adult breeding population at that site. Accordingly, only 1 storm petrel reply was obtained from an apparently occupied site at Castella Down in early July and it is likely that this pair were also subsequently lost.

Storm petrel chicks do not stargaze like shearwater fledglings, but they do call noisily from their burrows towards the end of their fledgling period allowing confirmation of successful breeding. Fledglings have been heard cheeping and whistling from beneath the rocks on calm dark nights each year in late August and through September since 2015 and in 2019 a total of 7 chicks were heard (2 on St Agnes, 7 on Gugh).

Predated remains collected on 9th July at Castella Down and the tabby cat recorded night hunting there



Lesser black-backed gull productivity

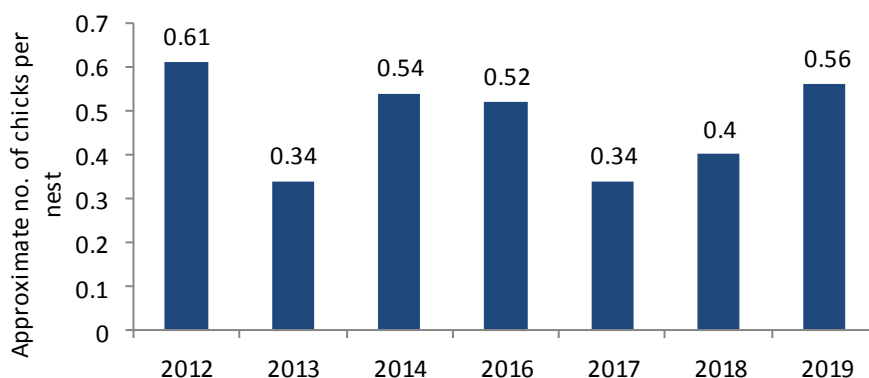
The number of lesser black-backed gulls breeding in Scilly has fallen dramatically in recent years, with a decline of 26% between 2006 and 2015 to just under 2,500 breeding pairs (Heaney & St. Pierre 2017). The majority of the birds in Scilly now breed in three main sub-colonies; Samson, St. Helen's and Gugh. Since 2012 the numbers and productivity at the Gugh sub-colony, where breeding numbers have halved since 2006, have been recorded annually (see below). Fledging success estimated by observing nests from a vantage point above the colony suggests a fledging success in 2019 higher than the last few years, ranging from 0.43 to 0.58 chicks per pair.

Table 5. Lesser black-backed gull productivity on Gugh

Year	LBBG	Productivity Estimates
2012	361	Approx. 180 chicks fledged from 262 nests South Col top colony (0.69 ch/pr); minimum 19 chicks fledged from 65 nests lower rocks colony Cuckold's Carn (0.29 ch/pr).
2013	418	Minimum 103 chicks fledged from 355 nests South Col top colony (0.29 ch/pr)*; minimum 32 chicks fledged from 48 nests lower rocks colony Cuckold's Carn (0.67 ch/pr).
2014	411	Approx. 185 chicks fledged from 325 nests South Col top colony (0.57 ch/pr); minimum 28 chicks fledged from 70 nests lower rocks colony Cuckolds Carn (0.40 ch/pr)
2016	400	Approx. 182 chicks fledged from 359 nests South Col top colony (0.51 ch/pr); minimum 24 chicks fledged from 40 nests lower rocks colony Cuckolds Carn (0.60 ch/pr)
2017	296	Approx. 79 chicks fledged from 249 nests South Col top colony (0.32 ch/pr)*; maximum 21 chicks fledged from 44 nests lower rocks colony Cuckolds Carn (0.48 ch/pr)
2018	452	Approx. 147 chicks fledged from 384 nests South Col top colony (0.38 ch/pr); minimum 22 chicks fledged from 44 nests lower rocks colony Cuckolds Carn (0.50 ch/pr)
2019	422	Approx. 216 chicks fledged from 376 nests South Col top colony (0.58 ch/pr); minimum 17 chicks fledged from 40 nests lower rocks colony Cuckolds Carn (0.43 ch/pr)

* High vegetation means this count was probably an under-estimate

Lesser black-backed gull productivity on Gugh



Although 2019 was apparently a relatively good year for the gulls on Gugh both in terms of numbers breeding and fledging success, the colony appeared to suffer two distinct mortality events. Firstly on the 8th of June an unusually large number of adult carcasses (30+ birds) were found near the centre of the main Gugh colony (see pictures). Most looked a week or so old, although a couple were more recent and appeared to have been 'shaken'. This can be a feature of a great blacked gull kill or that of a larger

mammal. Cameras were deployed and monitored at the site for the rest of the month and until the end of July, but no further kills or footage of any predators other than crows and greater black-backs in the colony were recorded.

