



# SKOKHOLM

BIRD OBSERVATORY



South and West Wales  
De a Gorllewin Cymru

## Seabird Report 2017

### A summary of breeding seabirds on Skokholm in 2017.

|   | Total<br>(2016-2013 in parenthesis)                      | Productivity<br>(2016-2013 in parenthesis) |
|---|--|--|
| Fulmar                                    | 213 aia (194, 179, 179, 170)                             | 0.45 (0.57, 0.47, 0.53, 0.34)              |
| Manx Shearwater                           | 295 responses in 8000m <sup>2</sup> (297, 269, 241, 263) | 0.80 (0.68, 0.68, 0.63, 0.75)              |
| Storm Petrel                              | 89 transect responses (76, 87, 82, 91)                   | 0.50 (0.58, 0.55, 0.69, -)                 |
| Puffin                                    | 7800 adults (6692, 6665, 5070, 4834)                     | 0.80 (0.73, 0.75, 0.74, 0.73)              |
| Razorbill                                 | 2491 aol (2242, 2382, 2052, 2294)                        | 0.40 (0.39, 0.21, 0.40, 0.66)              |
| Guillemot                                 | 4038 aol (3949, 3603, 3512, 3466)                        | - (-, -, -, 0.55-0.61)                     |
| Lesser Black-backed Gull                  | 1123 aia (1397, 1486, 1565, 1476)                        | 0.38 (0.23, 0.15, 0.30, 0.16)              |
| Lesser Black-backed x <i>Larus</i> hybrid | 0 pairs (1, 1, 2, 2)                                     | 0 (0, 0, 0, -)                             |
| Herring Gull                              | 302 nests (322, 289, 300, 263)                           | 0.70 (0.86, 0.66, 0.70, 0.72)              |
| Great Black-backed Gull                   | 93 nests (93, 83, 84, 74)                                | 1.54 (1.38, 1.66, 0.93, 1.80)              |

#### Fulmar *Fulmarus glacialis*

**Fairly Common Breeder** first bred in 1967

3 pulli trapped

1936-1976: 34 trapped

#### Aderyn-drycin y Graig

A minimum of 101 were already on ledges when staff returned to the Island on 12<sup>th</sup> March. However the majority of counts during the remainder of the month were low, including just 11 on the 24<sup>th</sup>, a single on the 26<sup>th</sup> and eight on the 29<sup>th</sup>. There were March highs of 139 on the 13<sup>th</sup>, 99 on the 17<sup>th</sup> and 137 on the 20<sup>th</sup>, totals which failed to suggest that it would go on to be a record year. April saw regular departures from the cliffs, with lows of between 30 and 54 noted on five dates but three-figure counts logged on eight dates. Following a 1<sup>st</sup> May total of 99, there was the usual prelaying exodus with 11 days when counts ranged between 56 (on the 2<sup>nd</sup>) and nine (on the 5<sup>th</sup>). Numbers then increased slowly, with 84 on the 13<sup>th</sup> and 14<sup>th</sup>, 94 on the 18<sup>th</sup> and 120 on the 23<sup>rd</sup>. The first eggs were seen on 19<sup>th</sup> May, one day later than the first of last year and two days earlier than the first of 2015; the first egg of 2014, following prolonged and severe winter storms, was on the 28<sup>th</sup>.

The six study plots counted annually since 2006 were visited on ten dates between 29<sup>th</sup> May and 12<sup>th</sup> June. Up until this season only three of these plots have contained Fulmars, however an apparently incubating bird occupied a niche in the top third of the North Gully auk colony for five dates from 1<sup>st</sup> June. Although the number of apparently incubating adults was not quite as consistent between visits as in the previous two years, with a range of six compared with five in 2016 and four in 2015, this was still the third tightest spread to date. The mean of 29 was two up on the previous three years and the most recorded since the plots were instigated, although this was not due to an increase at every plot; the number of apparently incubating birds at Guillemot Cliff remained at five for a fourth successive year, whilst there were two extra pairs at Little Bay (where the number of sites had declined at a rate of one a year since 2013) and one fewer at Middlerock (where the number of sites had increased at a rate of one a year since 2013).

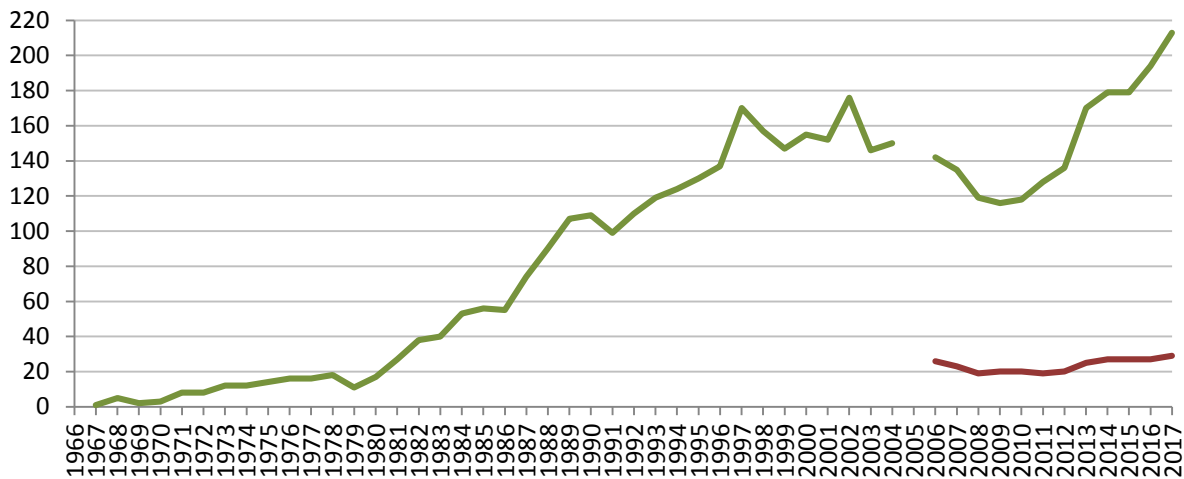
#### The whole Island totals (apparently incubating adults), mean plot totals, range of totals over the ten study plot visits and the percentage of the Island total made up of study plot birds.

|        | 2008    | 2009    | 2010    | 2011    | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    |
|--------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Island | 119     | 116     | 118     | 128     | 136     | 170     | 179     | 179     | 194     | 213     |
| Plots  | 19      | 20      | 20      | 19      | 20      | 25      | 27      | 27      | 27      | 29      |
| Range  | (16-25) | (16-27) | (17-24) | (16-22) | (16-25) | (22-28) | (23-29) | (26-29) | (25-29) | (26-31) |
| Plot % | 16.0    | 17.2    | 17.0    | 14.8    | 14.7    | 14.7    | 15.1    | 15.1    | 13.9    | 13.6    |

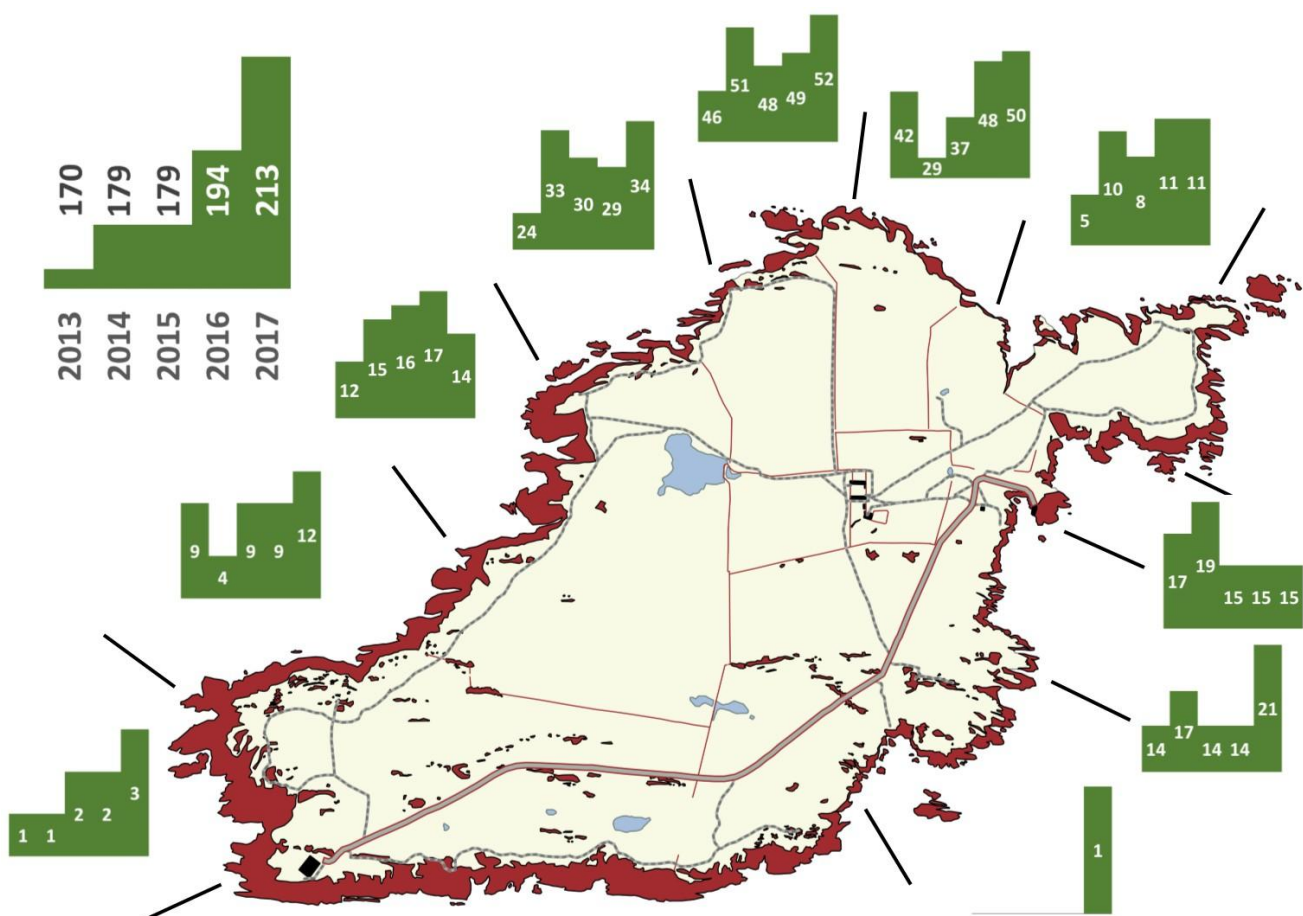
The whole Island count of apparently incubating adults (aia) undertaken between 28<sup>th</sup> May and 2<sup>nd</sup> June yielded an average of 213aia, an increase of 9.8% on the 194 logged in 2016 and the highest

total yet recorded on Skokholm. The largest increase was observed around Hog Bay where there were seven extra nest sites this year. There were five additional sites around North Gully and three extras were mapped at the Bluffs and Little Bay Point. Numbers around the Neck remained stable and there was breeding in Crab Bay for the first time in at least five years (an attempt which went on to fail). The only decline was noted between Purple Cove and Twinlet, with this drop in numbers at least in part attributable to early failures before the survey period (failures brought about by aggressive interactions between adjacent pairs).

**The total number of apparently incubating Fulmar recorded on Skokholm since breeding began in 1967 and the number within the study plots since 2006.**



**The distribution of apparently incubating Fulmar 2013-2017.**



The 2017 whole Island count includes approximately 40 pairs which would be difficult or impossible to see from the Island itself (birds seen from a boat north of North Gully, near Wreck Cove, on the Little Neck and in hidden crevices between Smiths Bay and Little Bay Point). The drop in numbers observed between 2006 and 2012 may perhaps thus be linked to a lack of boat access, although the study plots broadly mirrored the dip in the Island total. The proportion of the Island total made up of study plot birds dropped to 13.6% this year (from a high of 17.2% in 2009); this was the lowest recorded since the plots were begun and perhaps an indication that they are not, due to a lack of space for expansion, representative of the Island as a whole.



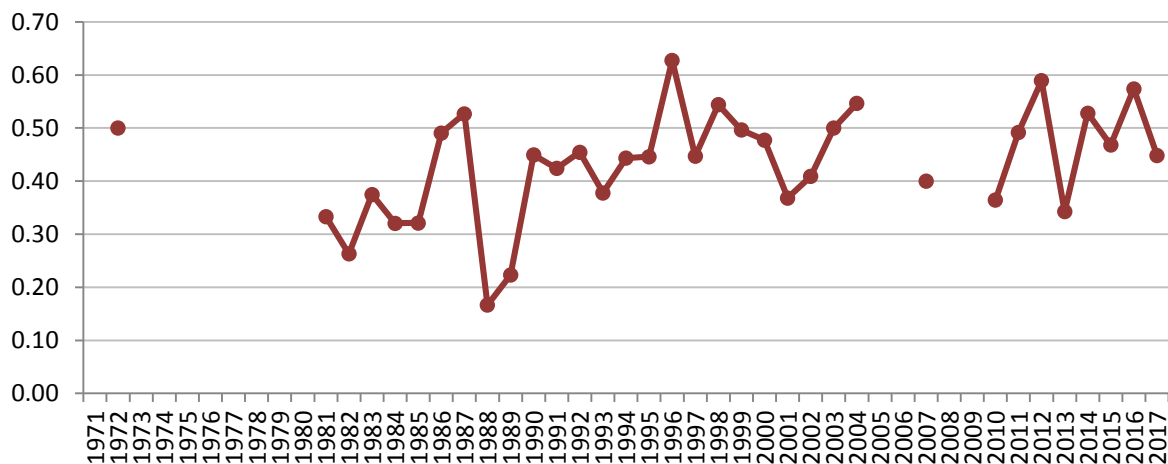
It is likely that the increase in Fulmar numbers will affect other species; the previous two years saw both adult and young Herring Gulls oiled by nesting Fulmars, on 15<sup>th</sup> June this season a Razorbill and its chick were evicted from a ledge by prospecting birds and a bedraggled juvenile Peregrine between the 18<sup>th</sup> and 22<sup>nd</sup> July was seemingly also oiled. More intraspecific interactions were noted this year; incubating birds at both Middlerock and North Gully were oiled by aggressive neighbours and in both cases the egg was lost. Additionally an adult was heavily oiled at Little Bay.

On 20<sup>th</sup> May 58 incubating adults were selected for productivity monitoring (eight at Twinlet, seven at North Gully, 22 around Little Bay Point, five at Rat Bay and 16 at Peter's Bay); birds seen with eggs or those apparently incubating for ten consecutive days from this date were included in the sample (thus more birds were initially monitored but were soon found not to be incubating). Of these four failed at early egg stage (eggs were broken in three of these cases, at least twice due to aggressive interactions with other Fulmars), a further five definitely failed at egg stage, 21 failed at the egg/small chick stage and two failed having definitely produced a chick (with one chick going missing after 13 days and the other after 14 days); there were none of the failures at large chick stage seen in 2014 and 2015. Thus 26 (44.83%) of the monitored attempts produced a fledgling; a productivity estimate of 0.45 fledglings per pair is 21.1% down on the 0.57 logged in 2016 but 4.7% up on the post 1972 average of 0.43. Despite such average productivity, the increase in the Island population

leads to a predicted 95 Skokholm fledglings in 2017, equalling that predicted in 2014 and only previously exceeded by the 111 predicted last year. Poor productivity at Peter’s Bay between 2013 and 2015 influenced the overall figure for those years; Peter’s Bay productivity in 2013 was 0.06 (compared with an overall figure of 0.34), in 2014 it was 0.33 (compared with 0.53 overall) and in 2015 it was 0.18 (compared with 0.47 overall), however last season saw 0.54 fledglings per pair (virtually identical to the overall value of 0.57). This year again saw below average productivity at Peter’s Bay, with 0.31 fledglings per pair; the reason for this near annual discrepancy is still unclear.



