



Seabird Monitoring & Research Project Isles of Scilly 2016



GPS marking Manx shearwater burrows on St Agnes. Photo: Ed Marshall

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Summary of Results

Monitoring of seabird numbers and productivity on St Agnes and Gugh

- Manx shearwater
 - breeding population increased from 22 pairs in 2013 (pre- rat eradication) to 73 pairs in 2016 (post rat eradication)
 - New areas colonised around Kittern Hill and Castella Down
 - 32 'star-gazing' chicks recorded (4 St. Agnes, 28 Gugh)
- Storm petrel
 - recorded breeding successfully on St. Agnes & Gugh for second year
 - 6 storm petrel nest boxes installed in dry stone walling on St. Agnes
- Only 5 pairs of kittiwakes built nests on St Agnes, no chicks hatched
- Lesser black-backed gull
 - colony on Gugh stable at 400 pairs since 2013
 - productivity on Gugh 0.51 – 0.60 chicks per pair
- Two broods of ringed plover chicks observed on St. Agnes

Community involvement on St Agnes and Gugh

- Ten St. Agnes residents have been involved in playback surveys
- 12 community members participated in shearwater 'chick check walks'

Population monitoring work on Annet and outer islands

- Islands missed in the 2015 SPA count due to bad weather
 - Puffin, White, Shipman, Illiswilgig, Castle Bryher and Men-a-vaur surveyed
 - Cormorant population count significantly increased on White Island
- Annual count of breeding seabirds on Annet, numbers generally stable
- Sample beach on Annet surveyed for breeding storm petrel

Productivity monitoring work across the archipelago

- Herring gull: Samson 0.43 chicks per pair (chpp) (n=53) & Hugh Town 1.22 chpp (n=9)
- Kittiwake: Turk's Head 5 pairs nested, no chicks fledged
- Fulmar: Menawethan 0.22 chpp (n=45) & Daymark 0.19 chpp (n=57)
- Common tern: Annet and Merrick Island 0.41 chpp (n=14)
- Shags on Samson: 0.30 chpp (n=27)
- Manx shearwater: Peninnis (n=7) & St Helen's (n=42), little sign of burrow activity later in season Bryher, St. Martin's, Tresco, Peninnis (no chick check walks done)

Isles of Scilly Seabird Recovery Project

The Isles of Scilly Seabird Recovery Project is a partnership project which aims to provide a safe future for internationally important seabird populations on the Isles of Scilly. The full Special Protection Area (SPA) count conducted in 2015 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. The archipelago supports internationally important populations of storm petrel and lesser black-backed gull, and nationally important populations of great black-backed gull and shag (possibly the largest colony in the UK). It is one of only two sites in England where Manx shearwater and storm petrel breed (the other being Lundy).

Working with communities and visitors on the Isles of Scilly, the project aims to protect this seabird heritage, maintaining and enhancing the conservation value of the islands through a programme of targeted conservation action and community participation and learning.

The Project has three primary and inter-linked aims:

- Reverse recent declines in seabird populations on the Isles of Scilly through removal of the non-native brown rat from the islands of St Agnes and Gugh, and maintaining the uninhabited seabird islands 'rat-free'.
- Enable people living on and visiting the Isles of Scilly to learn about, take pride in, and play an active role in celebrating and conserving their seabird and wider natural heritage.
- Train and support island communities to embrace the benefits of seabird recovery, including the removal of rats, and continue to protect their heritage once the project has ended.

The scope of this report

This report covers the results of the seabird fieldwork conducted between April and September 2016 by Isles of Scilly Seabird Recovery Project and RSPB employees and volunteers.