Subsequently on the 12th August, 17 juvenile lesser black-backed gull carcasses were recorded along the path at the edge of the main colony. All appeared to be relatively recent and a number were just wings and a picked clean breastbone, suggestive of a peregrine kill (see pictures). Again a couple of trail cameras were deployed in the area and monitored until the end of September. However, no further carcasses were found and no nocturnal activity other than juvenile gulls, grazing rabbits and feeding oystercatchers were recorded.



Above distribution of adult carcasses found 8th June 2019 on Gugh.



Above left adult gull carcass June 2019; above right juvenile gull remains August 2019

Although death is a constant feature at seabird colonies and carcasses not uncommon, the number of deaths in these two apparently discrete episodes at the Gugh lesser black-back colony is unusual. However, at this point we are none the wiser as to what the cause may have been.

Herring gull productivity

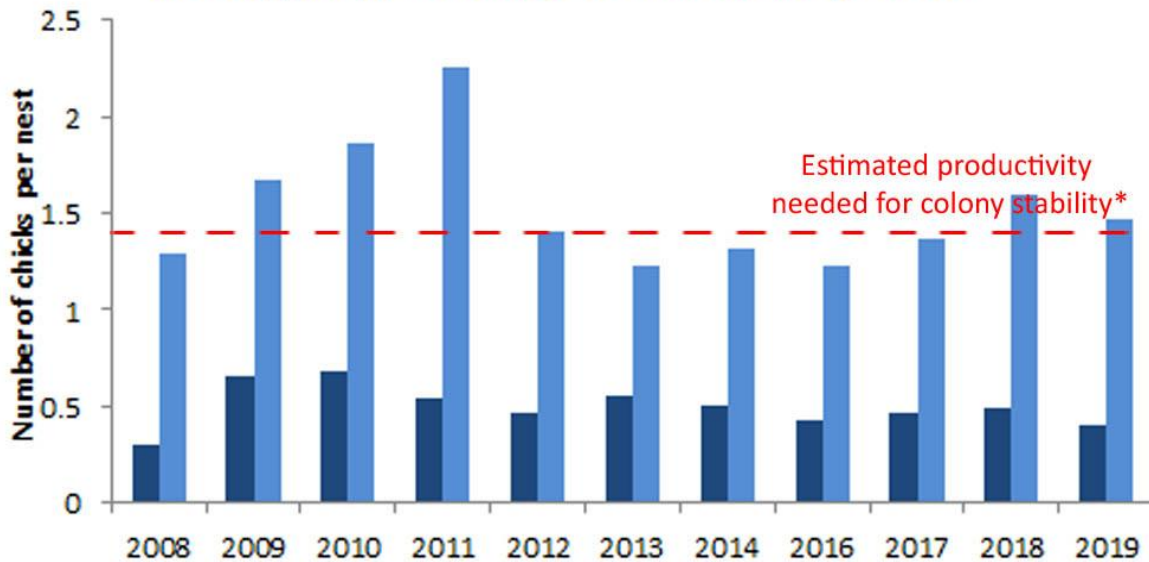
In 2015 herring gulls were red-listed as a species of conservation concern due to recent declines in numbers nationally (estimated 72% loss of abundance between 1969 and 2014, JNCC 2015). Breeding numbers across Scilly of this species have been falling at a similarly rapid rate with a decline of 22% between 2006 and 2015/6 to just 556 pairs (Heaney & St. Pierre 2017). Since 2008 the productivity of herring gulls at three sub-colonies on St. Marys, Tresco (now deserted) and Samson has been recorded by observing minimum fledging success at mapped nests. The results are presented below.

Over the years of this study the small roof-top colony in Hugh Town, which presumably relies on more anthropomorphic food sources than those on Samson, has fared consistently better. Whilst the absolute number of birds nesting on the study beaches on Samson has declined, the number of birds in town, although low, has been increasing. The fledging success in Hugh Town is also substantially higher and well above that needed for colony stability, thus potentially fuelling growth. Unfortunately the gulls nesting in town are not universally welcomed and the amount of suitable undisturbed roof space very limited.