**Fulmar productivity (total number of fledged chicks per monitored pair) for each year that it has been calculated between 1972 and 2017. The 1972-2017 mean is 0.43 chicks per pair.**



As was the case last year, the first two fledglings departed their nest ledges on 22<sup>nd</sup> August (20<sup>th</sup> August in 2015, 23<sup>rd</sup> August in 2014 and 25<sup>th</sup> August in 2013). All of the study chicks departed over the following 12 days (seven fewer days than last year), with 38.5% having fledged by 24<sup>th</sup> August (38.7% by the 28<sup>th</sup> last year), 50.0% by 29<sup>th</sup> August, 80.8% by 1<sup>st</sup> September (64.5% by 30<sup>th</sup> August last year) and 96.2% by 2<sup>nd</sup> September (80.6% by the 3<sup>rd</sup> in 2016). The last study chick fledged on 3<sup>rd</sup> September, five days earlier than the last of 2016 and seven days earlier than the last of 2015. The number of birds around the cliffs dropped rapidly as the fledglings departed, with 63 logged on 6<sup>th</sup> September (when only a single fledgling was seen on the cliffs), 34 the following day (the first date when the cliffs were apparently empty), a late peak of 45 close in on the 11<sup>th</sup> and only single figure counts from the 14<sup>th</sup> to the 23<sup>rd</sup>. Despite considerable seawatching effort there were no further birds logged until 24 on 25<sup>th</sup> October. Seven were in Broad Sound on 28<sup>th</sup> October and 11 were close in on the 31<sup>st</sup> but did not land. There were daily counts in November until the departure of staff on the 9<sup>th</sup>,

all of which were below 14 with the exception of 116 on a calm 6<sup>th</sup> (when 33 birds were back on ledges, four days before the first autumn landing of 2016), 54 on the 7<sup>th</sup> (when only seven birds came ashore) and 73 on the 8<sup>th</sup> (when at least 30 birds were ashore).

**Manx Shearwater** *Puffinus puffinus*

**Aderyn Drycin Manaw**

**Very Abundant Breeder** a 2012-2013 census estimated approximately 63980 pairs (46184 in 1998)

1248 trapped (including 135 pulli), 655 retrapped, 1 control

1936-1976: 169,895 trapped, 2011-2016: 6810 trapped, 2690 retrapped, 15 controls

One calling near the Lighthouse after dark on 19<sup>th</sup> March was six days earlier than the first to be logged last year, one day earlier than the first of 2015 and five days earlier than in 2014. The first to be eaten by a Great Black-backed Gull was noted the following day and it was not until the 26<sup>th</sup> onwards that birds were obvious each night. Numbers increased quickly but, as in the previous two years, seawatching during a remarkably calm April produced some surprisingly small counts, with highs of just 1100 on the 9<sup>th</sup> and, with a stiff south-southeasterly wind, 6143 on the 30<sup>th</sup>. May was for the most part calm, with maximum raft counts of 4476 on the 10<sup>th</sup> and 4000 on the 11<sup>th</sup> and 14<sup>th</sup>, whilst the largest counts in what was also a settled June came on the few days of stronger winds, with a minimum of 10000 on the 6<sup>th</sup>, 16000 on the 10<sup>th</sup>, 10500 on the 11<sup>th</sup> and 7500 on the 30<sup>th</sup>. July was another predominantly calm month, with the highest counts coinciding with stiffer winds during the last six days; a minimum of 43000 were logged on the 26<sup>th</sup>, 20000 on the 27<sup>th</sup>, 28000 on the 28<sup>th</sup> and 36900 on the 30<sup>th</sup>, the former being the highest July count and the second highest daycount of the last five years. Moderate southwesterlies in August produced 11 five-figure daycounts and highs of 35050 on the 3<sup>rd</sup>, 36230 on the 9<sup>th</sup>, 42021 on the 11<sup>th</sup> and 26000 on the 21<sup>st</sup>.



A Manx Shearwater ringing transect was established in 2013. It was defined as the track between the Observatory and the Lighthouse and the length of a landing net to either side; ringers were not to deviate from the track. The aim was to see whether, by ringing birds on the surface in this defined area, the retrap data could be interpreted to provide large sample size estimates of adult survival and the recruitment of juveniles to the breeding population. This is still a project in its infancy which is producing a substantial amount of data, but here follows a brief summary of the results so far. Of

the 3200 adult birds ringed along the transect between 2013 and 2015, 731 (22.84%) were retrapped in a subsequent year. Unsurprisingly the proportion of birds retrapped increases with cohorts ringed longer ago, for example 291 (33.26%) of the 875 adults ringed in 2013 have been found in later years (including 12 seen during this season but in no other). Of the 3200 adults ringed, 67 (2.09%) have been found dead, primarily the result of Great Black-backed Gull predation; this proportion again increases with older rings, with 29 (3.31%) of 2013 ringed adults having been found predated. There were 991 fledglings ringed along the transect during the same period, only 30 (3.03%) of which have been encountered subsequently (including 6.34% of 2013 ringed youngsters). An adult found on the surface on the night of 3<sup>rd</sup> July was surprisingly in the process of laying an egg.

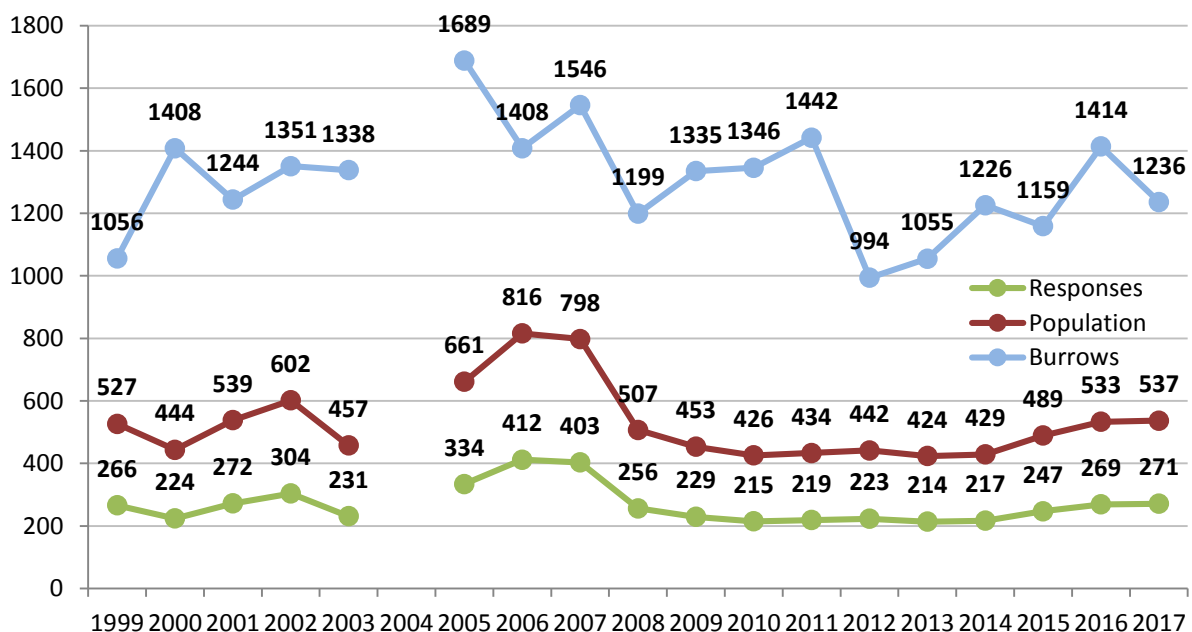
Three areas of study burrows, that is to say natural burrows where a paving slab covers a manmade access point to the nest chamber, were established in 2012 and 2013 with all birds encountered within the burrows ringed. Of 287 breeding adults bearing rings in 2016, 238 were found this year (82.93%). This figure is not an accurate estimate of adult survival as there was no searching for marked birds in neighbouring non-study burrows, thus it may well be revised upwards when birds are discovered in future years; for example 82.27% of 2013 adults were encountered in 2014 but we now know that at least 87.94% of birds were alive. Additionally there is a large discrepancy in return rates depending on the breeding success of the previous year; of 177 birds successful with their 2016 breeding attempt, 158 returned in 2017 (89.27%), whereas only 62 unsuccessful birds returned (71.26%). Indeed, of 44 birds which went missing in 2017, 25 (56.82%) had either failed with their breeding attempt in 2016 or had been found without an egg in a burrow in which they had previously bred; given that this failure rate is significantly higher than the 32.26% observed overall in 2016, it could perhaps be concluded that some of the missing birds have not perished, but rather opted for more suitable nesting sites. The study burrows perhaps thus give a better insight into burrow fidelity and show an interesting correlation with the stability of the colony; in the fragile Lighthouse colony 36 (44.4%) marked birds were in the same burrow this year as that in which they bred in 2013, whereas in the more stable Crab Bay and Quarry Track colonies 31 (77.5%) and 11 (61.1%) were still present respectively. The fragile nature of the Lighthouse colony, along with the high density of burrowing birds, sees the structure of the breeding tunnels change annually and clearly some lose their suitability as nest sites. Considerable damage caused by the 2017 Storm Ophelia to burrows in the Lighthouse Study Plot is likely to result in an even higher proportion of birds moving nest site in 2018. Ringed as a chick in 2013, FB42748 was seemingly paired and very close to its natal burrow; this was the first of our study chicks to be found back in the study burrows.



The study burrows also facilitate an accurate assessment of breeding success on Skokholm. There were 128 burrows at the Lighthouse occupied by a pair which produced an egg, eight burrows contained an egg along the Quarry Track and 23 pairs produced an egg inland of Crab Bay. There were thus 159 burrows this year from which productivity could be assessed. Of these 11 definitely failed at egg stage and 15 failed at egg or very small chick stage (but neither eggs nor dead chicks were found). Six pairs failed with chicks which were yet to put on any significant primary growth. For a chick to be assumed to be of fledging size it was required to reach a wing length in excess of 200mm (although not ready to fledge, we have shown that chicks larger than this size may swap to a different burrow and therefore go undetected). There were 127 chicks which reached this size in 2017. Productivity was thus 0.80 fledging sized chicks per breeding pair (79.87% of pairs produced a fledging sized chick). This is a 17.6% increase on the 0.68 logged last year, is 12.7% up on the five year average of 0.71  $\pm$ se 0.02 and is the highest productivity recorded for many years. It should be noted that this is the number of chicks which attained fledging size and does not reflect the number of fledglings which are lost to Great Black-backed Gull (and to a lesser extent corvid) predation as they exercise their flight muscles and make their first flights (see below). Having said that, only two of the 135 fledglings ringed in the study plots were found predated (with a third bird found dead due to puffinosis).

In 1999 nine study areas, each a circle of 1000 square metres, were established to allow a reasonable subset of the Skokholm Manx Shearwater population to be monitored from year to year. Two of these plots were discontinued, one in 2006 and one in 2007, as the survey work was disturbing the Lesser Black-backed Gull colonies. New plots were established in 2006 and 2015 to maintain a good sample area, however only seven plots have been sampled for a full 18 years. On each annual visit the number of burrows within the area is counted, along with the number of burrows from which a response is elicited when the call of a male bird is played down them. The standard correction factor (1.98) is then used to estimate the population within the area (see the 2013 and 2014 Seabird Reports for checking of the correction factor).

**The total number of burrows, responses and the corrected population estimate for the 7000 square metres sampled annually since 1999.**

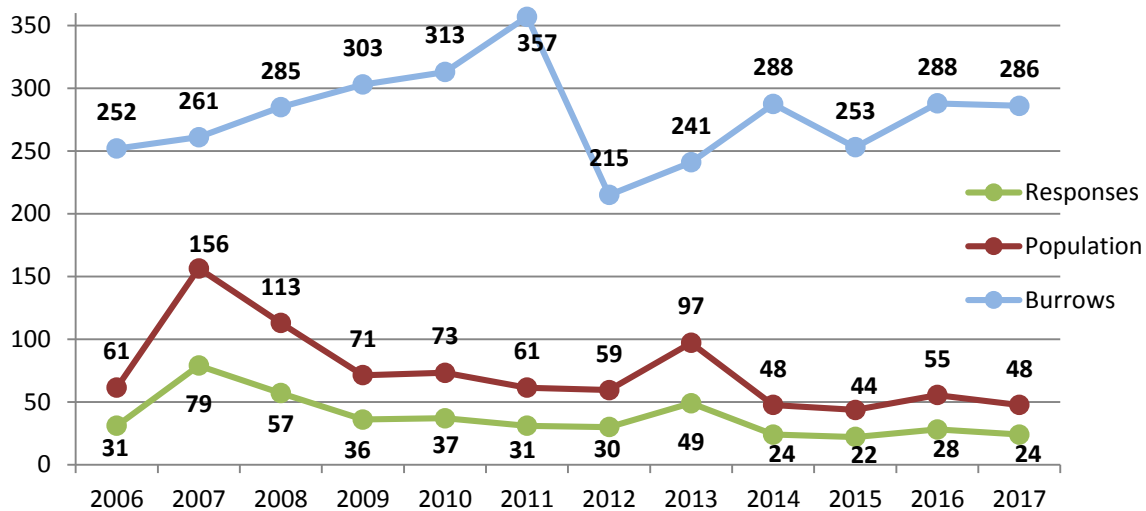


The crash from 2007 numbers was previously attributed to the collapse of many burrows in the more fragile areas of Skokholm, particularly near the Lighthouse which was at one time the densest area of breeding Manx Shearwaters on the Planet (Smith *et al.*, 2001). Although this may certainly



have played a role, it seems unlikely that it would be a major factor as there are considerably more burrows than pairs and the number of burrows appears to fluctuate independently of the number of tape playback responses. The eighth sample plot, begun in 2006, shows nicely the apparent lack of connectivity between the number of burrows and the apparent number of breeding pairs (see graph below). This may be attributable to the number of burrows frequently being altered by Rabbits, the weather, in some areas by Puffins and perhaps most markedly in some places, the digging of non-breeding Manx Shearwaters, particularly later in the season.

**The total number of burrows, responses and the corrected population estimate for the 1000 square metre plot sampled annually since 2006.**



Although the number of birds in the 2006 plot (which lies to the south of North Pond) has seemingly declined since its introduction, this drop has apparently stabilised. The overall number of responses across 8000 square metres was just two down on last year and otherwise the highest since 2008. This was the result of a drop of between three and 11 responses in five plots (the largest decline being along the Quarry Track) and an increase of between four and 12 at three plots (the largest increase coming at Horse Bottom). It would appear that the Skokholm breeding population can still be cautiously regarded as stable, although the observed variance in the percentage of birds which respond to the playback on a given day highlights both the degree of error in these numbers and the importance of continued monitoring (see Brown and Eagle, 2013 and 2014). Further evidence for a stable population comes from the adult ringing programme, with an overall return rate this year of 82.93% compared with 81.27% in 2016, 77.34% in 2015 and 82.27% in 2014. However a decline in the number of shearwater corpses found in recent years may suggest otherwise (see below).

**The estimated number of pairs in the 8000 square metres sampled since 2006.**

| 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 869  | 954  | 620  | 525  | 499  | 495  | 501  | 521  | 477  | 533  | 588  | 585  |

This season saw the final analysis of the 2012-2013 whole Island census data. Although this will be reported upon elsewhere, the result is included here for easy future reference. A total of 63980 breeding pairs was estimated, with a standard error of 8134 and 95% confidence limits putting the actual total somewhere between 48037 and 79923 pairs (Perrins, *pers. comm.*). Even the lowest extreme is up on the 1998 estimate of 46184, although different methodologies were used for each survey.