Monitoring of seabird numbers and productivity on St Agnes and Gugh

- Count of all breeding seabirds
- Manx shearwater playback surveys and monitoring of productivity
- Storm petrel playback survey of sample habitat and productivity
- Monitoring of lesser black-backed gull productivity on Gugh

Community involvement on St Agnes and Gugh

- Community members participation and fieldwork training

Population monitoring work on Annet and outer islands

- Final islands in SPA survey missed in 2015
- Annet counts - annual count of breeding seabirds on Annet
- Sample beach on Annet (rat-free) surveyed for breeding storm petrel

Productivity monitoring work across the archipelago

- Herring gulls: Samson and Hugh Town
- Kittiwakes: all sub-colonies
- Fulmars: Menawethan and Daymark
- Common terns: all sub-colonies
- Shags on Samson
- Manx shearwaters on Bryher, Treco, Peninnis and St Helen's

Monitoring of seabird numbers and productivity on St Agnes and Gugh

St Agnes full survey

A full survey of all seabird species breeding on St. Agnes has been conducted annually since 2012 with the results from this and the two previous SPA counts included in Table 1 below. The numbers of apparently occupied Manx shearwater burrows continue to increase across St. Agnes with the number of birds at the newly colonised Castella Down site increasing further. Storm petrels were first recorded breeding here in 2015, and 2016 saw a couple more pairs apparently occupying sites in the boulder beach at Carnew Point. Gull numbers continue to be low, and 2016 saw a poor year for the kittiwakes with only a handful attempting to nest build at all. In 2016 two pairs of ringed plover with at least two chicks each were recorded at Wingletang.

Table 1. Breeding seabirds on St. Agnes

	FUL	MX	SH	LBBG	HG	GBBG	KIT	COT	SP	Total	RPI	OYC
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	-	101	2	9
2013	2	5	0	8	32	0	38	0	0	85	1	8
2014	3	9	0	16	27	1	62	0	0	118	1	10
2015	4	12	0	14	11	1	75	0	6	134	1	7
2016	6	22	0	15	12	1	5	0	9	70	2	8

MX – Manx shearwater; KIT – kittiwake; SP – storm petrel; RPI – ringed plover; OYC – oystercatcher.

Gugh full survey

As on St. Agnes a full survey of all breeding seabird species has been conducted on Gugh annually since 2012 with the results recorded in Table 2 below. As on St. Agnes, the number of Manx shearwaters continued to increase, with a number of new burrows being occupied near Kittern Hill. Although no replies were elicited during playback survey for storm petrels on Gugh, a couple of calling chicks later in the season confirmed the presence of at least two nests at Kittern Hill. Following large declines in the numbers of smaller gulls nesting on Gugh since the 2006 survey, numbers have been consistent for the last few years.

Table 2. Breeding seabirds on Gugh

	FUL	MX	SH	LBBG	HG	GBBG	KIT	COT	SP	Total	RPI	OYC
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	-	446	0	7
2013	1	17	0	418	51	7	0	0	0	494	0	10
2014	5	17	0	411	30	5	0	0	0	468	0	10
2015	1	45	0	419	30	6	0	0	2	503	1	5
2016	1	52	0	400	36	5	0	0	4	498	0	10

Manx shearwater settlement and productivity

Apparently Occupied Burrows were identified during the incubation period using diurnal playback across all of St. Agnes and Gugh as well as at St. Helen's, Peninnis on St. Mary's and part of Shipman Head on Bryher (Table 3 below). Numbers continue to be high on St. Helen's and birds were also heard calling from burrows on Tresco and St. Martin's as in 2015. Little burrow activity was found later in the season on Peninnis and Bryher where rats are still present. 73 apparently occupied Manx shearwater burrows were located in 2016 on St. Agnes and Gugh combined. Not only does this number represent a massive increase in breeding pairs from the 22 apparently occupied burrows recorded across the two islands in 2013 before rat removal, but also a significant spread of locations and sub-colonies.

Table 3. Manx shearwater breeding numbers

	Gugh	St. Agnes	Bryher	St. Helen's	Peninnis	Annet
2000	22	5	12	5	0	123
2006	9	8	13	9	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
2016	52	22	(16)	42	7	-

*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.