Table 6. Herring gull productivity estimates

Year	Gimble Porth	Samson	Hugh Town
2008	0.48 (<i>n</i> =50)	0.30 (<i>n</i> =84)	1.29 (<i>n</i> =7)
2009	0 (<i>n</i> =41)	0.66 (<i>n</i> =73)	1.67 (<i>n</i> =6)
2010	0 (<i>n</i> =17)	0.68 (<i>n</i> =63)	1.86 (<i>n</i> =7)
2011	0 (<i>n</i> =9)	0.54 (<i>n</i> =71)	2.25 (<i>n</i> =8)
2012	0 (<i>n</i> = 3)	0.46 (<i>n</i> =56)	1.4 (<i>n</i> = 10)
2013	0 (<i>n</i> =2)	0.56 (<i>n</i> =55)	1.22 (<i>n</i> =9)
2014	Deserted	0.50 (<i>n</i> =34)	1.31 (<i>n</i> =13)
2015	Deserted	(<i>n</i> =56)	(<i>n</i> =14)
2016	Deserted	0.43 (<i>n</i> =53)	1.22 (<i>n</i> =9)
2017	Deserted	0.46 (<i>n</i> =44)	1.44 (<i>n</i> =16)
2018	Deserted	0.49 (<i>n</i> =37)	1.60 (<i>n</i> =20)
2019	Deserted	0.40 (<i>n</i> =38)	1.47 (<i>n</i> =19)

Herring gull productivity on Samson & Hugh Town



KEY: Samson dark blue; Hugh Town light blue. No productivity recorded in 2015.

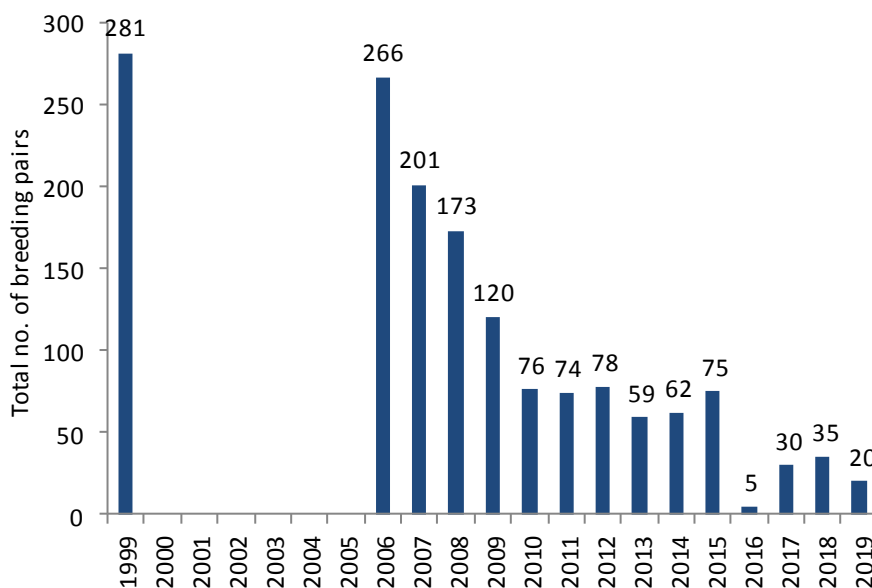
*Cook and Robinson (2010) estimate that an average productivity of 1.3-1.5 chicks per pair per year is needed for colony stability.

Kittiwakes across Scilly

Breeding numbers

All kittiwake sub-colonies across Scilly have been counted annually since 2006. Over this period dramatic declines have been recorded; 93% drop in numbers, loss of 5 sub-colonies and total breeding failure in 7 of the last 14 years. In the last six years only one sub-colony site has been occupied by all of the remaining birds (below the Turk's Head at St Agnes 2014-16 and then Gugh 2017-19). At no time in this study has the productivity of the kittiwakes in Scilly approached the level of 1.5 chicks per pair per year, estimated to be needed for colony stability (Cook & Robinson 2010).

Kittiwake breeding numbers in Scilly



* Breeding numbers not recorded in the years 2000 to 2005.

Productivity

In 2019 just 20 pairs of kittiwakes nested in Scilly, all on the low ram cliffs on the East side of Gugh. From the last week of April a camera, supplied by Dr. Tom Hart of the Oxford University Seabird Watch team, was deployed on the kittiwake colony. This camera was set up to take a picture every minute, giving an idea of the breeding phenology and success at the site. Despite the small numbers of birds at the colony they appeared initially to do well with adult attendance at the nests sites high and the first newly hatched chick seen on 19th June. The small colony was not very synchronous however with large chicks as well as newly hatched and some pairs still on eggs being recorded in mid-July when the nests started to fail.