In the period between 1957 and 1997 the number of dead Manx Shearwaters located on Skokholm was recorded in the daily census log. The corpses were either stored or thrown into the sea to

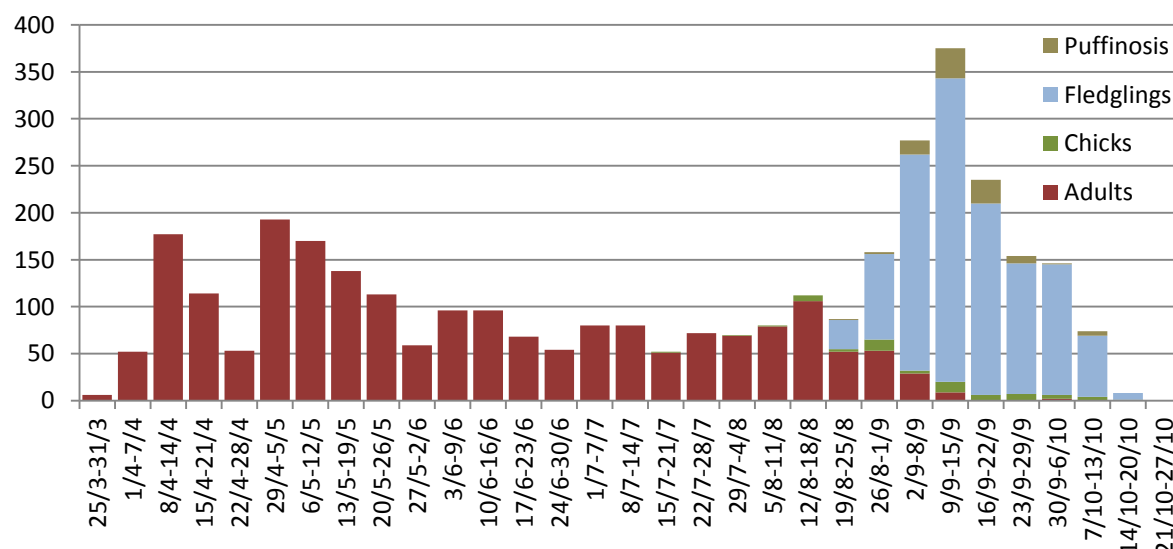
ensure that birds were not counted more than once. The practice was stopped in 1997 as it was felt that the removal of the corpses would be impacting the specialist community of species evolved to exploit this food source. However, with a Great Black-backed Gull population more than twice the size it was when the counting was stopped, the study was begun again in 2014. To limit the impact on the scavenging community, the birds were left in situ but their wings were painted with stock marker so that they were not double counted. This year, as in the previous two, corpses were marked by neatly slicing the flight feathers of both wings with a pair of scissors.

**The number of Manx Shearwater corpses found between 1957 and 1983 from Gynn (1984) plus data from 1984 to 1991 and 2014 to 2017. The number of Great Black-backed Gull breeding pairs is also included for each year.**

|                | 1957 | 1958 | 1959 | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | 1966 |
|----------------|------|------|------|------|------|------|------|------|------|------|
| <b>Corpses</b> | 2465 | 1886 | 924  | 1354 | 1089 | 640  | 688  | 1059 | 857  | 946  |
| <b>GBBGU</b>   | 27   | 30   | 30   | 10   | 12   | 5    | 7    | 12   | 8    | 10   |
|                | 1967 | 1968 | 1969 | 1970 | 1971 | 1972 | 1973 | 1974 | 1975 | 1976 |
| <b>Corpses</b> | 816  | 841  | 829  | 304  | 606  | 1350 | 1082 | 869  | 1051 | 1266 |
| <b>GBBGU</b>   | 10   | 3    | 14   | 11   | 16   | 12   | 12   | 7    | 7    | 7    |
|                | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 |
| <b>Corpses</b> | 1913 | 1820 | 1153 | 1024 | 1080 | 1479 | 1373 | 1316 | 1571 | 1068 |
| <b>GBBGU</b>   | 6    | 10   | 10   | 10   | 11   | 16   | 11   | 14   | 11   | 10   |
|                | 1987 | 1988 | 1989 | 1990 | 1991 | 2014 | 2015 | 2016 | 2017 |      |
| <b>Corpses</b> | 1759 | 1760 | 1694 | 1915 | 2703 | 4272 | 4123 | 3782 | 3449 |      |
| <b>GBBGU</b>   | 11   | 12   | 15   | 16   | 20   | 84   | 83   | 93   | 93   |      |

As might be expected with a larger Great Black-backed Gull breeding population, the number of corpses marked over the last four years has been the most ever. However the average number of corpses per pair has been lower than in all years except 1959 and 1970. One possible explanation for this reduction in kills per pair is that the breeding gulls were routinely disturbed between 1949 and 1985 which, although reducing the number of breeding pairs, probably inflated the non-breeding flock which would still be taking shearwaters.

**The number of Manx Shearwater corpses found during each week from 25<sup>th</sup> March until 27<sup>th</sup> October.**

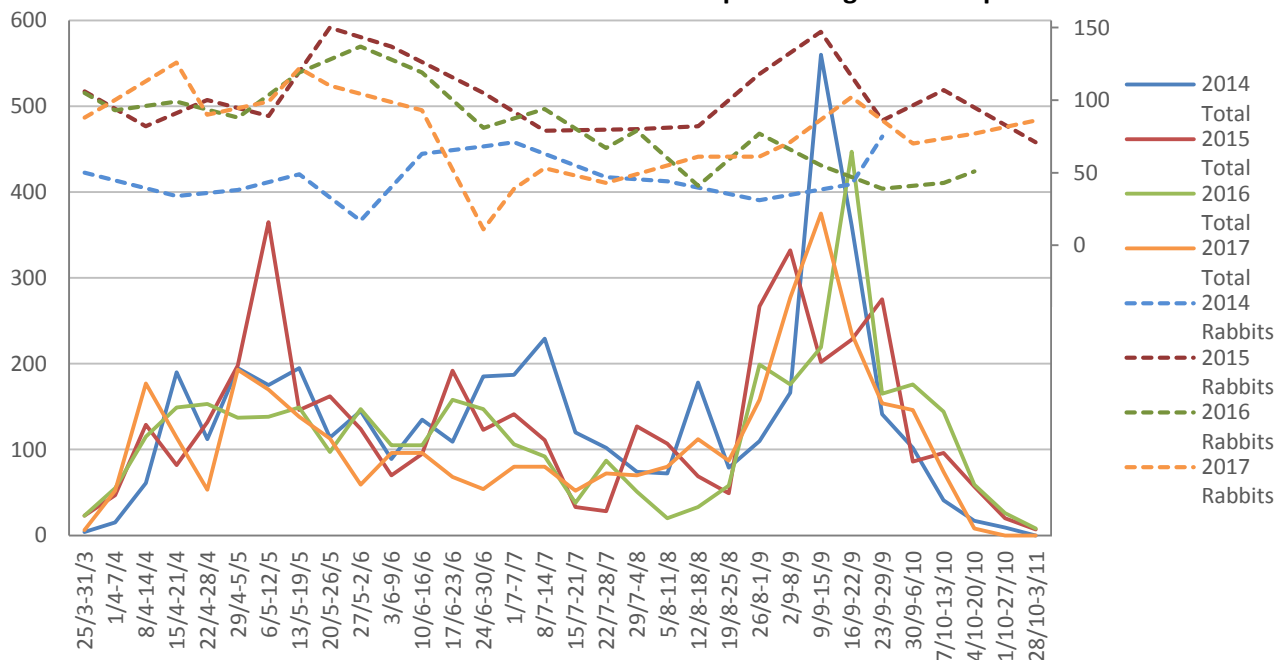


There was a decline in the number of dead Manx Shearwaters located this season, despite the record equalling number of breeding Great Black-backed Gulls. This was primarily due to a significant drop in the number of adult birds located; in 2014 there were 2931 dead adults marked, in 2015

there were 2702, in 2016 there were 2299 and in 2017 there were just 2071 (29.3% fewer than in the record 2014 season). Up until 30<sup>th</sup> June there were only 1389 corpses located this year, 289 fewer than last season. This substantial decline in the number of located corpses could be cause for concern. It would seem likely that the majority of the predated shearwaters are younger, less experienced birds, perhaps those which spend longer on the surface as they prospect for burrows and mates. A reduction in corpses may thus reflect a reduction in the abundance of these younger birds, a decline which would perhaps not be obvious during the playback and study burrow surveys and which could have a substantial effect on the future growth of the population. However there are several other factors which could influence the number of predated shearwaters, perhaps most importantly the size of the Rabbit population (Rabbits being the other main prey item on Skokholm).

The data from the last four years lends some support to this theory, with the North Plain Rabbit population being considerably lower in 2014 when adult mortality was at its highest. However the highest North Plain Rabbit density was observed in 2015, a year which saw considerably more predated shearwaters than in the following two, despite the fact that there were fewer Rabbits in those years. One potential issue with this comparison is that the North Plain Rabbit survey is probably not representative of the Island as a whole, with the effects of Viral Haemorrhagic Disease seemingly differing in different parts of the Island at different times. Despite higher productivity this year (see above), there were 109 fewer fledgling corpses found; although this could perhaps be linked to an increase in fledging period Rabbit numbers compared with 2016, there was higher fledgling mortality in 2015 when the North Plain Rabbit population was higher still. Of course young shearwaters, which provide a considerably larger meal than an adult and which are less experienced on land, may prove to be the preferred prey item for the gulls regardless of the number of Rabbits. The Skokholm Rabbit population has been considerably lower than average during the four years of this carcass marking study; for example in 2013 the highest plot count was 463 on 22<sup>nd</sup> May compared with a maximum count of 150 during the last four years. A return to 2013 Rabbit numbers would provide ideal conditions for monitoring their influence on shearwater predation.

**The total number of Manx Shearwater carcasses found each week 2014-2017 and the number of Rabbits counted in the North Plain census plot during the same period.**



An undergraduate study by Katherine Westerberg and supervised by Dr Stephen Votier, both from the University of Exeter, was undertaken this season to investigate the diet of Great Black-backed

Gulls during the Skokholm breeding season and to assess if pairs exhibit dietary specialisation. This was achieved through the collection and analysis of regurgitated pellets and carcasses found at 26 nest sites around the Island. Pellet collection began during the egg incubation period on 7<sup>th</sup> May and continued until 9<sup>th</sup> July when fledglings had ventured away from nest sites and prey remains could no longer be confidently assigned to a nest. In total, 1035 pellets and 81 carcasses were collected. Birds (primarily Manx Shearwater) and mammals (Rabbit with low levels of Sheep and a Brown Rat) formed the most significant prey sources, making up 48.2% and 38.1% of the average diet. The presence of non-Skokholm mammals and birds, along with refuse (which made up 7.3% of pellets), highlights how some gulls are regularly foraging away from Skokholm. Furthermore there was evidence that dietary specialisation is present in the breeding population of Great Black-backed Gulls on Skokholm, with food sources varying greatly between pairs. Pellets at some nest sites contained almost solely Manx Shearwater, while other pairs were seemingly generalists. Understanding this dietary specialisation will be key to making management decisions in relation to the impact of Great Black-backed Gulls on Manx Shearwaters.

As in 2015, the first fledglings were seen above ground on the night of 21<sup>st</sup> August, two days earlier than in 2016 and 2013 and four days earlier than in 2014. The first fledgling showing symptoms of puffinosis was encountered on 24<sup>th</sup> August, at least five days earlier than in recent years. The number of puffinosised birds found dead has been consistent over the last three years, with 89 this year, 85 in 2016 and 97 in 2015, totals up on the 53 of 2014; it should be noted however that, unlike predated birds which are taken to open areas, puffinosised birds may die deep in the Bracken and thus go undetected. Puffinosis is a mysterious affliction which, possibly due to the actions of a virus which leads to bacterial infection, sees the development of blistered feet, conjunctivitis and problems with limb control; it is often fatal. In an attempt to achieve a better understanding of how puffinosised birds are distributed across Skokholm during the course of the autumn, a transect established in 2015 was walked by Island staff over eight nights during September (see the 2015 report for details of the route). The position of each encountered fledgling was recorded using a GPS unit before it was inspected for signs of puffinosis.

**The number of fledgling Manx Shearwater encountered along the transect between 2017 and 2015, the number which showed signs of puffinosis and the proportion of encountered birds made up of those showing signs.**

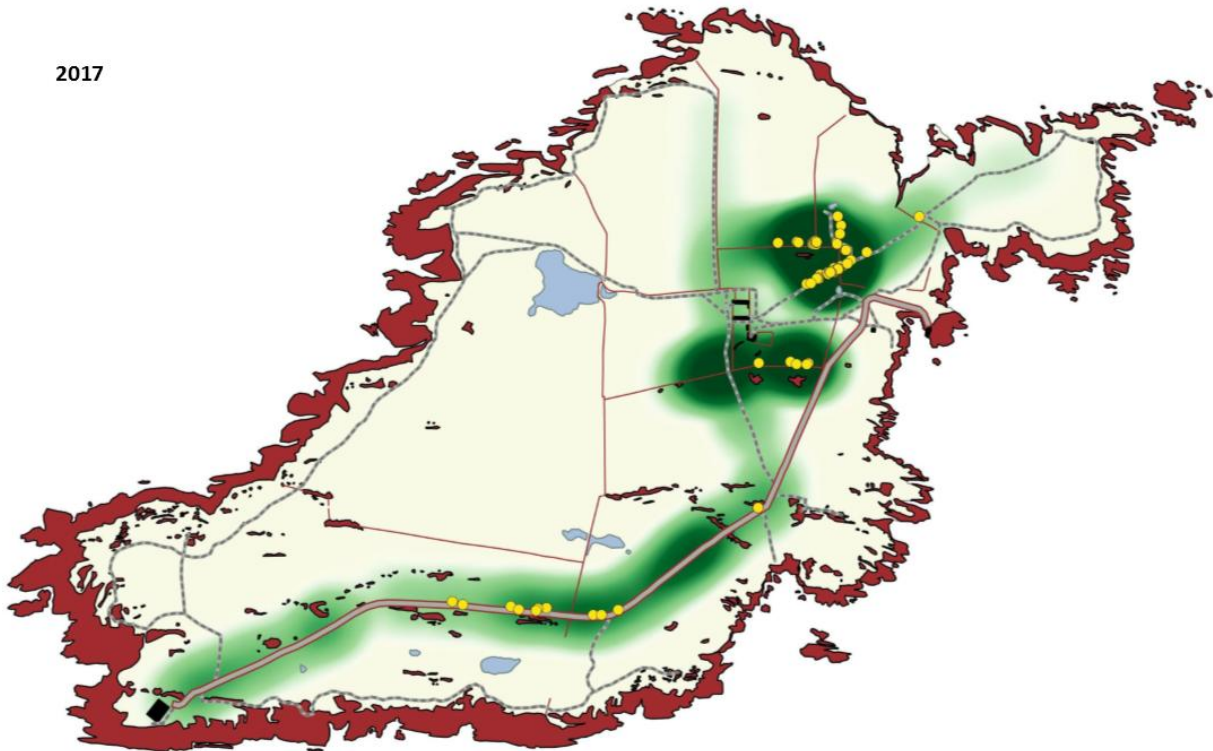
| <b>2017</b>           | <b>1<sup>st</sup>-2<sup>nd</sup></b> | <b>4<sup>th</sup>-5<sup>th</sup></b> | <b>8<sup>th</sup>-9<sup>th</sup></b> | <b>11<sup>th</sup>-12<sup>th</sup></b> | <b>14<sup>th</sup>-15<sup>th</sup></b> | <b>17<sup>th</sup>-18<sup>th</sup></b> | <b>20<sup>th</sup>-21<sup>st</sup></b> | <b>23<sup>rd</sup>-24<sup>th</sup></b> |
|-----------------------|--------------------------------------|--------------------------------------|--------------------------------------|--|--|--|--|--|
| <b>Birds</b>          | 44                                   | 77                                   | 100                                  | 115                                    | 66                                     | 43                                     | 42                                     | 21                                     |
| <b>Puffinosised</b>   | 4                                    | 13                                   | 16                                   | 10                                     | 4                                      | 16                                     | 14                                     | 1                                      |
| <b>% Puffinosised</b> | 9.1                                  | 16.9                                 | 16.0                                 | 8.7                                    | 6.1                                    | 37.2                                   | 33.3                                   | 4.8                                    |
| <b>2016</b>           | <b>2<sup>nd</sup>-3<sup>rd</sup></b> | <b>5<sup>th</sup>-6<sup>th</sup></b> | <b>8<sup>th</sup>-9<sup>th</sup></b> | <b>11<sup>th</sup>-12<sup>th</sup></b> | <b>14<sup>th</sup>-15<sup>th</sup></b> | <b>17<sup>th</sup>-18<sup>th</sup></b> | <b>20<sup>th</sup>-21<sup>st</sup></b> | <b>23<sup>rd</sup>-24<sup>th</sup></b> |
| <b>Birds</b>          | 110                                  | 194                                  | 159                                  | 88                                     | 42                                     | 33                                     | 43                                     | 51                                     |
| <b>Puffinosised</b>   | 20                                   | 18                                   | 22                                   | 13                                     | 8                                      | 5                                      | 5                                      | 6                                      |
| <b>% Puffinosised</b> | 18.2                                 | 9.3                                  | 13.8                                 | 14.8                                   | 19.1                                   | 15.2                                   | 11.6                                   | 11.8                                   |
| <b>2015</b>           | <b>1<sup>st</sup>-2<sup>nd</sup></b> | <b>4<sup>th</sup>-5<sup>th</sup></b> | <b>7<sup>th</sup>-8<sup>th</sup></b> | <b>10<sup>th</sup>-11<sup>th</sup></b> | <b>13<sup>th</sup>-14<sup>th</sup></b> | <b>16<sup>th</sup>-17<sup>th</sup></b> | <b>19<sup>th</sup>-20<sup>th</sup></b> | <b>21<sup>st</sup>-22<sup>nd</sup></b> |
| <b>Birds</b>          | 54                                   | 164                                  | 219                                  | 155                                    | 162                                    | 101                                    | 58                                     | 41                                     |
| <b>Puffinosised</b>   | 3                                    | 29                                   | 63                                   | 31                                     | 55                                     | 55                                     | 32                                     | 10                                     |
| <b>% Puffinosised</b> | 5.6                                  | 17.7                                 | 28.8                                 | 20.0                                   | 34.0                                   | 54.5                                   | 55.2                                   | 24.4                                   |