In many UK colonies where Manx shearwaters are studied (e.g. Skomer) burrows appear to be relatively short and straight allowing investigation by hand. In addition, over the years many long-term study burrows have been developed with removable turf or rock hatches above the nest chamber to allow easy access and monitoring. In Scilly the small number of easily accessible burrows and their long and convoluted nature has so far precluded this. In the past I tried to ascertain burrow success by looking for signs of occupation as the season progressed (evidence of feathers, droppings and digging with little vegetation overgrowth of the entrance) and by checking by hand for the presence of chick down and nesting material deeper in the burrow in November. This was not particularly satisfactory, giving a flawed estimate of productivity at best. Use of a burrow-scope has helped in some cases, but again the length and turns in the burrows caused problems in confirming occupancy.

Previous studies have shown that '*occasionally from the age of 50 days and more or less nightly during the desertion period, young Manx shearwaters shuffle along the burrow to the entrance and beyond to the open air. In the final nights before fledging they exercise vigorously on the ground, standing on tip toe and whirring their wings enthusiastically.*'¹ The chicks then tend to return to their natal burrows again soon after midnight and well before dawn. It is suggested that they are possibly learning the position of their natal colony from the stars in order that they can return in future years. Accordingly, 'Chick check walks' to look for 'stargazing' fledglings have been conducted on calm moonless nights from mid-August until mid-October each year since 2013 to give a much more

¹ Excerpt taken from '*The Manx shearwater*' Michael Brooke

accurate although minimal estimate of fledging success for the shearwaters nesting on St. Agnes and Gugh.

In 2016 a total of 32 chicks were recorded by this method, with quite a wide range in fledging date (25th August to 21st September) but with some evidence of sub-colony synchronicity. The locations of the fledging chicks observed on St. Agnes and Gugh in 2016 are recorded on the map below. A number of birds emerged from individually marked burrows that were very close at both Kittern Hill and on the south-west coast of Gugh.

Manx shearwater chicks on St Agnes and Gugh 2016



Although the emergence of chicks is highly variable and many chicks will be missed altogether, the 32 Manx shearwater chicks recorded in 2016 can be compared favourably to the 28 seen in 2015 and just 10 in 2014. This gives a minimum breeding success of 0.44 chicks per pair compared to breeding success recorded elsewhere ranging from Skomer and Bardsey 1986-2004, 0.56 and 0.81 ch/pr respectively² and on Lundy 0.62-0.76 ch/pr recorded in 2007.³

No measure of productivity for the Manx shearwater burrows on St. Helen's or any other sites other than St. Agnes and Gugh were recorded due to the intensive nature of the checks needed to get a good estimate and the need to camp out overnight which is not permitted on St. Helen's.

² Mavor RA, Parsons M, Heubeck M & Schmitt S (2006) *Seabird numbers and breeding success in Britain and Ireland 2005*. JNCC Peterborough

³ H. Booker *pers. comm.*

Storm petrel settlement and productivity

Following rat removal, storm petrels first returned to breed on St. Agnes and Gugh last year at Carnew Point, Burnt Island and Kittern Hill. In 2016 this re-colonisation continued successfully with chicks again recorded cheeping from Kittern Hill and adults replying and chicks calling at Carnew Point also. As the amount of potentially suitable habitat across St. Agnes and Gugh is extensive, we decided to identify a limited survey sample area on both islands that takes in both rocky vegetated areas, stone walls and boulder beach habitat. Although no replies were elicited during playback survey around Kittern Hill on Gugh, 2 chicks were subsequently heard cheeping from below vegetation there. The study area on St. Agnes (running from Troytown campsite to Castle Vean) recorded 3 replies, which corrected for response rates (x 2.86) suggests at least 9 pairs breeding there. Later chick check walks recorded 2 storm petrel chicks cheeping from the sample area (see map below.)

Storm petrel chicks on St Agnes and Gugh 2016



In addition, 6 storm petrel nest boxes were placed within a short section of stone walls at Castella Down. These have an enclosed nest chamber made from clear plastic tubs fixed together and accessed by a plastic entrance tube. They will be monitored for any activity or settlement in subsequent years with the hope that if settled it may be possible to access and view the nest whilst causing minimal disturbance.