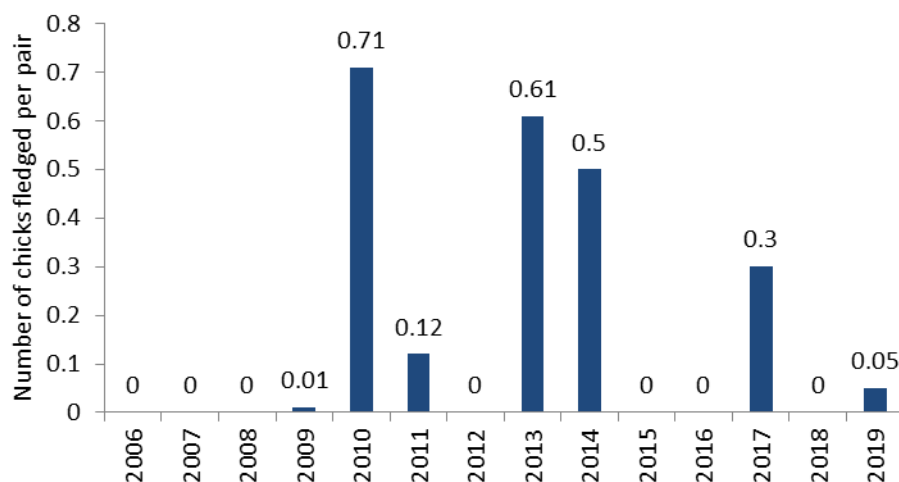
Kittiwake and Herring gull combine forces to see off a crow

Analysis of the camera footage reveals repeated visits over a one week period from 9th to 15th July, and systematic predation of the kittiwake chicks by a peregrine falcon to be the explanation. It appears that one chick escaped the peregrines attention and was able to fledge in late July, giving a breeding success of just 0.05 chicks per pair.



Peregrine at the Gugh nest ledges (photo enhanced to highlight peregrine by Nikki Banfield)

Kittiwake breeding success in Scilly



Fulmar productivity

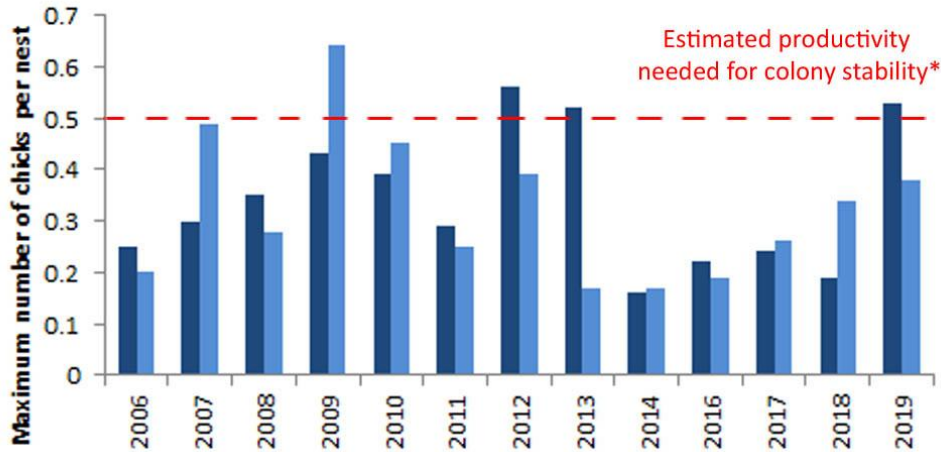
Since 2006 two of the main discrete cliff-side fulmar sub-colonies, those on Menawethan and the Daymark St. Martin's, have been monitored from the sea. The numbers settling at the two sites have been fairly consistent over this time but the fledging success quite variable (see Table 7). In general it has been lower than the level needed to sustain the population (Cook & Robinson 2010) and this will go some way to explaining the recent slowing of population growth across Scilly. However there is some evidence of a reversal of this trend with fledging success starting to increase again from an overall low in 2014. Across the UK the mean productivity recorded for fulmars between 1986 and 2008 was 0.39 chicks per pair per year, declining at a rate of 0.005 ch/pr/yr.