The number of Manx Shearwater fledglings located along the transect is likely to be different between years, not just because of fluctuations in productivity, but perhaps more critically due to differences in the weather and the moon cycle. In total over the eight visits there were 212 fewer fledglings encountered compared with 2016 and 446 fewer than in 2015. The overall proportion of birds showing signs of puffinosis was similar to last year and well down on 2015, with 15.35% exhibiting signs this year compared with 13.47% in 2016 and 29.14% in 2015. As in previous years,

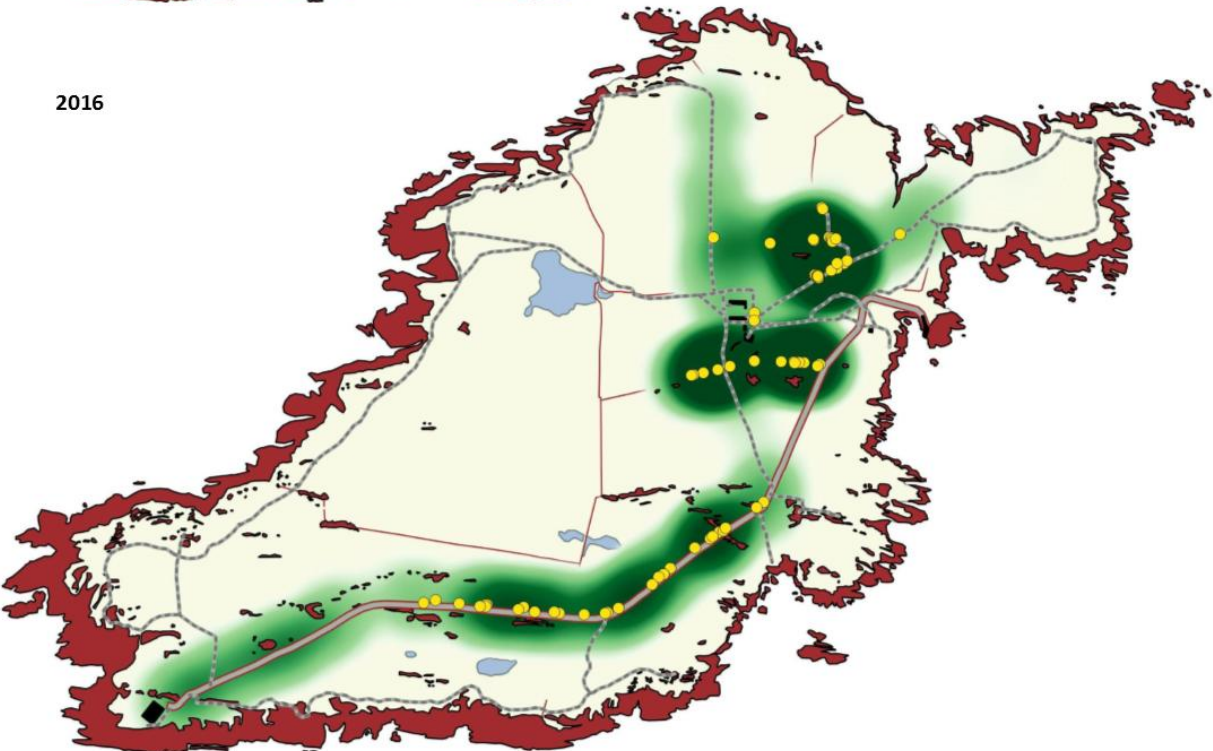
puffinosised birds were primarily distributed in the wetter areas of Skokholm, away from more exposed aspects which also typically lack Bracken. Intriguingly there were no infected birds found along West Knoll Wall, Little Bay Wall or at the crossing of South Pond Lower Drain, all sites which held infected birds in 2016. For the second time in three years, a Crab Bay Plot study chick found along the transect exhibited the symptoms of puffinosis.

**The 2017 and 2016 puffinosis surveys. Manx Shearwater fledgling density is shown in green, with the darker areas around the Well and Knoll Wall holding more birds. Each puffinosised bird encountered over the eight visits is marked by a yellow dot.**

2017



2016



The last two adult birds to be encountered along the study transect were retrapped on 20<sup>th</sup> September, six days before the last of 2016, however a recently predated adult was found on 2<sup>nd</sup> October. September seawatch counts were up on three of the last four years, with a peak of 2260 individuals on the 3<sup>rd</sup>, six further three figure counts logged before the 12<sup>th</sup> (with a high of 663 on the 4<sup>th</sup>) and daily counts of 86 or less until a late peak of 1043 on the 23<sup>rd</sup> when a minimum of 870 passed through Broad Sound. The only seawatching records in October were of 13 on the 1<sup>st</sup> (in two hours 40 minutes) and eight on the 2<sup>nd</sup> (in two hours 30 minutes). A minimum of 12 birds at the Lighthouse after dark on 15<sup>th</sup> October was the last record of the year; there were no November sightings for the first time since 2013 (there have only been November records in eight years since 1927, including the previous three).

**Ringing recovery** EX17685

**Originally ringed** as an adult, LUNDY ISLAND, DEVON 27<sup>th</sup> April 2011

**Recovered** SKOKHOLM 12<sup>th</sup> August 2017

**Finding condition** Dead, eaten by Great Black-backed Gull

**Distance travelled** 74km at 325 degrees (NW)

**Days since ringed** 2299

**Ringing recovery** FC93323

**Originally ringed** as an adult, LUNDY ISLAND, DEVON 27<sup>th</sup> June 1996

**Recovered** SKOKHOLM 16<sup>th</sup> April 2017

**Finding condition** Dead, probably in 2016, leg and ring only

**Distance travelled** 74km at 325 degrees (NW)

**Days since ringed** 7598

**Ringing recovery** FR86417

**Originally ringed** as an adult, LUNDY ISLAND, DEVON 20<sup>th</sup> May 1987

**Recovered** SKOKHOLM 21<sup>st</sup> June 2017

**Finding condition** Dead, ring only found in hole in wall

**Distance travelled** 74km at 325 degrees (NW)

**Days since ringed** 10990

Rats had officially been eradicated on Lundy by 2006 (although the last recorded activity was in February 2004). By 2013 the Manx Shearwater population there had increased by over 3000 pairs. Recoveries from this population are proving to be a more than annual event.



**Ringing recovery** EX28101

**Originally ringed** as a juvenile, FRESHWATER WEST, PEMBROKESHIRE 9<sup>th</sup> September 2011

**Previously recovered** MANX SHEARWATER TRANSECT, SKOKHOLM 5<sup>th</sup> August 2016

**Recovered** MANX SHEARWATER TRANSECT, SKOKHOLM 28<sup>th</sup> July 2017

**Finding condition** At colony but not necessarily breeding

**Distance travelled** 16km at 291 degrees (WNW)

**Days since ringed** 2149

Further evidence that birds which inadvertently reach the mainland after fledging can go on to survive, as long as they make it back out to sea.

**Ringing recovery** EY41935

**Originally ringed** as an adult, MANX SHEARWATER TRANSECT, SKOKHOLM 3<sup>rd</sup> July 2013

**Recovered** PRAIA DO POMPILHO, SERRA GRANDE, BAHIA, BRAZIL 19<sup>th</sup> September 2017

**Finding condition** Dead on beach

**Distance travelled** 8052km at 205 degrees (SSW)

**Days since ringed** 1539

**Ringing recovery** EZ17763

**Originally ringed** as an adult, SKOKHOLM 27<sup>th</sup> June 2016

**Recovered** SACO DA CAPELA, ILHABELA, STATE OF SÃO PAULO, BRAZIL 19<sup>th</sup> October 2017

**Finding condition** Dead on beach, not fresh

**Distance travelled** 9270km at 206 degrees (SSW)

**Days since ringed** 479

There was a single recovery from Brazil in the winter of 2014/15, two from the winter of 2015/16, three from 2016/17 and already two this winter, totals which reflect the increase in the number of Skokholm ringed birds.

**Ringing recovery** EZ53969

**Originally ringed** as a fledgling, SKOKHOLM 6<sup>th</sup> September 2017

**Recovered** PORTREATH, CORNWALL 9<sup>th</sup> September 2017

**Finding condition** Dead on beach

**Distance travelled** 162km at 181 degrees (S)

**Days since ringed** 3

**Storm Petrel** *Hydrobates pelagicus*

**Pedryn Drycin**

**Abundant to Very Abundant Breeder** a 2016 whole Island survey predicted 1910 occupied sites

593 trapped (including 8 pulli), 60 retrapped, 27 controls

1936-1976: 18,526 trapped, 2011-2016: 2543 trapped, 174 retrapped, 97 controls

Despite the sizable breeding population on Skokholm, Storm Petrels again proved a relatively rare sight at sea; there were however more diurnal records than in recent years, all of which are listed here. One went east off the Lighthouse during a strong southerly breeze on 15<sup>th</sup> May, two were seen off the Lighthouse during six hours of observations in a southwesterly near gale on 28<sup>th</sup> July, seven (possibly nine) were logged there during a full day seawatch in similar conditions on 3<sup>rd</sup> August, a remarkable 27 were seen following the potting vessel Boy's Pride as it returned to Milford in a west-southwest moderate breeze on 6<sup>th</sup> August, another was off the Lighthouse on the same day, two lingered around a Grey Seal breaking up a fish below the Lighthouse on the morning of 3<sup>rd</sup> September, a single went through the same afternoon, one headed west into a near gale on 9<sup>th</sup> September and finally another single went west during a northwesterly severe gale the following day. All other observations came at night, with the exception of a small number of incubating adults visible in shallow crevices or in nest boxes. A minimum of 12 birds watched after dark at the Quarry on 20<sup>th</sup> April was the first record of the year, one day later than the first of 2016 and two days earlier than the first of 2015. The first diurnal record was of two vocal birds in the Cottage Garden Wall on 23<sup>rd</sup> April, 15 days earlier than the first diurnal record of last year. Nights in May saw small numbers observed at various locations around the Island and there were counts from the Quarry of at least

100 on the 21<sup>st</sup> and 82 on the 28<sup>th</sup>. A bedraggled bird washed out of the Knoll Wall during very heavy rain on 27<sup>th</sup> June was boxed for drying and released after dark that night.



Four transects established at the Quarry in 2010, along with further plots in North Haven Gully and along two of the walls which radiate from the Farm, seemingly provide a sound method for monitoring changes in the Skokholm population. Between 90 and 130 responses were elicited at these sites in the years 2010 to 2015, however 2016 saw a substantial rock slide significantly reduce the area which could be compared with those years; Quarry transect two, which held between eight and 21 responding birds, was almost entirely destroyed and Quarry transect one was undercut on its southern edge, rendering both transects too dangerous to survey (see the 2016 Seabird Report for photographs and further details). It would seem from the records that the 2016 Quarry rock fall was by far the largest such event for over 30 years. Visits to the Quarry this season established that there had been no further significant slides on any of the transects and the decision was made to reinstate transect one entirely and to use the upper section of transect two. It was originally intended that an analysis of the 2010 to 2015 data would allow us to deduce how many birds had been present in just the upper section of transect two and allow a direct comparison to be made with this year, however it became apparent that there were considerably more birds in this upper area in 2016, perhaps due to the rock fall displacing birds from further down. It was therefore decided that all of the data previously collected for transects one and two would be compared with this and future years, but it is noted here that transect two has been shortened and that one and two were missed in 2016.

We were not joined by a long-term Storm Petrel researcher this year, however undergraduate researcher Katherine Westerberg accompanied staff and long-term volunteers to allow the survey



work to be completed in the usual period. Ten visits were made to the study areas between 9<sup>th</sup> June and 10<sup>th</sup> July. A recording of male song was played into every crevice encountered along the transects, both numbered (and therefore used previously) and unmarked, with each crevice from which a response was elicited being recorded and marked if new. It was first noted in 2013 how some marked burrows had deviated from the two metre wide transects and in 2014 the data collected since 2010 was reassessed to bring it back in line with the original protocol. As has been the case since 2014, the playback census this year was focused on the area of the transects delineated by marked burrows, although the results were then divided into those which fell within the true two metre transect and those which fell just outside (see table below).

**The total number of apparently occupied crevices (located over ten visits) responding to a recording of male song at each of the seven study sites. Numbers in parenthesis are the totals from the 2m wide Quarry transects (as stipulated in the project guidelines) as opposed to the more wayward crevices included since the project's inception. The mean is that from 2010-2017.**

| Year | North Pond Wall | Little Bay Wall | North Haven Gully | Quarry transect 1 | Quarry transect 2                | Quarry transect 3 | Quarry transect 4 | Quarry total | Total    |      |      |      |      |       |      |
|------|-----------------|-----------------|-------------------|-------------------|----------------------------------|-------------------|-------------------|--------------|----------|------|------|------|------|-------|------|
| 2017 | 7               | 20              | 14‡               | 15 (5)            | 13 <sup>†</sup> (7) <sup>†</sup> | 10 (9)            | 48 (27)           | 86 (48)      | 127 (89) |      |      |      |      |       |      |
| 2016 | 6               | 15              | 17                | 9* (4)*           | ** **                            | 11 (8)            | 41 (26)           | 61 (38)      | 99 (76)  |      |      |      |      |       |      |
| 2015 | 7               | 17              | 17                | 14 (5)            | 21 (9)                           | 12 (7)            | 42 (25)           | 89 (46)      | 130 (87) |      |      |      |      |       |      |
| 2014 | 9               | 12              | 13‡               | 14 (5)            | 18 (9)                           | 18 (12)           | 37 (22)           | 87 (48)      | 121 (82) |      |      |      |      |       |      |
| 2013 | 8               | 15              | 22                | 14 (4)            | 15 (8)                           | 10 (7)            | 46 (27)           | 85 (46)      | 130 (91) |      |      |      |      |       |      |
| 2012 | 5               | 9               | 21                | 12 (5)            | 8 (4)                            | 10 (5)            | 33 (17)           | 63 (31)      | 98 (66)  |      |      |      |      |       |      |
| 2011 | 7               | 5               | 19                | 11 (5)            | 13 (8)                           | 10 (7)            | 25 (14)           | 59 (34)      | 90 (65)  |      |      |      |      |       |      |
| 2010 | 4               | 9               | 18                | 8 (5)             | 15 (12)                          | 11 (8)            | 30 (17)           | 64 (42)      | 95 (73)  |      |      |      |      |       |      |
| Mean | 6.6             | 12.8            | 17.6              | 12.1              | 4.8                              | 14.7              | 8.1               | 11.5         | 7.9      | 37.8 | 21.9 | 74.3 | 41.6 | 111.3 | 78.6 |

\* Transect 1 was only visited on four occasions due to safety concerns.

\*\* Transect 2 was not visited in 2016 due to a rock fall.

† Transect 2 was shortened in 2017 due to the 2016 rock fall.

‡ There was substantial scouring in the winters of 2013-14 and 2016-17 and during Ophelia.