Lesser black-backed gull productivity

The lesser black-backed gull colony was a similar size to the last few years, though again reduced by half on the 2006 total. Fledging success was also similar to recent years and within the range estimated to be required for colony stability.

Table 4. 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)

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

Community involvement on St Agnes and Gugh

Approximately 84 people live on St Agnes and Gugh, making the Isles of Scilly Seabird Recovery Project the largest community-based island restoration project in the world to date. The residents of St Agnes and Gugh have provided 100% support for the project, and many are actively involved in the ongoing monitoring and biosecurity measures to keep the islands 'rat-free'. Ten St. Agnes residents have so far helped with seabird breeding surveys and in particular Manx shearwater playback on St. Agnes and Gugh, learning the techniques involved and helping to secure a legacy for the project. In particular in 2016, we were keen to get as many residents participating in the chick check walks as possible. Actually seeing the nearly fledged chicks that simply wouldn't have survived before the project is a real thrill and something we have been able to share with 12 residents of all ages in 2016.



St Agnes resident Richard McCarthy joins the team to carry out Manx shearwater 'chick check walks' 1st September 2016.
Photo Nick Tomalin



Manx shearwater chick, Gugh 20th September 2016

Population monitoring work on Annet and outer islands

Full SPA Survey – islands missed in 2015

Due to weather conditions and other constraints Puffin Island, White Island (Samson), Shipman Head, Scilly Rock and Men-a-vaur were not accessed in 2015 as part of the full SPA count. In addition, Illiswilgig and Castle Bryher in the Norrard Rocks could not be visited a second time in early July to survey for storm petrels. The numbers of breeding birds on these islands were estimated based on observations from boats and the previous 2006 counts taking into account the local trends recorded since then. Weather, team and boating permitting, we revisited all of these islands except Scilly Rock to update the estimates with more accurate counts in 2016. The results are recorded in Tables 10a&b at the end of this report and do significantly affect the overall numbers of some species with the % decline in lesser black-backed and herring gulls since 2006 increasing to 26 and 22% respectively. The number of great black-backed gulls is reduced overall changing their population increase from 14% in the last 9 years to 9%.

In particular, White Island had many more cormorants breeding there than estimated, due to an undetected rocky depression. This increased the population count for cormorants from 30 pairs to 53, resulting in a 6% increase in numbers rather than the previously feared 40% drop since 2006.

As outlined above, these updated counts in 2016 significantly affect some of the species totals for Scilly and therefore condition assessments for the SPA and individual SSSIs. Rather than produce an addendum which would need to be read in conjunction with the main SPA survey report published in 2015, a revision of the full SPA Survey Report 2015/16 text is planned for publication early 2017.

Annual count of breeding seabirds on Annet

Table 5 summarises the results of all the counts of breeding seabirds on Annet since 2000. No counts were made in 2001 and in 2005. The annual count concentrates mainly on the numbers of gulls and shags. Oystercatchers and ringed plovers are included in the count most years, however due to logistics a count of the burrow nesting puffin, Manx shearwater and storm petrel is not included.

Following a main count at the end of May in 2016, plus a boat count for fulmars, the overall numbers of seabirds (minus burrow-nesters) recorded breeding on Annet this year were similar to the last few years. The numbers of smaller gulls and shags are now much reduced compared to 2006 and before. In addition, common terns returned to breed on the south end of the island in 2016. The reduction in the number of puffins recorded breeding on Annet in 2015 compared to the last count in 2006 (down 38% from 50 to 31) is covered in the 2015/16 SPA Report and is most likely linked to the increase in the number of these birds nesting on Mincarlo (up 34% from 38 to 51) over this same time period.