Table 7. Fulmar productivity estimates

	Menawethan	Daymark	Total
2006	0.25 (<i>n</i> = 44)	0.20 (<i>n</i> = 46)	90
2007	0.30 (<i>n</i> = 41)	0.49 (<i>n</i> = 45)	86
2008	0.35 (<i>n</i> = 37)	0.28 (<i>n</i> = 46)	83
2009	0.43 (<i>n</i> = 33)	0.64 (<i>n</i> = 36)	69
2010	0.39 (<i>n</i> = 30)	0.45 (<i>n</i> = 51)	81
2011	0.29 (<i>n</i> = 24)	0.25 (<i>n</i> = 49)	73
2012	0.56 (<i>n</i> = 25)	0.39 (<i>n</i> = 59)	84
2013	0.52 (<i>n</i> = 27)	0.17 (<i>n</i> = 54)	81
2014	0.16 (<i>n</i> = 44)	0.17 (<i>n</i> = 52)	96
2015*	(<i>n</i> = 43)	(<i>n</i> = 46)	89
2016	0.22 (<i>n</i> = 45)	0.19 (<i>n</i> = 57)	102
2017	0.24 (<i>n</i> = 34)	0.26 (<i>n</i> = 54)	98
2018	0.19 (<i>n</i> = 33)	0.34 (<i>n</i> = 50)	83
2019	0.53 (<i>n</i> = 34)	0.38 (<i>n</i> = 53)	87

*Productivity not recorded in 2015

Fulmar productivity in Scilly



KEY: Dark blue Menawethan, light blue Daymark.

*Cook and Robinson (2010) estimate that an average productivity of 0.5 chicks per pair per year is needed for colony stability in fulmars. Productivity not recorded in 2015.

Common tern breeding numbers and productivity

Following a maximum count of 210 breeding pairs in 1983, the number of common terns breeding in Scilly has been in rapid decline (Heaney & St. Pierre 2017). Alongside this steep decline in numbers of terns returning to breed each year, the birds have suffered repeated low success or total breeding failure. In a number of seasons this has been due to their repeated choice of the low-lying Green Island, where high tides often swamp the colony resulting in egg and chick loss.

In recent years the terns have been very late to return to the islands and show any interest in breeding, with hatching observed well into July in both 2016 and 2017. Although in both these years a few chicks fledged, numbers were low and the lateness likely to affect post-fledging survival adversely. In 2019, as in 2018 low numbers of common terns were recorded around the islands and despite as many as 15 pairs appearing to settle and courtship feed on the western rocks in late June, no breeding attempts could be confirmed.

Common tern breeding numbers in Scilly

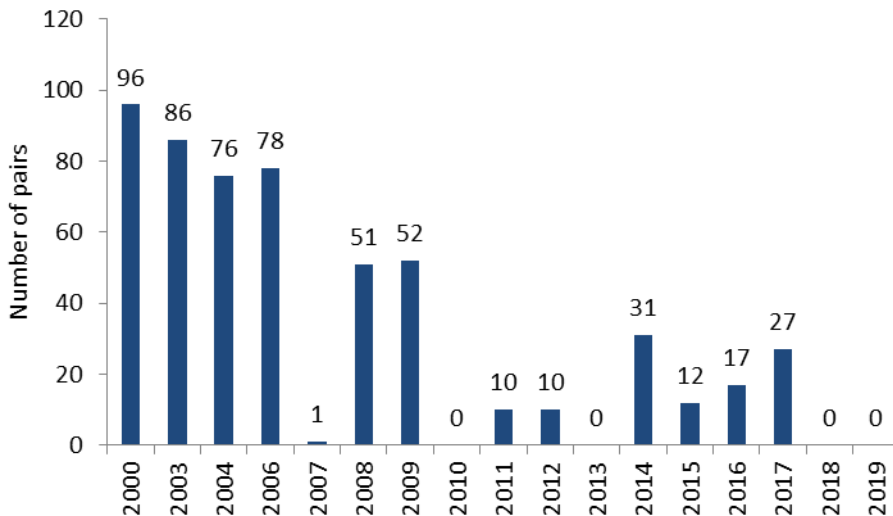
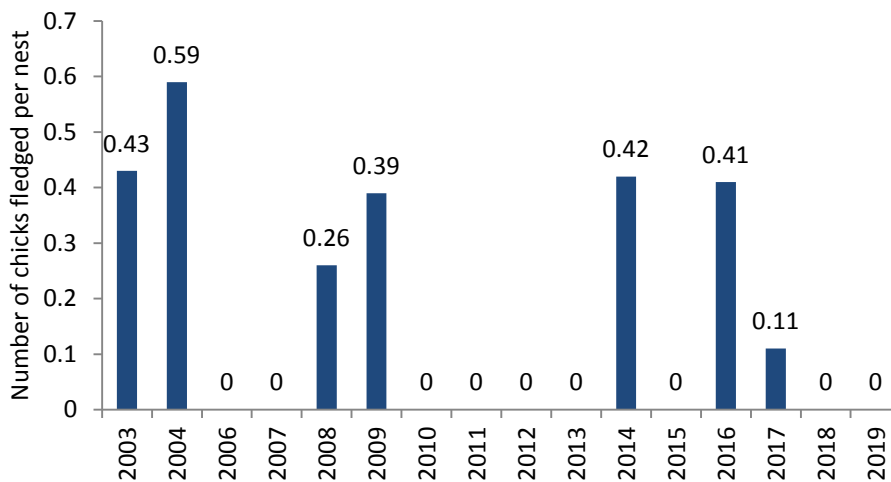