One of the most striking increases logged this year was along Little Bay Wall where responses were elicited at an extra five crevices. There is a general consensus that the number of pairs utilising the 18<sup>th</sup> century herringbone walls on Skokholm has declined (Vaughan and Gibbons, 1996; Vaughan, 2001; Thompson, 2003; Sutcliffe, 2010), perhaps due to a loss of suitable nest sites as vegetation and soil fills gaps in the collapsing walls. There is however pleasing evidence here that this decline has currently halted and numbers, at least along Little Bay Wall, are gradually increasing (although see discussion below regarding a decline in the Walls response rate this year).

There was further substantial scouring in North Haven Gully during the winter of 2016-2017, with several boulders in the lower section being relocated, an event which destroyed crevices and moved painted markers away from their original locations. As was the case following the last major change to the North Gully boulder slope, a below average number of responses were elicited this season (with three fewer sites found than in 2016 and 3.6 fewer than the eight year mean). The largest drop in numbers observed during the last eight years came in 2014 following storms during the previous winter, storms which removed 21 of the crevices occupied between 2010 and 2013 (and 16 of those occupied in 2013). The huge swell caused by Storm Ophelia (the remnants of the easternmost major Atlantic hurricane on record) on 16<sup>th</sup> October this year made further alterations to the North Gully landscape, entirely removing boxes installed by Whittington in 2014, the access ladder to the lower portion of the slope and the central section of boulder scree which traditionally held many active crevices (see photograph below). It would seem likely that North Gully will again hold a below average number of pairs next year.



Owing to the loss of Quarry transect two and a reduced number of visits to transect one, the number of active crevices located last year was the lowest since 2012. Transect one was accessible for the full ten visits this season and a cumulative five responses were elicited, matching that observed in 2015 and in five of seven previous survey years. Despite the shortening of transect two, seven responses was only two down on the 2015 and 2014 totals and 13.6% down on the mean. Transects three and four were both very similar to last year, with one extra site found along each two metre transect and both were up on the mean. Overall there were ten more active sites at the Quarry this year (primarily due to the visits to transects one and two) and a cumulative total of 48 responding sites matched 2014 as the highest total of the last eight years (15.4% up on the eight year mean).

**The number of crevices which have at some point been occupied over the eight year study (a total of 283), subdivided to show how many years the crevices have been apparently occupied for and the percentage of crevices occupied for a particular number of years.**

|                               | Quarry<br>Transects | The<br>Walls | North Haven<br>Gully | Total      | % of<br>total |
|-------------------------------|---------------------|--------------|----------------------|------------|---------------|
| 1 year of apparent occupancy  | 43                  | 24           | 29                   | 96         | 33.92         |
| 2 years of apparent occupancy | 24                  | 18           | 7                    | 49         | 17.32         |
| 3 years of apparent occupancy | 7                   | 5            | 7                    | 19         | 6.71          |
| 4 years of apparent occupancy | 28                  | 10           | 8                    | 46         | 16.25         |
| 5 years of apparent occupancy | 14                  | 1            | 4                    | 19         | 6.71          |
| 6 years of apparent occupancy | 26                  | 1            | 4                    | 31         | 10.95         |
| 7 years of apparent occupancy | 7                   | 1            | 1                    | 9          | 3.18          |
| 8 years of apparent occupancy | 12                  | 1            | 1                    | 14         | 4.95          |
| <b>Total</b>                  | <b>161</b>          | <b>61</b>    | <b>61</b>            | <b>283</b> |               |

Overall there were 89 responses elicited this year, two more than in 2015 (the year before the Quarry rock fall), only two less than in the record year of 2013 and 13.2% more than the eight year mean. It seems likely that the Skokholm study population can still be regarded as stable, a conclusion which is probably applicable to the Island population as a whole. This is positive news following what may have been a significant population decline between 1996 and 2010 (Sutcliffe and

Vaughan, 2011, Wood *et al*, 2017). It is clear that some Storm Petrel nest crevices can be short lived (a third of those found over the course of this study have only been occupied for one year), however there also seems to be evidence here that the birds react to the changing landscape and maintain a stable population; this of course assumes that further nest sites open up as others are lost. Stable sites are also in existence; over a quarter of the active crevices located during this eight year study have shown signs of occupancy in five or more years and 4.95% of crevices have contained a calling bird in every year.

The percentage of known active Wall crevices which responded to a recording of male song during any single visit was considerably down on the previous three years; whereas between 28.7% and 40.0% of active Wall burrows have responded in the past, this season saw only 21.9% respond. This may be cause for concern as it perhaps suggests that the active crevices were occupied less frequently, hinting at an increase in the number of crevices occupied by non-breeders (birds which may leave a crevice unattended or occupy multiple crevices during the study period). Although of course more non-breeders could be a positive sign for the future, it should thus be noted that the above figures suggestive of a stable or increasing Walls population are open to interpretation. In areas of rock fall (in the Quarry and North Haven Gully) the proportion of active crevices which responded on any single visit fell within that recorded in previous years (see table below) and the average response rate fell just below the relatively tight spread observed during the same period (between 27.1% and 30.1% of active crevices have responded over the last four years). Although this overall response rate has proven consistent between years, there is considerable variation over the ten visits; on one occasion there were no responses from the Walls and on another there were 13, whilst the number of responses at North Haven varied between two and six and at the Quarry between 15 and 45. Despite the observed variation, the use of response rates to produce a correction factor remains the best way to predict the number of birds present in a large area when ten visits are not logistically feasible (for example during the whole Island census). However the uncertainty surrounding this year's figures is a reminder of how difficult it is to assess the breeding population of a species which usually cannot be seen.

**The percentage of known active crevices which responded to male song during any single visit, averaged across all visits (the resulting correction factor is given in parenthesis).**

| Year | The Walls   | North Haven | Quarry      | Rock fall   | Average     |
|------|-------------|-------------|-------------|-------------|-------------|
| 2017 | 21.9 (4.58) | 30.9 (3.23) | 28.1 (3.55) | 28.5 (3.51) | 27.1 (3.69) |
| 2016 | 40.0 (2.50) | 25.9 (3.86) | 23.3 (4.30) | 23.9 (4.18) | 27.7 (3.61) |
| 2015 | 28.7 (3.48) | 37.4 (2.68) | 28.9 (3.46) | 30.4 (3.29) | 30.1 (3.33) |
| 2014 | 36.2 (2.76) | 40.0 (2.50) | 26.2 (3.82) | 26.4 (3.79) | 28.1 (3.56) |

There is an obvious need to know what responding birds are actually doing; it is unclear how many of the 1910 active sites predicted in last year's whole Island census were actually occupied by breeding birds. Given that previous attempts to use an endoscope in natural sites have failed, one way to improve our knowledge is to encourage petrels to occupy accessible artificial nest sites. With this in mind a study wall containing 119 nest holes was created during the 2016 season (with the final inspection hatches and endoscope holes being added in April 2017). This season saw the regular use of MP3 playback in an attempt to lure prospecting petrels into the crevices and on 10<sup>th</sup> July this proved successful when a bird twice entered the wall. However no birds responded from the 'Petrel Station' during the playback survey period and the dream of having a study population with which to check the breeding status of responding birds is some way from becoming reality.

In 2013 a thermal imaging camera recorded a Short-eared Owl hunting Storm Petrels in the Quarry, an event which is seemingly becoming more regular. The remains of six petrels were found that year, with 16 in 2014, 18 in 2015 and 51 in 2016, the vast majority of which were believed to be owl

victims. This season there were 98 corpses located between 23<sup>rd</sup> April and 14<sup>th</sup> October (the latter one of two juveniles found dead); although five were certainly taken by Great Black-backed Gulls (as the corpses were found in their pellets or nests), the majority of birds were again thought to have fallen prey to Short-eared Owls (due to the presence of feathers or pellets near the bodies). The increase in the number of corpses found this season is primarily due to the presence, for the first time on record, of a breeding pair of Short-eared Owls on Skokholm. Breeding was confirmed when an owl was flushed from a single egg on 21<sup>st</sup> April and a visit on 21<sup>st</sup> May revealed four chicks, a failed egg and a nest littered with Storm Petrel feathers and a headless corpse (photograph below). Four owlets were still alive on 21<sup>st</sup> June (although one was considerably smaller than its siblings), the smallest of the three large chicks was still alive on 21<sup>st</sup> June and at least two ringed fledglings were at the Hills on 15<sup>th</sup> July. There were no sightings of Short-eared Owl between 22<sup>nd</sup> July and 1<sup>st</sup> September, only two records in October (including a high of three on the 29<sup>th</sup>) and a single in November, however 14 freshly predated Storm Petrels were found during the same period. Both breeding adults were surprisingly dark of face, probably due to oil regurgitated by Storm Petrels.



There were 14 sites discovered this season where an incubating bird was evident early enough in the nesting period to allow a productivity estimate to be made (12 sites in 2016, 20 in 2015 and 13 in 2014); four traditional sites used last year for the BTO tracking project were not occupied this year. Although some early egg stage failures may have been missed, the study is biased towards birds in shallow crevices or boxes and the sample size is far from great, these visible birds provide a rare opportunity to estimate productivity on Skokholm. Of the 14 monitored nests, two failed at egg stage, four failed at either egg or very small chick stage and one failed at chick stage; productivity was thus calculated at 0.50 fledglings per pair, a figure similar to the 0.58 observed last season and the 0.55 logged in 2015 but down on the 0.69 recorded in 2014. The first hatched eggshell was found on 3<sup>rd</sup> July this year, 14 days earlier than the first of 2016 and one day later than in 2015, whilst another adult was still incubating on 13<sup>th</sup> August. This latter attempt was still ongoing when staff left the Island on 9<sup>th</sup> November, although by this time the chick had attained a wing chord of 101mm and was considered large enough that it would go on to fledge.

Although only small numbers of accessible chicks are ringed each year on Skokholm, tape luring of adult birds in South Haven is giving some indication as to their post-fledging survival. Of 31 chicks ringed between 2013 and 2015, six (19.35%) have been mist netted in South Haven in subsequent years (at between one year, 323 days and two years, 350 days later). Intriguingly 12 of the 31 were ringed at either the Quarry or Wall's End and have not been encountered again; although this may infer differing survival rates, it is perhaps more likely that young non-breeders return to sites close to their natal crevice, in this instance sites far enough from the South Haven tape lure that birds are not attracted. If the Quarry and Wall's End birds are removed from the equation, six of 19 birds (31.58%) have been reencountered. If only the 2014 data is used, three of seven chicks have survived for at least one year, 323 days since being ringed (42.86%).



Adult Storm Petrels were mist netted on four nights between the 23<sup>rd</sup> and 28<sup>th</sup> May in an attempt to retrieve the BTO tracking devices fitted in 2016; an MP3 playback lure was not used on these occasions. Additionally birds were lured to the traditional South Haven netting site on nine nights between 24<sup>th</sup> July and 7<sup>th</sup> September, one more night than in 2016 but two fewer than in 2015. Disappointingly all but three dates during the peak trapping period of 15<sup>th</sup> July to 7<sup>th</sup> August were missed due to the weather conditions prevalent at the time. The largest catch was the 252 trapped on the night of 24<sup>th</sup> July (up on 247 on the night of the 22<sup>nd</sup> in 2016). Of 672 adults handled this year, 12.9% were already wearing a ring (6.8% in 2016, 12.3% in 2015, 7.5% in 2014), there were two retraps from 2013, six from 2014, five from 2015, 15 from 2016 and 27 (4.02%) had been ringed elsewhere (3.03% in 2016, 3.45% in 2015). Along with generating some fantastic data, these nights also proved very popular with guests to the Island. Unless stated otherwise, all of the following recoveries were of birds deliberately mist netted. Additional to the birds listed below, we received news of two birds ringed at Wooltack Point (4km to the NNE) retrapped on Skokholm (one of which was ringed in 2001 and retrapped 5778 days later, one of which was retrapped 381 days later), one bird ringed on Skokholm and retrapped on Wooltack (after 326 days), two birds ringed on Skomer (4km to the NNW) retrapped on Skokholm (after three and 13 days) and three birds ringed on Skokholm and retrapped on Skomer (after one, four and 17 days).

**Ringing recovery 2513380**

**Originally ringed** as an adult, STRUMBLE HEAD, PEMBROKESHIRE 30<sup>th</sup> July 2010

**Recovered** SOUTH HAVEN, SKOKHOLM 25<sup>th</sup> May 2017

**Finding condition** This bird was not tape lured and is probably a Skokholm breeder  
**Distance travelled** 40km at 202 degrees (SSW)  
**Days since ringed** 2491

**Ringing recovery** 2534993  
**Originally ringed** as an adult, CAPE CLEAR, CORK, IRELAND 4<sup>th</sup> July 2017  
**Recovered** SOUTH HAVEN, SKOKHOLM 7<sup>th</sup> August 2017  
**Distance travelled** 294km at 85 degrees (E)  
**Days since ringed** 34

**Ringing recovery** 2633281  
**Originally ringed** as an adult, CALF OF MAN, ISLE OF MAN 13<sup>th</sup> July 2017  
**Recovered** SOUTH HAVEN, SKOKHOLM 10<sup>th</sup> August 2017  
**Distance travelled** 263km at 187 degrees (S)  
**Days since ringed** 28  
Adult 2706631 made the reverse journey, reaching the Calf from Skokholm in 343 days from 14<sup>th</sup> August 2016.

**Ringing recovery** 2637108  
**Originally ringed** as an adult, ST JUSTINIAN, ST DAVID'S, PEMBROKESHIRE 30<sup>th</sup> July 2016  
**Recovered** SOUTH HAVEN, SKOKHOLM 25<sup>th</sup> July 2017  
**Distance travelled** 19km at 170 degrees (S)  
**Days since ringed** 360  
Amazingly 2637490, ringed at the same site on the same night, also reached Skokholm on 25<sup>th</sup> July (360 days later). Additionally 2637483, ringed at the same site one day earlier, reached Skokholm on 6<sup>th</sup> September 2017 (404 days later).

**Ringing recovery** 2647667  
**Originally ringed** as an adult, BARDSEY ISLAND, GWYNEDD 15<sup>th</sup> July 2016  
**Recovered** SOUTH HAVEN, SKOKHOLM 8<sup>th</sup> August 2017  
**Distance travelled** 122km at 196 degrees (SSW)  
**Days since ringed** 389

**Ringing recovery** 2655562  
**Originally ringed** as an adult, HARTLAND POINT, DEVON 8<sup>th</sup> July 2016  
**Recovered** SOUTH HAVEN, SKOKHOLM 12<sup>th</sup> August 2017  
**Distance travelled** 95km at 326 degrees (NNW)  
**Days since ringed** 400

**Ringing recovery** 2674671  
**Originally ringed** as an adult, MWNT, CEREDIGION 20<sup>th</sup> June 2017  
**Recovered** SOUTH HAVEN, SKOKHOLM 25<sup>th</sup> July 2017  
**Distance travelled** 65km at 223 degrees (SW)  
**Days since ringed** 35  
Adult 2721405 made the same journey in three days between the 22<sup>nd</sup> and 25<sup>th</sup> July 2017 and 2721410 made it in ten days between 26<sup>th</sup> July and 5<sup>th</sup> August 2017.

**Ringing recovery** 2685661  
**Originally ringed** as an adult, SOUTH HAVEN, SKOKHOLM 22<sup>nd</sup> July 2014  
**Recovered** BARDSEY ISLAND, GWYNEDD 30<sup>th</sup> May 2017  
**Distance travelled** 122km at 16 degrees (NNE)  
**Days since ringed** 1043

Additionally 2706312 made the same journey between 24<sup>th</sup> July 2016 and 6<sup>th</sup> July 2017 (347 days), as did 2706368 between 24<sup>th</sup> July 2016 and 30<sup>th</sup> May 2017 (310 days). The same locations were also visited by 2706477 between 26<sup>th</sup> July 2016 and 7<sup>th</sup> July 2017 (346 days), with this latter bird being retrapped at St Justinian, St David's on 30<sup>th</sup> July 2016 (four days after Skokholm).