Table 5. Breeding seabirds on Annet (a dash indicates that no count was made)

Year	SH	GBBG	LBBG	HG	RAZ	FUL	COT	TOTAL	SP	MX	PUF	OYC	RPL
2000	209	137	517	42	4	21	1	931	938	123	47	-	-
2001	-	-	-	-	-	-	-		-	-	-	-	-
2002	-	171	215	7	4	-	-		-	-	-	-	-
2003	150	164	18	17	0	45	0	394	-	-	-	-	-
2004	159	197	7	32	2	44	0	441	-	-	-	5	0
2005	-	-	-	-	-	-	-		-	-	-	-	-
2006	177	187	281	24	4	37	0	710	788	89	50	-	-
2007	140	88	0	5	1	37	0	272	-	-	-	5	0
2008	164	47	(5)	4	3	48	0	271	-	-	-	6	0
2009	154	168	54	7	7	43	0	433	-	-	-	6	0
2010	198	213	76	11	2	40	0	540	-	-	-	7	1
2011	115	180	27	5	4	37	0	368	-	-	-	4	2
2012	107	177	32	8	2	49	0	375	-	-	-	-	-
2013	99	208	6	4	1	36	0	354	-	-	-	5	0
2014	96	205	10	5	1	38	0	355	-	-	-	9	1
2015	85	235	1	20	5	57	2	405	778	229	31	6	0
2016	86	215	1	16	6	41	14	379	-	-	-	4	1

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

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 and results from this are presented below along with the previous SPA counts from 2000, 2006 and 2015. Although confidence intervals on playback survey results are relatively large due to low response rates, these counts suggest relative stability in storm petrel numbers on Annet.

Table 6. 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

Productivity Monitoring Species Accounts

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.* 1995⁴).

Herring gull *Larus argentatus*

In 2016, the numbers of herring gull settling on the Samson study beaches was greater than the previous two years but fledging success relatively low. The number of pairs nesting in Hugh Town was slightly reduced compared to previous years and the fledging success lower too, although still much higher than at the more natural sub-colonies and more than high enough to sustain the population. Gimble Porth on Tresco remains devoid of breeding seabirds altogether; in 2006 this site supported 54, 4 and 37 breeding pairs of herring gull, lesser black-back gull and kittiwake respectively.

Table 7. Herring gull productivity estimates

Year	Gimble Porth	Samson	Hugh Town
2008	0.48 (n=50)	0.30 (n=84)	1.29 (n=7)
2009	0 (n=41)	0.66 (n=73)	1.67 (n=6)
2010	0 (n=17)	0.68 (n=63)	1.86 (n=7)
2011	0 (n=9)	0.54 (n=71)	2.25 (n=8)
2012	0 (n= 3)	0.46 (n=56)	1.4 (n= 10)
2013	0 (n=2)	0.56 (n=55)	1.22 (n=9)
2014	Deserted	0.50 (n=34)	1.25 (n=13)
2015	Deserted	(n=56)	(n=14)
2016	Deserted	0.43 (n=53)	1.22 (n=9)

Kittiwake *Rissa trydactlya*

Since 2006 when there were 266 pairs of breeding kittiwakes spread across 6 sub-colonies in Scilly there has been a dramatic decline in population. By 2014, following a number of years of poor breeding success, there was only one breeding site and just 62 breeding pairs. In 2016 the birds returned to this one site, below the Turk's Head on St. Agnes but didn't show much interest in breeding. A maximum of 30-40 birds were loosely associated with the cliffs there in late May to early June, but only a maximum of 5 appeared to make a nest and none hatched chicks.

⁴ Walsh PM, Halley DJ, Harris MP, del Nevo A, Sim IMW & Tasker MC (1995) *Seabird monitoring handbook for Britain and Ireland*. JNCC/ RSPB/ ITE/ Seabird Group, Peterborough.

Fulmar *Fulmarus glacialis*

Discrete cliff-side colonies on Menawethan and the Daymark St. Martin's, were monitored as in previous years, from the sea. Numbers settling were similar to previous years and breeding success was similarly low with just 21 chicks fledged from 102 nesting attempts. As in previous years this poor success was repeated elsewhere on the islands, with very few chicks seen to fledge from Round Island or Annet (W. Wagstaff., & pers. obs.)