Table 8. Common tern productivity estimates

Year	Productivity	Notes
2003	0.43 ($n = 86$)	Appletree Bank Tresco, Samson and Annet
2004	0.59 ($n = 76$)	Majority of nests on North Hill, Samson
2006	0 ($n = 78$)	Young inundated by storm tide, Green Island
2007	0 ($n = 1$)	Only one breeding attempt recorded, Annet
2008	0.26 ($n = 51$)	Green Is. 41 nests; Peasehopper 10 nests
2009	0.39 ($n = 52$)	Green Is. 51 nests; Annet 1 nest
2010	0 ($n = 0$)	Birds settling on Green Is. But site abandoned before laying
2011	0 ($n = 10+$)	Late settlement, then Green Is. Site inundated by storm tide
2012	0 ($n \leq 10$)	Late settlement, some eggs lost to storm tide Green Island
2013	0	No breeding attempts recorded
2014	0.42 ($n = 31$)	3 chicks from 12 nests Green Is.; 10 from 19 North Hill Samson
2015	0 ($n = 12$)	2 Annet; 10 Samson (failed early egg stage)
2016	0.41 ($n = 17$)	South end Annet very late settling; also 3 newly fledged chicks seen Merrick Island
2017	0.11 ($n = 27$)	South end Annet extremely late settling again
2018	0	Very few common terns returned to Scilly at all in 2018; 10 or so birds showed some interest in the South end Annet again in late May but no eggs were found.
2019	0	≤ 15 pairs appeared to settle and courtship feed on the western rocks in late June, but no breeding attempts confirmed

Common tern productivity in Scilly



Annual count of breeding seabirds on Annet

A count of the seabirds breeding on Annet has been made in most years since 2000 (see Table 9 - no counts were made in 2001 & 2005). This annual count concentrates mainly on the numbers of gulls and shags. Oystercatchers and ringed plovers are counted, and more recently burrow nesters have been included – puffins since 2018 and study sample areas for storm petrels and Manx shearwaters since 2015 and 2018 respectively.

These regular counts document an overall decline in the number of shags nesting on Annet which is mirrored across the rest of the islands (Heaney & St. Pierre 2017). However, the last two years suggest a slight reversal of this trend, with both shag and greater black-backed gull numbers increasing by over 15% in 2019 compared to 2018. As elsewhere the number of small gulls has declined. In particular, the sub-colony of lesser black-backed gulls which numbered 517 in 2000 is now deserted. The number of Great black-backed gulls, although high as a percentage of the overall assemblage on Annet, is still less than half the peak at c.400 pairs for this species on the island before they were controlled by JNCC in the late 1970s.

Table 9. Breeding seabirds on Annet; a dash indicates that no count was made.