**Ringing recovery 2699028**

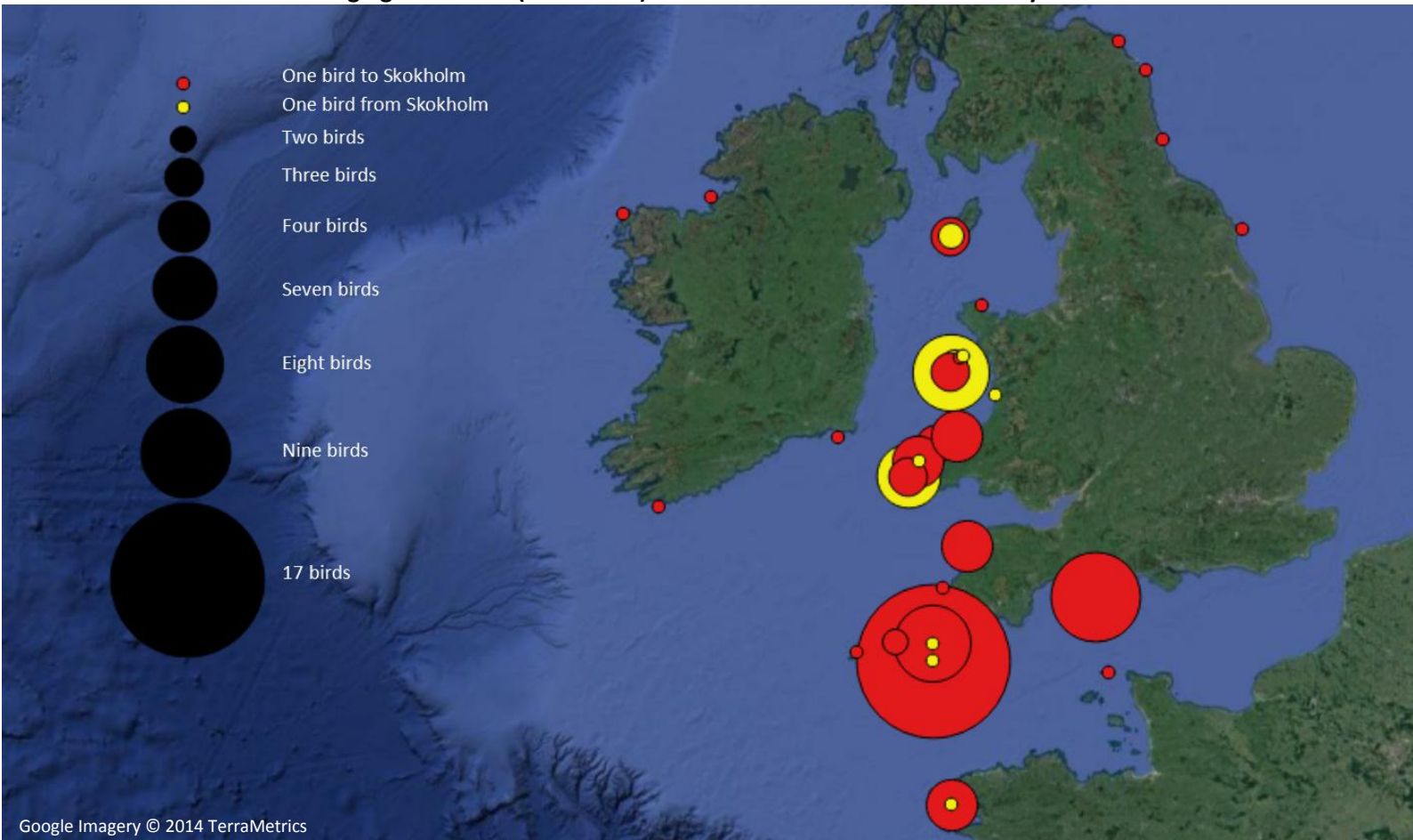
**Originally ringed** as an adult, PORTLAND BILL, DORSET 28<sup>th</sup> June 2016

**Recovered** SOUTH HAVEN, SKOKHOLM 5<sup>th</sup> August 2017

**Distance travelled** 238km at 304 degrees (NW)

**Days since ringed** 403

**Storm Petrel ringing recoveries (over 10km) received since the Bird Observatory was reaccredited.**



**Ringing recovery 2705851**

**Originally ringed** as an adult, SOUTH HAVEN, SKOKHOLM 12<sup>th</sup> August 2015

**Recovered** BANNEG, LE CONQUET, FINISTÈRE, FRANCE 9<sup>th</sup> June 2016

**Distance travelled** 366km at 177 degrees (S)

**Days since ringed** 302

Additionally FRP SE23385, ringed at Banneg on 7<sup>th</sup> August 2013, was found dead in the Quarry on 17<sup>th</sup> July 2016 (1075 days later); there was no obvious cause of death. Along with the islands of Balaneg and Trielen, Banneg forms part of the Iroise Nature Reserve within the Molène Archipelago, the most westerly islands of France. Banneg is the largest Storm Petrel colony in the country, thought to be home to just under a thousand pairs which primarily nest in abandoned Rabbit burrows. Intriguingly this nesting habitat was not found to be in use on Skokholm during the 2016 whole Island census.

**Ringing recovery 2706465**

**Originally ringed** as an adult, SOUTH HAVEN, SKOKHOLM 26<sup>th</sup> July 2016

**Recovered** HOT POINT, THE LIZARD, CORNWALL 22<sup>nd</sup> June 2017

**Distance travelled** 193km at 178 degrees (S)

**Days since ringed** 331

The reverse journey was made by 2714489 ringed on 4<sup>th</sup> July 2016 and controlled on Skokholm 25<sup>th</sup> August 2017 (417 days later), by 2726026 ringed on 6<sup>th</sup> July 2016 and controlled on the 6<sup>th</sup>, 8<sup>th</sup> and 11<sup>th</sup> August 2017 (396 to 401 days later), by 2726155 ringed on 26<sup>th</sup> June and controlled on the 8<sup>th</sup> and 10<sup>th</sup> August 2017 (43 and 45 days later), by 2726169 ringed on 5<sup>th</sup> July and controlled on 10<sup>th</sup> August 2017 (36 days later) and by 2726240 ringed on 1<sup>st</sup> August and controlled on 8<sup>th</sup> August 2017 (seven days later).

**Puffin *Fratercula arctica***

**Pâl**

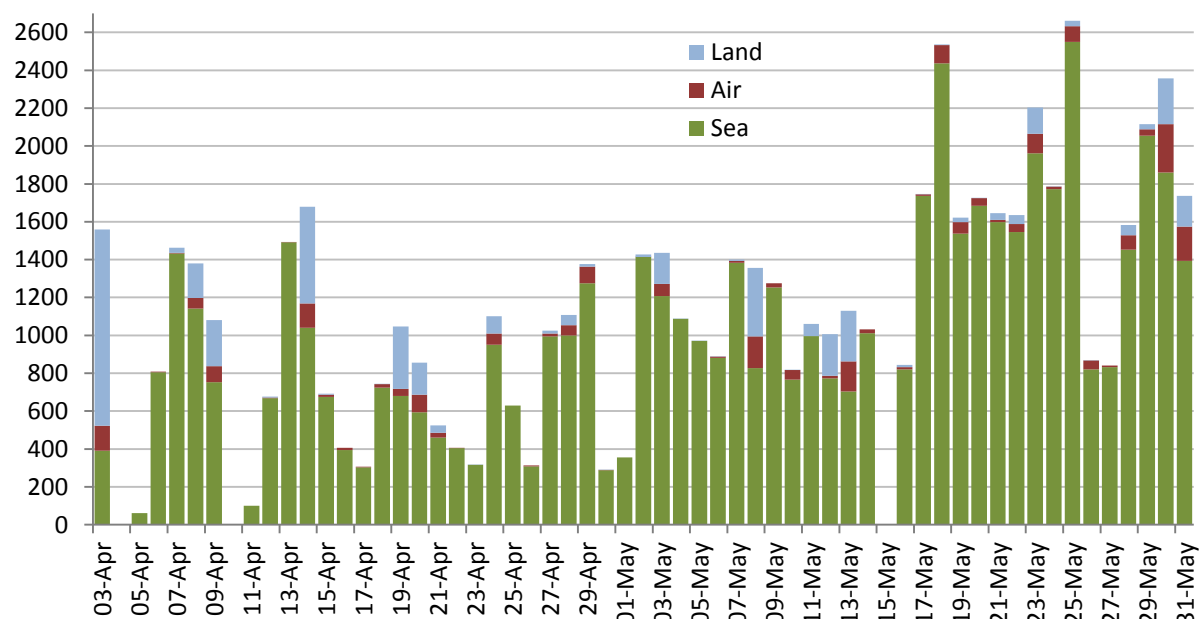
**Very Abundant Breeder**

30 trapped (including 3 pulli), 2 retrapped

1936-1976: 5411 trapped, 2011-2016: 467 trapped, 15 retrapped, 1 control

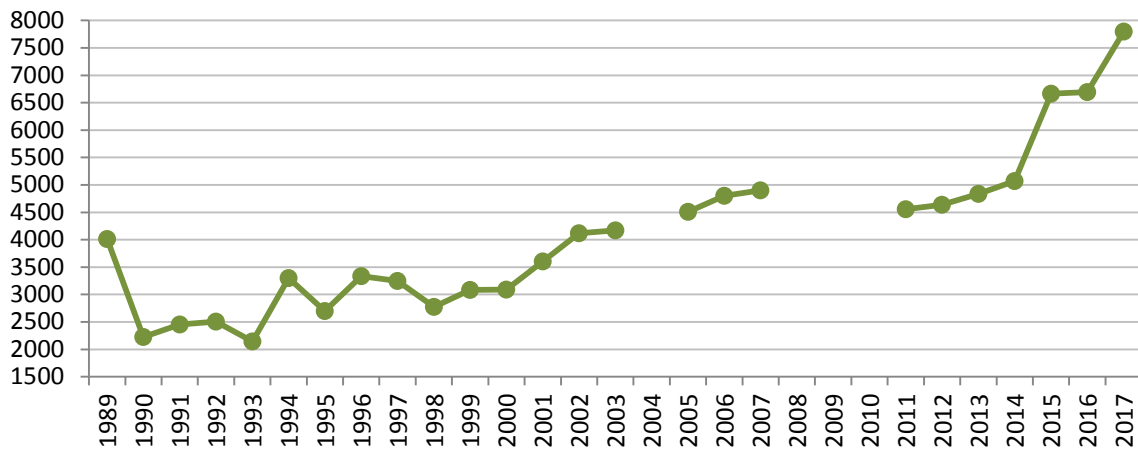
Four birds drifting offshore on 14<sup>th</sup> March (two off the Lighthouse, one off the Quarry and one off the Bluffs) were the first of the season. Although one day later than the first of last year these were otherwise, equal with 12 in 2010 and five in 1993, the earliest since 28 were logged on 26<sup>th</sup> February 1983. The March total of 9164 proved the second highest since 1960, only down on the 2012 total of 12074. The bulk of the March total was made up of raft counts of 1022 on the 23<sup>rd</sup>, 3411 on the 17<sup>th</sup>, 1635 on the 28<sup>th</sup> and 1285 on the 29<sup>th</sup>, with the former count including at least 50 birds which landed in South Haven that evening; a 23<sup>rd</sup> March landfall was eight days earlier than in 2016 and between eight and 14 days earlier than in the three years prior to that, but three days later than in 2012. April counts varied dramatically with totals of 3396 on the 1<sup>st</sup>, 2883 on the 7<sup>th</sup> and 2986 on the 14<sup>th</sup>, but lows of four on the 4<sup>th</sup>, 67 on the 5<sup>th</sup> and 138 on the 10<sup>th</sup>. Although the peak counts logged in April were thus well down on last year, the cumulative monthly total of 45011 was only 528 birds down. Daily counts were made from around the Neck each evening, from 3<sup>rd</sup> April until 31<sup>st</sup> May, to record the pattern of colony attendance (see chart below).

**The number of Puffins seen from the Neck between 3<sup>rd</sup> April and 31<sup>st</sup> May 2017. The transect again began from a line due north of North Haven and finished at Peter's Bay. There was no count on 15<sup>th</sup> May due to the weather.**



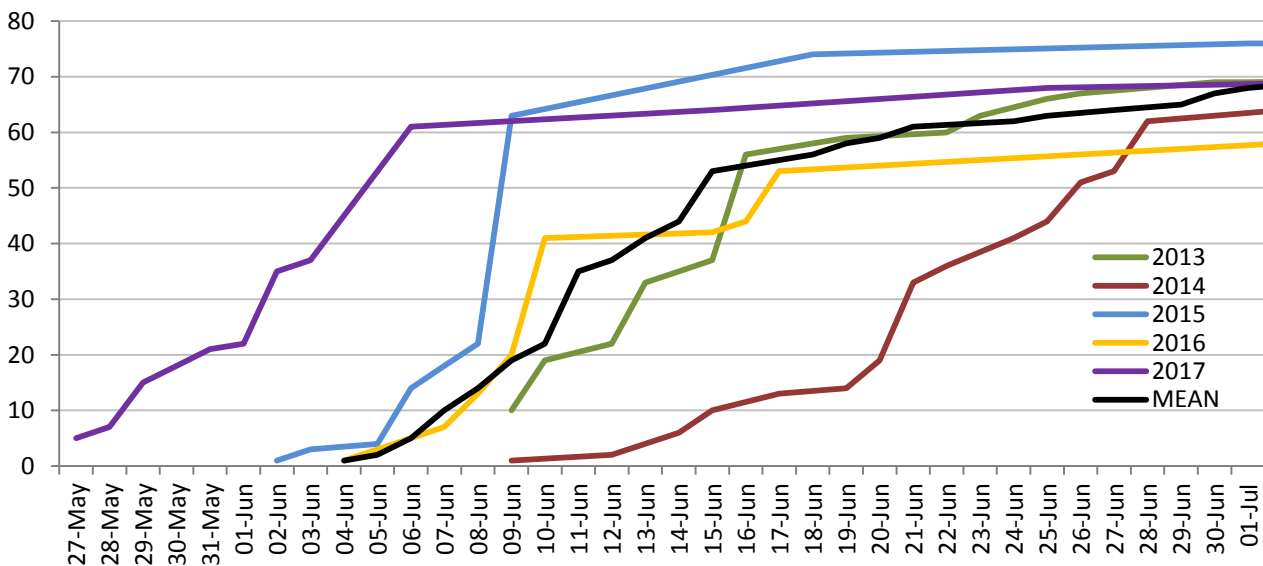


The maximum number of Puffins recorded each spring during the period 1989-2017.



It proved to be the first year of the last four where a whole Island count did not coincide with the highest April or May count from the Neck, however the 2536 birds logged at the Neck on the evening of 18<sup>th</sup> May (the date of the maximum 2017 whole Island count), was only 125 birds down on the 25<sup>th</sup> May Neck count. The whole Island count of 7800 logged on the 18<sup>th</sup> (with 2531 birds to the south and 2733 to the north, in addition to the Neck count), was 16.6% up on the 2016 total and the highest spring count since the early 1950s (when a minimum of 10000 was logged on 22<sup>nd</sup> April 1953 and 25<sup>th</sup> May 1951); numbers are however still well down on Lockley's pre-War spring estimates of approximately 40000. Although the whole Island counts provide a relatively consistent long-term method for monitoring the trend in numbers, how the totals reflect the Skokholm breeding population is difficult to ascertain. The Crab Bay count for the evening of 18<sup>th</sup> May was 996 birds, however more focused monitoring at this site revealed a study population of 69 burrows in an area which comprises approximately 10% of the colony and where less than half of the active burrows in that area were study burrows; thus we might predict a very rough minimum of 1380 pairs for Crab Bay (as active burrow distribution is apparently quite even) and expect more than twice the number of birds to be using this area of sea than were logged during the peak whole Island count.

The number of study burrows which had been provisioned with fish by a particular date.



A productivity plot established at Crab Bay in 2013 was used for a fifth season. The majority of the 100 burrows individually numbered in 2013 were again used this year, although a small number of posts lost during the winter had to be repositioned, as did three where further excavations had

made it difficult to tell which burrow a bird was entering. Of these, 69 were seen to be occupied and were visible throughout the season (66 in 2016); productivity estimates are based on observations of these burrows. Four active burrows (5.80%) were not seen to be provisioned with fish and it is assumed that these failed at egg stage (7.58% in 2016, 5.00% in 2015, 6.58% in 2014). The first fish delivery witnessed anywhere this year was on 24<sup>th</sup> May (29<sup>th</sup> May in 2016, 31<sup>st</sup> May in 2015, 3<sup>rd</sup> June in 2014 and 30<sup>th</sup> May in 2013), but it was not until 27<sup>th</sup> May that fish were seen to be brought to the study plot (4<sup>th</sup> June in 2016, 2<sup>nd</sup> June in 2015 and 9<sup>th</sup> June in 2014 and 2013). Despite the very early start to the 2017 chick feeding period, the pattern of fish delivery was rather typical with over half of the study burrows being provisioned within a week of the first delivery to the plot. Indeed the cumulative number of burrows which had been provisioned remained approximately nine days ahead of the five year mean. The 2017 chick feeding period was over two weeks earlier than in 2014, the breeding season which followed the most severe winter storms recorded during this study.