Table 8. 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

Common tern *Sterna hirundo*

As in recent years the terns were very late to return to the islands and show any interest in breeding. In fact the first hatched chicks were only observed on Annet on the 7th July, suggesting a laying date as late as mid-June. The birds on Annet did however manage to fledge a couple of young as did a couple of pairs on Merrick Island in Tresco Channel. No breeding activity was recorded at their usual preferred sites of Samson and Green Island in 2016.

Table 9. Common tern productivity estimates

Year	Productivity	Notes
2003	0.43 (<i>n</i> = 86)	
2004	0.59 (<i>n</i> = 76)	Majority of nests on North Hill, Samson
2006	0 (<i>n</i> = 78)	Young inundated by storm tide, Green Island
2007	0 (<i>n</i> = 1)	Only one breeding attempt recorded, Annet
2008	0.26 (<i>n</i> = 51)	Green Is. 41 nests; Peasehopper 10 nests
2009	0.39 (<i>n</i> = 52)	Green Is. 51 nests; Annet 1 nest
2010	0 (<i>n</i> = 0)	Birds settling on Green Is. But site abandoned before laying
2011	0 (<i>n</i> = 10+)	Late settlement, then Green Is. Site inundated by storm tide
2012	0 (<i>n</i> ≤ 10)	Late settlement, some eggs lost to storm tide Green Island
2013	0	No breeding attempts recorded
2014	0.42 (<i>n</i> = 31)	3 chicks from 12 nests Green Is.; 10 from 19 North Hill Samson
2015	0 (<i>n</i> = 12)	2 Annet; 10 Samson (failed early egg stage)
2016	0.41 (<i>n</i> = 17)	South end Annet very late settling; also 3 newly fledged chicks seen Merrick Island

Shag *Phalacrocorax aristotelis*

In 2016 productivity data was collected for shags for the first time. The shags nesting in Scilly tend to be very 'flighty' with the majority of birds flushing from the beach back nests on disturbance. This apparently differs from a number of other colony sites where these birds are studied and found to remain on their nests, which are often on more cliff ledge locations (e.g. on the Isle of May). This poses an issue for collecting productivity data which requires a number of site visits through the season to account for less synchronised nesting. In 2016 a survey on Samson was trialled as it was hoped that the birds here would be more used to human disturbance and less likely to flush.

Unfortunately, the majority of birds did flush as I passed by their nest sites, so I restricted my visits to just three, a few weeks apart, in late May, early and late July. This gave a generous estimate of 35 shag chicks fledged from the 27 nests monitored; 1.30 chicks per pair. This is likely to be a slight overestimate as some smaller chicks on the last visit may not have fledged and all large chicks that disappeared from the nest between the last two visits are assumed to have fledged. The locations of the shag nests on Samson in 2016 are shown on the map below.



Discussion

On the 13th February 2016 the islands of St. Agnes and Gugh were declared officially rat free. Comparing the numbers of Manx shearwater present in 2013 before baiting began and three years later in 2016, it is clear that rat removal has had a positive impact on the numbers and distribution of apparently occupied burrows and on fledging success. That storm petrels have returned to breed successfully on St. Agnes and Gugh already is also a phenomenal result for the project. The 2015 count confirmed a three-fold increase in the numbers of shearwaters breeding across the archipelago since 2006 with colonies being found at a number of new sites. With young shearwaters taking at least four or five years to recruit to the breeding population, it is too soon for this increase to be attributed fully to rat removal in Scilly. It seems most likely that rat removal at nearby colonies (such as Lundy and Ramsay) has produced a surplus of young birds, a number of which may have come to breed in Scilly. For example Lundy has seen a ten-fold increase in occupied burrows to over 3000 since rat removal in 2004 and with the increased breeding success on St Agnes and Gugh following rat removal, these islands will have appeared more favourable for birds prospecting breeding sites.

Population counts in 2016 on some of the islands missed due to poor weather as part of the full SPA count in 2015 shed further light on the changes in seabird numbers since 2006. Counts of herring and lesser black-backed gulls confirmed the decline in their populations was even steeper in the last nine years at 22 and 26% respectively, whilst the increase in great black-backed gulls was reduced from 14 to 9%. In particular the discovery of a number of nests in a previously unseen rocky depression on White Island confirmed that the cormorant population rather than having dropped by 40% has in fact increased by 6%. See tables 10a & b.