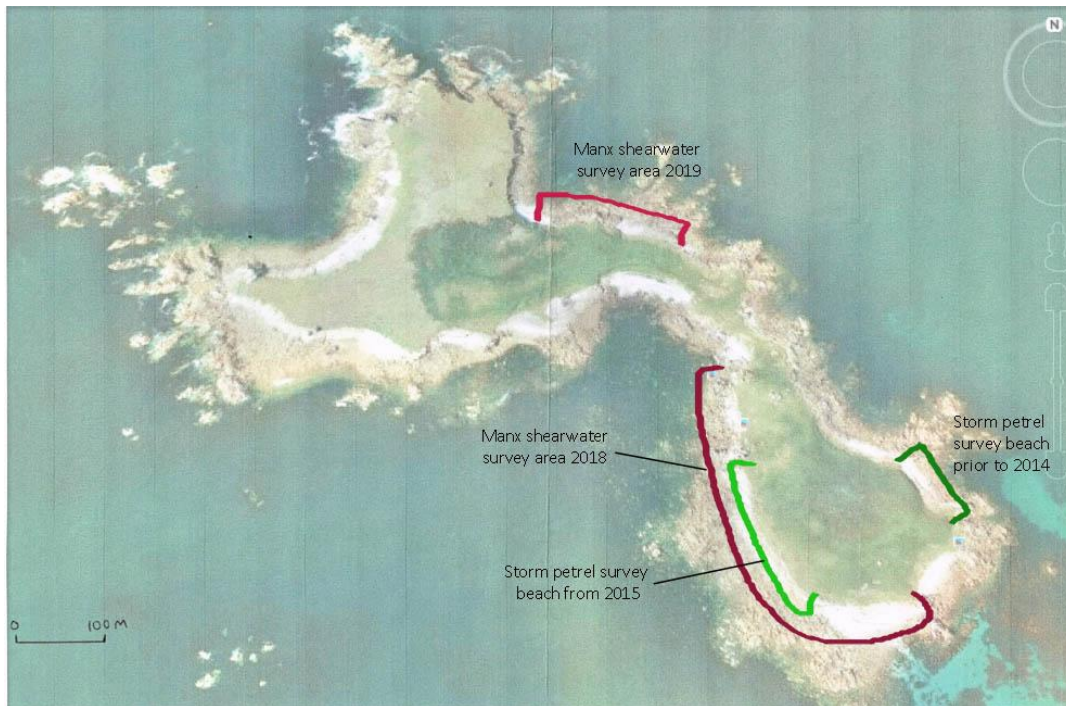
Year	SH	GBBG	LBBG	HG	RAZ	FUL	COT	SP*	MX*	PUF	OYC	RPL
2000	209	137	517	42	4	21	1	938	123	47	-	-
2001	-	-	-	-	-	-	-	-	-	-	-	-
2002	-	171	215	7	4	-	-	-	-	-	-	-
2003	150	164	18	17	0	45	0	-	-	-	-	-
2004	159	197	7	32	2	44	0	-	-	-	5	0
2005	-	-	-	-	-	-	-	-	-	-	-	-
2006	177	187	281	24	4	37	0	788	89	50	-	-
2007	140	88	0	5	1	37	0	-	-	-	5	0
2008	164	47	(5)	4	3	48	0	-	-	-	6	0
2009	154	168	54	7	7	43	0	-	-	-	6	0
2010	198	213	76	11	2	40	0	-	-	-	7	1
2011	115	180	27	5	4	37	0	-	-	-	4	2
2012	107	177	32	8	2	49	0	-	-	-	-	-
2013	99	208	6	4	1	36	0	-	-	-	5	0
2014	96	205	10	5	1	38	0	-	-	-	9	1
2015	85	235	1	20	5	57	2	778	229	31	6	0
2016	86	215	1	16	6	41	14	(106)	-	-	4	1
2017	74	222	7	12	5	41	27	(132)	-	-	7	1
2018	81	170	6	19	0	46	0	(175)	(30)	43	8	0
2019	103	199	19	10	2	46	0	(338)	(30)	42	4	0

*Counts in brackets represent only a sample of the total breeding population on Annet.

Manx shearwater sample survey

An initial sample area for Manx shearwaters (to include both cairn, grass and thrift habitat) between Carn Windlass and South Carn was selected and surveyed in 2018. However, in 2019 a peregrine pair that had previously bred out at Minmanueth raised a single chick at ground level in the rocks at Carn Windless. Although permission was sought and granted from Natural England to complete the planned annual counts, in order to keep disturbance of the breeding falcons to a minimum, the shearwater

survey area selected in 2018 had to be abandoned. In 2019 an alternative area was selected running along the coast and 10m in land from just North of the Neck to the midpoint of North East Porth (see map below). It is hoped that this sample site can be surveyed in subsequent years without adversely impacting the peregrines should they chose to nest at Carn Windlass again in 2020.



Storm petrel study beach on Annet

Between 2010 and 2014 the number of Apparently Occupied Sites at a study beach between Smith’s Carn and Minmow on the south end of Annet was recorded annually using diurnal tape-playback. Unfortunately, this boulder beach was totally destroyed by storms in February 2014. A new study beach running between South Carn and Carn Windlass was identified in 2016 (see map above) and results from this are presented below along with the previous SPA counts for this area from 2000, 2006 and 2015. Although confidence intervals on playback survey results are relatively large due to low response rates, these counts suggest a significant and sustained increase in storm petrel numbers on Annet.

Table 10. Storm petrel numbers at Annet study beach

Year	Number AOSs	Notes
2000	109 (±)	38 responses x 2.86
2006	87	31 responses x 2.86
2015	92	32 responses x 2.86
2016	106	37 responses x 2.86
2017	132	46 responses x 2.86
2018	175	61 responses x 2.86
2019	338	118 responses x 2.86

Discussion

The productivity monitoring and breeding numbers presented in this report show as ever mixed fortunes for the seabirds of Scilly and a number of often complex and in many cases inter-related factors are likely to be contributing to the breeding successes and failures recorded. The numbers of breeding shags on Annet increased by over a quarter in 2019 compared to recent years and fulmars and lesser black-backed gulls managed greater productivity than in the last few years as well; suggesting that this may have been a year of relatively good food supply. However, the terns failed to settle again this year and the kittiwakes all but failed, with just 20 nesting attempts resulting in one fledged chick. The size of the kittiwake colony has in recent years reduced so much that the benefits of collective defence are hardly possible. However, remote cameras in 2019 recorded that, rather than the usually suspected gulls or crows, a peregrine falcon was the reason for disappearing chicks on Gugh.