**Calculating productivity using only three daylight watches. The first watch was between the 6<sup>th</sup> and 28<sup>th</sup> June (depending on the date of first fish delivery that year), the second between 25<sup>th</sup> June and 8<sup>th</sup> July and the third between the 12<sup>th</sup> and 24<sup>th</sup> July. Chicks are assumed to have fledged if fed on a minimum of two watches.**

|             | First fish in plot | Last fish in plot | Fed watch 1 & 2 | Min. chick age   | Fed watch 2 & 3 | Min. chick age   | Fed all 3 watches | Min. chick age   | Prod. based on 3 watches  | Ad hoc prod. |
|-------------|--------------------|-------------------|-----------------|------------------|-----------------|------------------|-------------------|------------------|---------------------------|--------------|
| <b>2017</b> | 27-May             | 30-Jul            | 33              | 20 (6/6 - 25/6)  | 6               | 18 (25/6 - 12/7) | 16                | 37 (6/6 - 12/7)  | <b>0.80</b><br>(55 of 69) | 0.57         |
| <b>2016</b> | 04-Jun             | 13-Aug            | 7               | 16 (17/6 - 2/7)  | 3               | 13 (2/7 - 14/7)  | 38                | 28 (17/6 - 14/7) | <b>0.73</b><br>(48 of 66) | 0.64         |
| <b>2015</b> | 02-Jun             | 05-Aug            | 16              | 14 (18/6 - 1/7)  | 2               | 12 (1/7 - 12/7)  | 42                | 25 (18/6 - 12/7) | <b>0.75</b><br>(60 of 80) | 0.55         |
| <b>2014</b> | 09-Jun             | 06-Aug            | 14              | 11 (28/6 - 8/7)  | 4               | 17 (8/7 - 24/7)  | 38                | 27 (28/6 - 24/7) | <b>0.74</b><br>(56 of 76) | 0.50         |
| <b>2013</b> | 09-Jun             | 14-Aug            | 11              | 15 (16/6 - 30/6) | 6               | 14 (30/6 - 13/7) | 39                | 28 (16/6 - 13/7) | <b>0.73</b><br>(56 of 77) | 0.49         |

Although the study plot was visited for a minimum of one hour every day, it certainly cannot be assumed that the first and last fish provisioning was seen for each burrow. Indeed the daylight hours

Puffin watches highlight how some burrows are provisioned infrequently (see table below). Additionally it proves difficult to standardise ad hoc recording effort between years. It was thus decided in 2016 that a three visit method would be used to calculate productivity on Skokholm, but that five visits and ad hoc records would still be collected to allow further comparisons to be made in the future (see table above and the 2016 Seabird Report for more details). This is more in line with the Seabird Monitoring Handbook (Walsh *et al.*, 1995) which states that, when monitoring Puffin productivity in colonies where the nest is inaccessible and the colony is shared with Manx Shearwaters, the most appropriate technique is ‘When birds are feeding large chicks, make a few watches to determine which burrows/crevices have fish taken down them’. Establishing which burrows contain large chicks is inevitably the main issue with this technique, necessitating earlier watches to detect chick hatching dates.

**The number of fish deliveries to known active burrows during five daylight watches.**

| No. of deliveries      | 0 | 1  | 2 | 3 | 4 | 5 | 6  | 7  | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|------------------------|---|----|---|---|---|---|----|----|---|---|----|----|----|----|----|
| No. of burrows 6 June  |   | 8  | 2 | 4 | 7 | 9 | 7  | 5  | 6 |   |    | 1  | 2  | 2  |    |
| No. of burrows 15 June | 4 | 3  | 2 |   | 6 | 6 | 6  | 10 | 8 | 5 | 1  | 2  |    |    | 2  |
| No. of burrows 25 June | 1 | 6  | 1 | 5 | 5 | 7 | 11 | 7  | 4 | 3 | 4  | 1  | 2  |    | 1  |
| No. of burrows 4 July  | 2 | 9  | 9 | 7 | 8 | 4 | 2  | 2  | 1 | 6 | 2  |    |    |    |    |
| No. of burrows 12 July |   | 10 | 5 | 2 | 3 | 2 | 1  | 1  |   |   |    |    |    |    |    |



Puffins can fledge having spent a minimum of 34 days as a burrow-bound chick, although this is more typically 38 days and can be anything up to 60 days (Ferguson-Lees *et al.*, 2011). A flaw with the three visit technique is that some chicks could potentially be counted as fledged when they had reached as little as 11 days of age (although this year they had to reach at least 18 days). However it would be incorrect to assume that only those provisioned on all three watches went on to fledge as early hatches could potentially have departed by the third watch whilst others may have hatched after the first watch. Although this three visit technique is more standardised than the ad hoc recording, the 2013 to 2017 productivity estimates of between 0.73 and 0.80 fledglings per pair

certainly include birds which did not fledge. For example a bird counted as fledged this year was known to die of an apparent eye injury at approximately 25 days old, whilst larger chicks were seen to be taken by Great Black-backed Gulls. Nevertheless this more standardised monitoring method suggests that 2017 was the most productive of the last five years (with 0.80 fledglings produced per pair). If the ad hoc records are included and it is assumed that a chick seen to be provisioned for 31 days or more was of fledging size, then the 2017 data suggests that, of the 69 monitored breeding attempts, perhaps as few as 39 (56.5%) were potentially successful (63.6% in 2016, 55.0% in 2015, 50.0% in 2014 and 49.4% in 2013), although at least 52 attempts saw a chick reach a minimum of 26 days (75.4%, see table below).

**The number of days between first and last observed chick feeding based on ad hoc recording and five daylight hours watches.**

| Days           | 1-5 | 6-10 | 11-15 | 16-20 | 21-25 | 26-30 | 31-35 | 36-40 | 41-45 | 46-55 |
|----------------|-----|------|-------|-------|-------|-------|-------|-------|-------|-------|
| No. of burrows | 6   | 1    |       | 5     | 1     | 13    | 9     | 20    | 5     | 5     |

Whilst these productivity estimates attempt to deduce the number of fledging sized birds, fledging success is almost impossible to ascertain reliably. Puffin chicks are particularly vulnerable when exercising their flight muscles at the burrow entrance prior to fledging and when making the journey to the sea. Great Black-backed Gulls were seen patrolling within the colonies during the chick provisioning period and were regularly watched taking fledging sized Pufflings.

The five daylight hours watches (made on the 6<sup>th</sup>, 15<sup>th</sup> and 25<sup>th</sup> June and the 4<sup>th</sup> and 12<sup>th</sup> July), were also used to monitor kleptoparasitism by gulls. The study plot was again confined to the area of the 100 numbered burrow stakes at Crab Bay. On 6<sup>th</sup> June 844 Puffins arrived to the study area with fish and of these 30 (3.55%) were successfully robbed. On 15<sup>th</sup> June 991 birds arrived and of these 11 (1.11%) were robbed. On 25<sup>th</sup> June 1100 birds arrived and only three (0.27%) were robbed. On 4<sup>th</sup> July 527 birds arrived and seven (1.33%) were robbed. On 12<sup>th</sup> July 177 birds arrived and five (2.82%) were robbed. It should be noted that these figures do not take into account the number of fish lost to gulls at sea or on the approach to the colony.

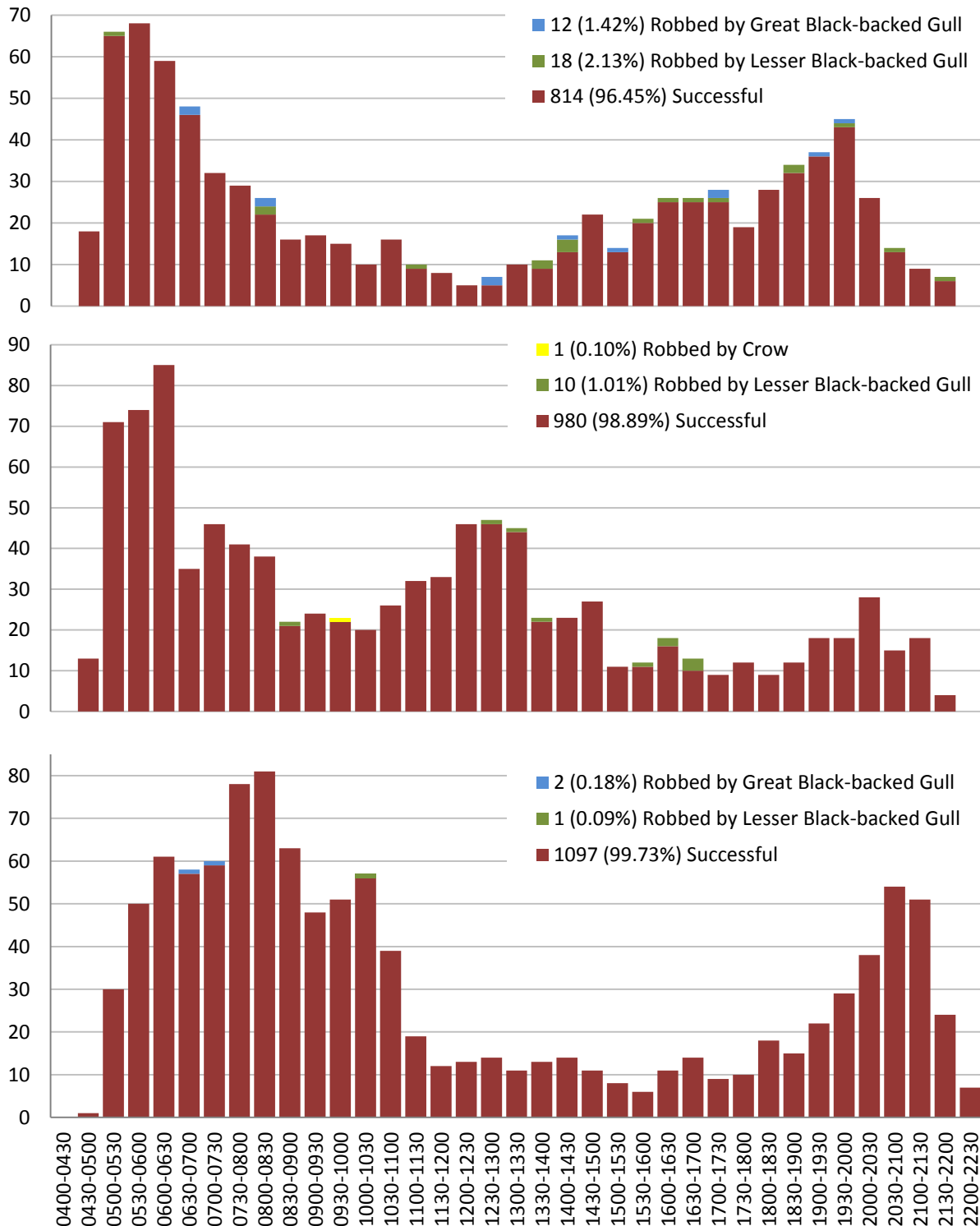
**The number of fish deliveries made to the study plot during each daylight hours watch, the number of Puffins which lost fish to the gulls over the plot and the percentage which lost fish.**

|             |                        | Watch 1 | Watch 2 | Watch 3 | Watch 4 | Watch 5 |
|-------------|------------------------|---------|---------|---------|---------|---------|
| <b>2017</b> | Number of deliveries   | 844     | 991     | 1100    | 527     | 177     |
|             | Number parasitised     | 30      | 11      | 3       | 7       | 5       |
|             | Percentage parasitised | 3.55    | 1.11    | 0.27    | 1.33    | 2.82    |
| <b>2016</b> | Number of deliveries   | 421     | 733     | 889     | 489     | 525     |
|             | Number parasitised     | 20      | 45      | 35      | 10      | 28      |
|             | Percentage parasitised | 4.75    | 6.14    | 3.94    | 2.04    | 5.33    |
| <b>2015</b> | Number of deliveries   | 699     | 927     | 916     | 521     | 123     |
|             | Number parasitised     | 43      | 34      | 23      | 10      | 4       |
|             | Percentage parasitised | 6.15    | 3.67    | 2.51    | 1.92    | 3.25    |
| <b>2014</b> | Number of deliveries   | 262     | 513     | 643     | 670     | 179     |
|             | Number parasitised     | 28      | 37      | 29      | 3       | 1       |
|             | Percentage parasitised | 10.69   | 7.21    | 4.51    | 0.45    | 0.56    |
| <b>2013</b> | Number of deliveries   | 413     | 684     | 610     | 107     |         |
|             | Number parasitised     | 76      | 40      | 32      | 11      |         |
|             | Percentage parasitised | 18.40   | 5.85    | 5.25    | 10.28   |         |

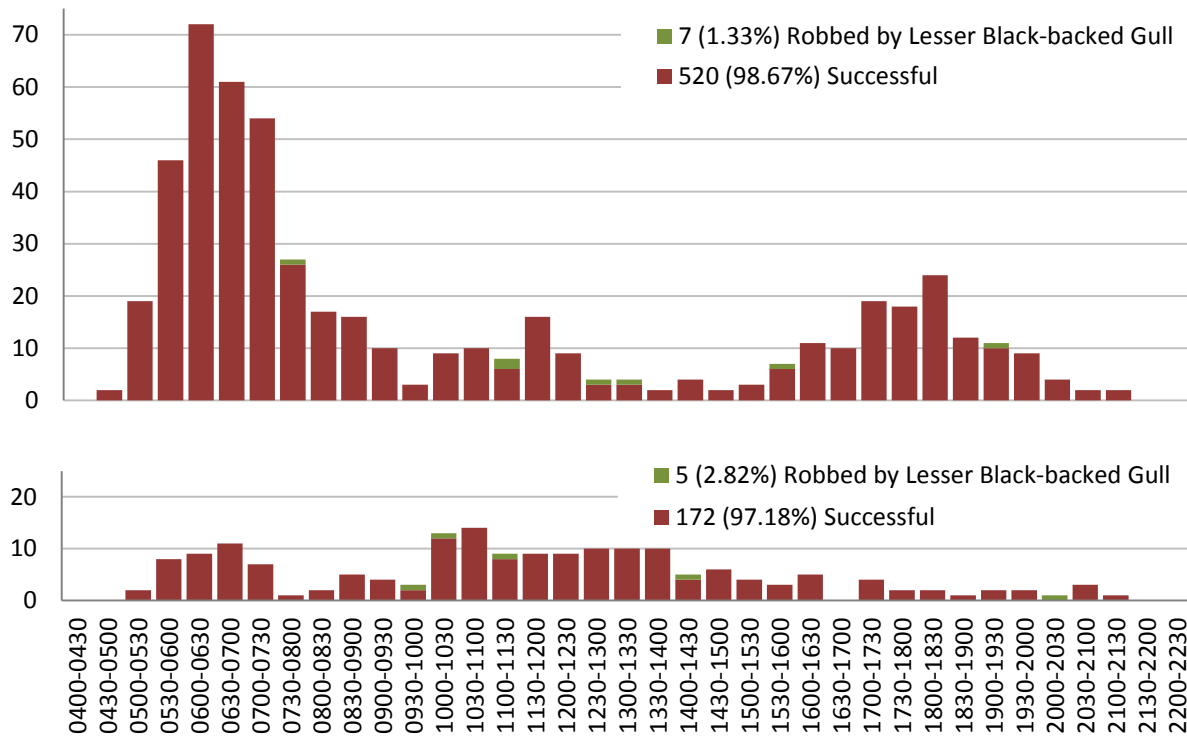
The peak in monitored kleptoparasitism in 2017 was down on each of the previous four years, both in terms of the percentage of deliveries lost over the study plot and the actual number of deliveries stolen. This is perhaps in part due to the declining Lesser Black-backed Gull population, although an

increase in Great Black-backed Gull numbers may at the same time be having an effect, with the more aggressive large gulls keeping the Lesser Black-backed Gulls from the study area. The highest levels of kleptoparasitism to be logged so far occurred in 2013. Given that the size of the study plot has remained constant over the five years of this study, it is also interesting to note how the number of recorded deliveries has shown an increase; although annual variations in Puffin productivity and the timing of the breeding season will influence the number of deliveries to the study area on each visit, these figures perhaps support the theory that the population here is increasing.