2016 was another poor year for the kittiwakes with birds appearing to return to the colony in such poor condition that the majority did not even attempt to build a nest, with few if any eggs laid and no chicks hatched. This overall decline is in line with regional trends, where the loss of birds from southern English colonies is in the region of 44%. Common terns also returned to the islands very late and in fewer numbers than ever. However, after a very late start they did at least manage to fledge a few young.

The worrying decline in herring gull numbers continues and only the small Hugh Town sub-colony shows fledging success high enough to maintain a stable population. Fulmar productivity was particularly low in 2016 also and this is in line with regional trends for a reduction in numbers of this species in recent years. Annet numbers appeared stable in comparison to recent years.

2016 was the first year I attempted to record breeding success in shags. As discussed the birds proved flighty and most flushed when I attempted to observe any nest contents. Limiting the number of visits to just three, one early and two later in the season, hopefully reduces any negative disturbance impact from observations whilst allowing a reasonable estimate of breeding success. The estimated breeding success recorded of 1.30 chicks per pair is slightly higher than the mean breeding success of 1.21 chicks per nest per year between 1986 and 2008⁵, and lends weight to the suggestion that poor survival of either juveniles and/or adult birds in stormier weather is implicated in the shag population declines seen across Scilly and elsewhere in the UK.

⁵ JNCC website, analysis of the Seabird Monitoring Project dataset.

Table 10a. Full SPA count data from 2015, updated with selected counts from 2016 (see Table 10b)

ISLAND	FUL	MX	SP	COR	SH	LB	HG	GB	KIT	COT	SAT	GUI	RAZ	PUF	TOTAL
2015/16 Total	287	523	1335	53	1025	2485	556	984	75	12	0	291	473	167	8266
2006 SPA Survey	279	171	1398	50	1296	3335	715	901	266	78	1	155	342	174	9161
Seabird 2000	183	201	1475	56	1108	3608	903	808	281	96	0	196	296	167	9378
Changes since 2006	+3%	+206%	-5%	+6%	-21%	-26%	-22%	+9%	-72%	-85%	n/a	+88%	+38%	-4%	-9.8%

FUL – fulmar; MX – Manx shearwater; SP – storm petrel; COR – Cormorant; SH – shag; LB – lesser black-backed gull; HG – herring gull; GB – great black-backed gull; KIT – kittiwake; COT – common tern; SAT – sandwich tern; GUI – guillemot; RAZ – razorbill; PUF – puffin; OYC – oystercatcher; RPL – ringed plover.

Table 10a gives the total SPA count for 2015/16. The majority of the count was completed in 2015, but some counts were delayed until 2016 due to bad weather (these are highlighted in yellow in Table 10b). The last row details the percentage change in numbers since 2006, population increases are shown in blue and decreases in red. This data and the resulting changes in the SSSI status assessments is presented in full in the revised full SPA Survey Report 2015/16 published Autumn 2017.

Table 10b on the next page gives the full updated SPA count table. Estimated counts from 2015 that were updated with full surveys in 2016 are indicated in yellow. For Men-a-vaur and Scilly Rock some counts are still estimates because of poor weather, these are shaded in pink.