Lesser black backed gulls

A couple of unexplained mortality events were recorded at the lesser black backed gull colony on Gugh this year and despite subsequent monitoring with cameras traps no cause was identified. The islands are increasingly being marketed as a dog-friendly destination and increasing numbers of residents own dogs. Although the majority of owners are responsible and keep their dog under control, there is always a concern that dogs that are not on a lead or under control can cause much disturbance and damage on uninhabited islands with ground and burrow nesting seabirds. Although there was no evidence to put a dog in the frame on Gugh, because of issues in the past here with shearwater burrows being dug up, the opportunity was taken to raise awareness of the issue on social media and to place signage around the south end of the island this season (see picture). Concerns were also raised with the Environmental Health Officer at the IOS Council and the Trust contributed to wider discussions with the Council, the Police and the Islands Partnership on this issue.



Manx shearwaters

Numerous studies have documented the overwhelmingly positive effect that clearance of rats from islands has on burrow nesting seabirds and the maintenance of rat free status on St Agnes and Gugh continues to be a leading move for seabird conservation in Scilly. The populations of burrow nesters there are increasing year on year in both numbers and breeding success following rat removal in 2014. Five years being rat free is still a relatively short time to assess changes in seabird breeding populations. With the typical age at first breeding of Manx shearwaters at six years (Brooke 1990), the increases so

far can only be explained by immigration of birds reared at other nearby colonies (e.g. Lundy, Skomer, Skokholm) as well as birds reared elsewhere in Scilly (e.g. Annet, Round Island). Prospecting birds will be encouraged to settle by the successful breeding now seen post eradication. By next year there will also be the possibility of 'home-grown' Agnes and Gugh birds returning to further boost numbers. This effect has been seen in the latest survey of shearwaters breeding on Lundy, which shows a notable upturn in the rate of population increase from 2008 onward with the possibility of additional recruitment of 'home-grown' Lundy birds as well as further probable increases in immigration (Booker *et al.* 2019).

In 2019 two undamaged shearwater eggs were encountered outside burrows from which birds replied, suggesting that the previous owners had been ousted. These burrows were in the hard ram at Castella Down and at Joggling Rock where digging new burrows may not be an easy option and competition for burrows is occurring. It will be interesting to monitor future occurrences of burrow competition and to detail the proportion of total burrows available that are occupied in 2020.

As in previous years, a large number of shearwaters were recorded attempting to breed at sites where rats are present (see table 4). The most recent SPA survey recorded that as much as 40% of the islands' total Manx shearwater population bred at sites with rats present in 2015/16. The discovery this year of a single fledgling chick on St Marys shows that chicks will evade predation by rats and it seems likely that the populations here are being maintained at low levels by immigration.

Storm petrels

The continued increase in birds recorded breeding at the study beach on Annet suggests that these birds may be doing well on the islands as a whole. In 2019 the small pioneer population at Castella Down on St Agnes was wiped out by cat predation. This problem (and potentially that of the gull mortality on Gugh this year) highlights the complexities of seabird conservation on islands with resident human populations and their pets. The impact of cats that roam freely on wild birds and mammals, whilst being of grave concern to their owners, has been widely documented. We also cannot rule out the possibility that cats are preying on Storm Petrels as a result of rats being removed in 2013.

The remains found were all of adult birds (i.e. birds that had survived at least their first winter) and the timing would suggest that the majority were breeding adults. Most remains were found in early July during peak incubation and when attendance at colonies by juvenile non-breeders is still relatively low (Ratcliffe *et al.* 1998). For a long-lived and slow breeding seabird like the storm petrel, this represents a more serious impact for this particular site.

In early August a letter was sent to all households on St Agnes to appeal for help from the community in addressing this problem along with advice for cat owners on potential ways to minimise the chances of their cats catching birds. A link to one of the videos captured of the cat hunting birds was attached to the letter. The footage was taken at night with infrared, so is black and white, and as yet the cat has not been identified. A feather was sent away for analysis in 2019 and we now have storm petrel DNA primers, so that if the predation was to occur again in 2020 we have the option of sending cat scat samples away for testing.

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