Table 10b. Full SPA count data from 2015, updated with counts from 2016

ISLAND	FUL	MX	SP	COR	SH	LB	HG	GB	KIT	COT	SAT	GUI	RAZ	PUF	TOTAL	2006	2000		OYC	RPL
Annet	57	229	778		85	1	20	235		2			5	31	1443	1638	2039		6	0
Bow, St Agnes								1							1					
St Agnes, Big Pool & Browarth							1								1	9			4	
St Agnes, Wingletang		10					1								11	12	35		1	1
St Agnes, not SSSI	4	2	6			14	8	1	75						110	3			2	
Burnt Island, St Agnes			11				1								12	0	0			
Tins Walbert															0	0	0		1	
Gugh		45	2			419	29	6							501	1090	1464		4	1
Kittern Rock, Gugh	1						1								2	1	0			
Tresco, Castle Down		46													46					
Tresco, Porth mellin							1								1					
Tresco, Appletree Point							11								11	4			2	
Tresco, Gimble Porth															0	95	237			
Tresco, Pentle bay SSSI							8								8	25			9	4
Merrick Island, Tresco						1	2	1							4	1				
Green Is (Tresco)							1								1	4	1		2	1
Plumb Is, Tresco							2								2	4	13		1	
Round Island	11	78	172		16	2	2	20						1	302	342	265		1	
Gweal	2				61	35	7	72					8		185	175	186		6	1
Mincarlo	21		9		58			33				20	120	51	312	310	294		1	
Illiswilgig			52		24		3	16					8		103	59	55			
Maiden Bower					1	1	1	1							4	1	7			
Castle Bryher	13		3		9	1	2	1					26		55	53	59			
Scilly Rock			21		35		2	2				60	70	35	225	189	152			
Seal Rock															0	1	0			
Men-a-vaur	19		14		24	1	1					110	88	5	262	264	303			
Norwethel						102	22	11							135	83	41		1	
Peashopper Is								6							6	15	2		1	
Crow's Is						2	4	2							8	4	6			
Foreman's Island							1								1	5	6		1	
St Helens	5	36			7	448	30	12						11	549	836	623		2	
Tea						131	42	6							179	54	103		5	3
Pednbrose							5	20							25	18	0		1	
Old Men, Tea						5	10	2							17	2	0		1	

ISLAND	FUL	MX	SP	COR	SH	LB	HG	GB	KIT	COT	SAT	GUI	RAZ	PUF	TOTAL	2006	2000		OYC	RPL
St Martin's, Daymark	46	26				2	9	3							86	80	138		4	1
Plumb Is, St Martins							3								3	13	6			
White Island (St Martins)	8					106	15	1							130	231	69			
Guther's Island					7	6	20	30							63	41	48			
Pernagie Island					4			8							12	11	11			
Hedge Rock							1	1							2	1	2			
Great Ganinick				5	10		9	11							35	49	48		2	
Little Ganinick					45		5	27					2		79	58	63			
Little Ganilly					2	4	7	21							34	27	20		2	
Great Ganilly		1			33	70	23	35							162	45	58		4	
Nornour						5		17							22	14	10		1	
Great/Little Arthur	9				10	76	26	45							166	53	46		4	
Ragged Island				0	30	2	1	27					18		78	88	79		1	
Menawethan	43				38		1	66					4	4	156	182	139		2	
Little Innisvouls					46	2		15							63	52	38			
Great Innisvouls	11				60		1	45					13		130	169	131		1	
Hanjague					2			1							3	5	3			
Samson	15				27	978	126	7		10					1163	1310	1309		11	2
Green Island (Samson)															0	57	7			
White Island (Samson)				38	7	14	6	31							96	100	114		2	
Puffin Island					15	35	12	4							66	174	145		1	
Bryher, Shipman Head Down		39				5	8								52	18	1		1	
Bryher, not SSSI						2	27	1							30	8			2	1
Bryher Rushy bay SSSI						1	8								9				1	
Shipman Head	6				17	8	5	2					2		40	35	102		2	
Hangman's Island					2		3	1							6	6	0		2	
Merrick Island, Bryher Carn of bars						1	2	1							4	3	0			
Rosevean	4		26		21	5	1						4		61	99	74		2	
Rosevear			112		139		1	95					16	14	377	401	285		2	
Gorregan	12		32		62		3	1				99	53	2	264	232	230		1	
Great Crebawethan															0	3	6			
Melledgan			97	10	128			40				2	36	13	326	295	297		1	
St Marys, Peninnis		8													8	0	0			
St Marys not SSSI		3					15								18	3	2			1
2015 Totals	287	523	1335	53	1025	2485	556	984	75	12	0	291	473	167	8266	9161	9378		101	16