**The number of chick provisioning attempts during daylight on the 6<sup>th</sup>, 15<sup>th</sup> and 25<sup>th</sup> June 2017, along with the number of times that gulls or crows successfully robbed the fish.**



The number of chick provisioning attempts during daylight on the 4<sup>th</sup> and 12<sup>th</sup> July 2017, along with the number of times that gulls successfully robbed the fish.



**Survival in adult Puffins.** An average survival figure for each year is based on the number of birds ringed in the preceding year plus the number of previously ringed birds known to be still alive, for example 166 birds are now known to have been alive in 2013, of a 2012 total of 172 (58 ringed in 2012 plus 114 ringed previously and known to be alive). Survival after a one year establishment period means that birds have been seen within the study area before (and are therefore assumed to be located in visible positions); birds ringed in the preceding year are therefore excluded from the calculations as they may be occupying hidden areas of the colony.

| Year of ringing                | Total ringed | Seen in 2012 | Alive in 2012 | % survival 2012 | Seen in 2013 | Alive in 2013 | % survival 2013 | Seen in 2014 | Alive in 2014 | % survival 2014 | Seen in 2015 | Alive in 2015 | % survival 2015 | Seen in 2016 | Alive in 2016 | % survival 2016 | Seen in 2017 | Alive in 2017 | % survival 2017 |
|--------------------------------|--------------|--------------|---------------|-----------------|--------------|---------------|-----------------|--------------|---------------|-----------------|--------------|---------------|-----------------|--------------|---------------|-----------------|--------------|---------------|-----------------|
| 2011                           | 128          | 72           | 114           | 89.06           | 103          | 111           | 97.37           | 86           | 93            | 83.78           | 79           | 85            | 91.40           | 68           | 76            | 89.41           | 72           | 72            | 94.74           |
| 2012                           | 58           |              |               |                 | 52           | 55            | 94.83           | 36           | 40            | 72.73           | 37           | 39            | 97.50           | 34           | 37            | 94.87           | 35           | 35            | 94.59           |
| 2013                           | 51           |              |               |                 |              |               |                 | 37           | 40            | 78.43           | 35           | 37            | 92.50           | 32           | 35            | 94.59           | 31           | 31            | 88.57           |
| 2014                           | 57           |              |               |                 |              |               |                 |              |               |                 | 50           | 53            | 92.98           | 43           | 47            | 88.68           | 44           | 44            | 93.62           |
| 2016                           | 23           |              |               |                 |              |               |                 |              |               |                 |              |               |                 |              |               |                 | 19           | 19            | 82.61           |
| <b>Total</b>                   | <b>317</b>   | <b>72</b>    | <b>114</b>    | <b>89.06</b>    | <b>155</b>   | <b>166</b>    | <b>96.51</b>    | <b>159</b>   | <b>173</b>    | <b>79.72</b>    | <b>201</b>   | <b>214</b>    | <b>93.04</b>    | <b>177</b>   | <b>195</b>    | <b>91.12</b>    | <b>201</b>   | <b>201</b>    | <b>92.20</b>    |
| <b>Survival after one year</b> |              |              |               | -               |              |               | <b>97.37</b>    |              |               | <b>80.12</b>    |              |               | <b>93.06</b>    |              |               | <b>91.12</b>    |              |               | <b>93.33</b>    |

A colour ringing project was begun at Crab Bay in 2011 to allow an estimate of adult survival to be made each year. There were 128 birds ringed in the first year, 58 in 2012, 51 in 2013, 57 in 2014, 23 in 2016 and a further 24 were added to the scheme this year. The table above summarises the resighting data collected so far. What is apparent is that some birds are not seen every year, perhaps because they have not returned to the study plot or perhaps because their colour rings have not been seen (which may well be the case in years where the vegetation is longer); we now know for example that the 155 birds seen in 2013 was only 93.37% of the number actually alive. The survival estimates for more recent years are thus likely to be modified in the future, to take into account

birds which have not yet been seen. Nevertheless, with six years of resighting data now available, we can start to look at fluctuations in survival over time. Survival between the 2011 and 2012 breeding seasons was 89.06%, between 2012 and 2013 it was 96.51%, between 2013 and 2014 it was 79.72%, between 2014 and 2015 it was 93.04%, between 2015 and 2016 it was 91.12% and between 2016 and this season it was (a likely to be revised upwards) 92.20%. A flaw with this survivorship estimate is that colour marks were added to Puffins caught in flight, individuals potentially resident in areas not visible to researchers. A better estimation of survival may therefore come from looking for birds previously seen in the field (thus discounting individuals in the year after ringing); thus of 114 known to be alive in 2012, 111 (97.37%) survived to 2013, of 166 alive in 2013, 133 (80.12%) survived to 2014, of 173 alive in 2014, 161 (93.06%) survived to 2015, of 214 alive in 2015, 195 (91.12%) survived to 2016 and of 195 alive in 2016, 182 (a likely to be revised upwards 93.33%) survived to this season. The most striking feature of these survivorship estimates is the substantial drop noted after the severe 2013 to 2014 winter wrecks; it remains to be seen how often such drops in survival can occur before the spring raft counts show a decline in overall numbers.

The colour ringing project revealed an interesting case of ‘progressive greying’ this year. Although the Puffin pictured below (Black and White stripe over BTO EX83523, Yellow over Black) may appear to be partially leucistic, with predominantly white feathers in the throat, nape and mantle, we know from previous years that this bird had the appearance of a normal Puffin (the inset photograph is the same bird in 2013). This condition is caused by a progressive loss or failure of pigment cells with age.



There were noticeably more birds lining the walls to the South Haven jetty on 3<sup>rd</sup> July than seen in the previous four years, this perhaps another positive sign for the future. Unsurprisingly given the earlier 2017 breeding season, Puffins left Skokholm earlier this year than in the previous four years. There were no loafing birds in the colonies from 25<sup>th</sup> July, a day when only 460 birds were seen rafting offshore, and the following day saw a movement of over 600 birds at sea. There were 24 fish deliveries to the west side of Crab Bay in five hours of observations on 30<sup>th</sup> July (31 in one hour on the 31<sup>st</sup> last year). August saw highs of only 38 on the 2<sup>nd</sup>, 43 on the 3<sup>rd</sup> and 32 on the 6<sup>th</sup> before numbers dropped to just three on the 7<sup>th</sup>. A single fish delivery to Crab Bay on 10<sup>th</sup> August was the last to be seen this year, three days earlier than the last of 2016, six days earlier than in 2015, 13 days earlier than in 2014 (the latest breeding season in recent years) and four days earlier than in 2013. Singles off Peter’s bay on 27<sup>th</sup> August, Howard’s End on 6<sup>th</sup> September and west on 12<sup>th</sup> September were the only birds logged in what was a typical autumn.

**Ringing recovery** EY68802

**Originally ringed** as a pullus, CRAB BAY PUFFIN PLOT, SKOKHOLM 18<sup>th</sup> July 2013

**Recovered** SKOMER ISLAND, PEMBROKESHIRE 1<sup>st</sup> August 2017

**Finding condition** Dead in Great Black-backed Gull nest

**Distance travelled** 4km at 343 degrees (NNW)

**Days since ringed** 1475

**Ringing recovery** EZ16250

**Originally ringed** as an adult, CRAB BAY PUFFIN PLOT, SKOKHOLM 17<sup>th</sup> July 2015

**Recovered** FRESHWATER EAST, PEMBROKESHIRE 6<sup>th</sup> June 2017

**Finding condition** Dead on beach, died within about a week

**Distance travelled** 29km at 102 degrees (ESE)

**Days since ringed** 690

**Razorbill** *Alca torda*

**Llurs**

**Abundant Breeder**

33 trapped (including 32 pulli), 3 retrapped, 1 control

1936-1976: 9220 trapped, 2013-2016: 120 trapped, 1 retrapped, 2 controls

The average March daycount was down on the previous two years, at least in part due to poor visibility hampering morning surveys, but 117.2% up on 2014 (the year following the winter wrecks). There were lows of between 23 and zero on ten dates from the 12<sup>th</sup>, an increase in low counts compared with 2016 when there were between 24 and zero on only nine dates during the entire month. The majority of birds during the highest March counts were again on the sea; March peaks of 1340 on the 14<sup>th</sup>, 1234 on the 15<sup>th</sup>, 1779 on the 23<sup>rd</sup> and 1210 on the 25<sup>th</sup> included only 56, 339, 269 and 116 cliff occupying birds respectively. It proved the most productive April of the last five years with 19155 logged birds being the highest cumulative total and the 2100 counted on the 11<sup>th</sup> being the highest day total. Low April counts were few, with no birds present on the 4<sup>th</sup>, a single at sea on the 5<sup>th</sup> and 86 on the 25<sup>th</sup>, this compared with 2016 when there were 11 dates with fewer than 70 birds present and four zero counts. Although fewer than 600 individuals were noted on each of the last six days of the month, the first egg was found at North Gully on the 26<sup>th</sup>; this was just one day earlier than in 2016 and 2015 but 17 days earlier than the first of 2014 (probably again a consequence of the winter storms preceding that breeding season).

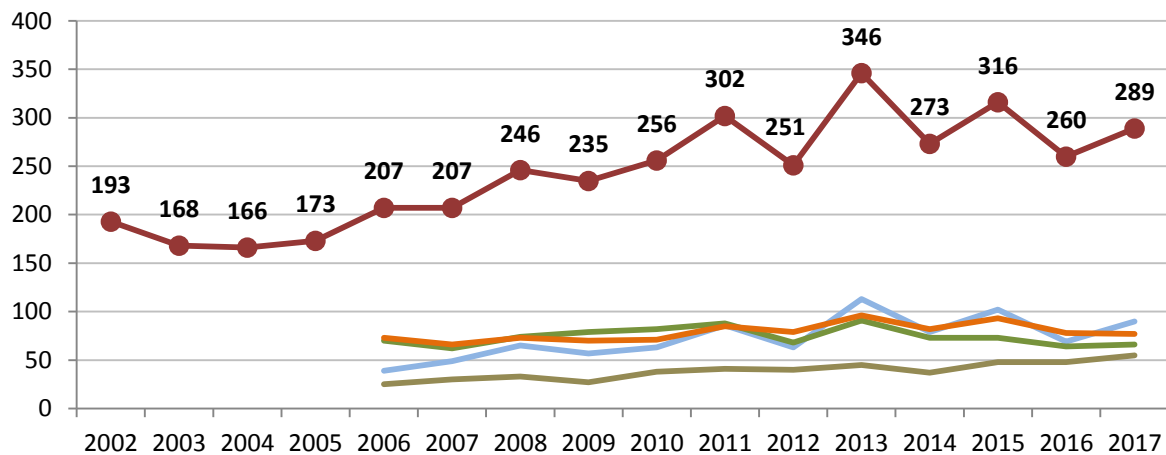


Six study plots, established in 2002, were visited on ten dates between 29<sup>th</sup> May and 12<sup>th</sup> June and every adult in suitable breeding habitat was counted. There was an 11.2% increase in numbers compared with 2016 and the mean total of 289 adults on ledges was the fourth highest on record, just 0.7% down on the 2011-2017 mean (291.0 ±sd 33.32). Almost all of the population growth



noted this year was due to a 30.4% increase in the mean number of birds occupying ledges at Little Bay Point (with an increase from 69 to 90 individuals taking the total to the third highest on record for that site). Numbers were otherwise very similar to 2016 with an average of seven extra birds at North Gully and two at Middlerock whilst the total was down one at both Twinlet and Steep Bay. The plot counts are seemingly affected by the weather in some years; in the unsettled June of 2012 the total fluctuated between 164 and 338 birds whereas the 2015 spread was the tightest on record, with a prolonged period of high pressure coinciding with the lowest standard deviation of the last five years. Conditions during this survey period again began settled, although the latter three counts were delayed due to a spell of poor weather. It is unclear why the mean number of adults within the plots has begun to oscillate so much in recent years; although the 2013-2014 winter wrecks may still be taking their toll, another possible factor is that the six Skokholm study plots are all areas shared with both Guillemots and Fulmars, species currently increasing rapidly both in the plots and on Skokholm as a whole and which may be competing with Razorbills for space in the plots.

**The total number of adult birds in all six study plots 2002-2017 (as an average from ten visits) and the totals from the four largest plots (as an average from ten visits).**



Whole Island counts were made between 28<sup>th</sup> May and 2<sup>nd</sup> June, including a boat-based count on the 28<sup>th</sup>. This was the fifth year running that access to a boat had been available, inevitably leading to higher but more accurate whole Island counts; in 2012 rough seas meant that there was no opportunity for a boat-based count and it was concluded that ‘there remains a section of North Coast that was missed, while other parts of the North Coast and Bluffs were counted less accurately at a distance’ (Gillham and Yates, 2012). A whole Island total of 2491 adults in suitable breeding habitat this season was 11.1% up on the 2242 logged in 2016 and the highest total yet recorded on Skokholm (42.8% up on the 2008-2017 mean of 1744.6 ±sd 613.55).

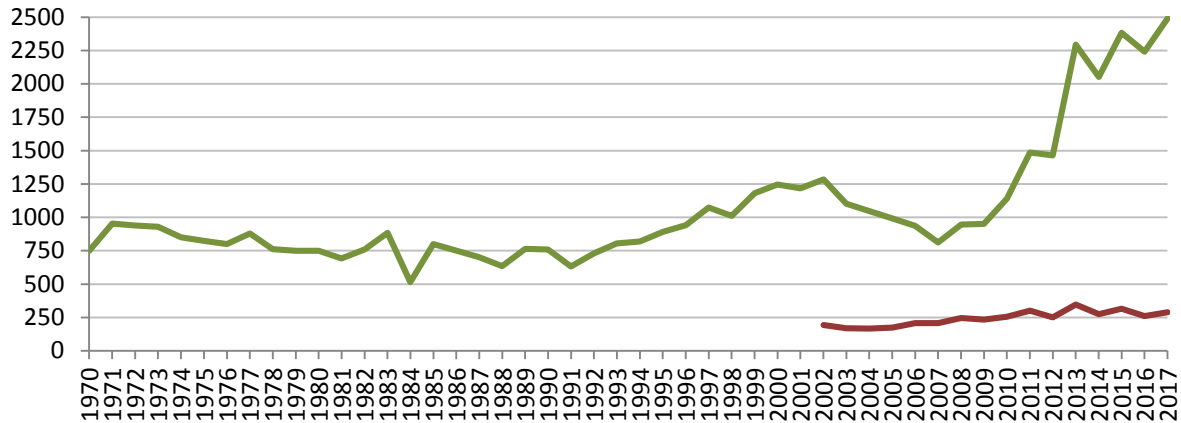
**The whole Island totals, mean plot totals and the percentage of the Island totals made up of study plot birds 2007-2017. Also the range of plot counts since 2012 and the standard deviation observed over the ten plot visits since 2013. (\*includes a boat-based count)**

|               | 2007 | 2008 | 2009 | 2010 | 2011  | 2012    | 2013    | 2014    | 2015    | 2016    | 2017    |
|---------------|------|------|------|------|-------|---------|---------|---------|---------|---------|---------|
| <b>Island</b> | 812  | 946  | 950  | 1140 | 1486* | 1463    | 2294*   | 2052*   | 2382*   | 2242*   | 2491*   |
| <b>Plots</b>  | 207  | 246  | 235  | 256  | 302   | 251     | 346     | 274     | 316     | 260     | 289     |
| <b>Range</b>  |      |      |      |      |       | 164-338 | 301-397 | 254-315 | 291-346 | 236-324 | 253-334 |
| <b>±SD</b>    |      |      |      |      |       |         | 30.54   | 19.96   | 15.78   | 26.58   | 25.61   |
| <b>Plot %</b> | 25.5 | 26.0 | 24.8 | 22.5 | 20.3  | 17.2    | 15.1    | 13.4    | 13.3    | 11.6    | 11.6    |

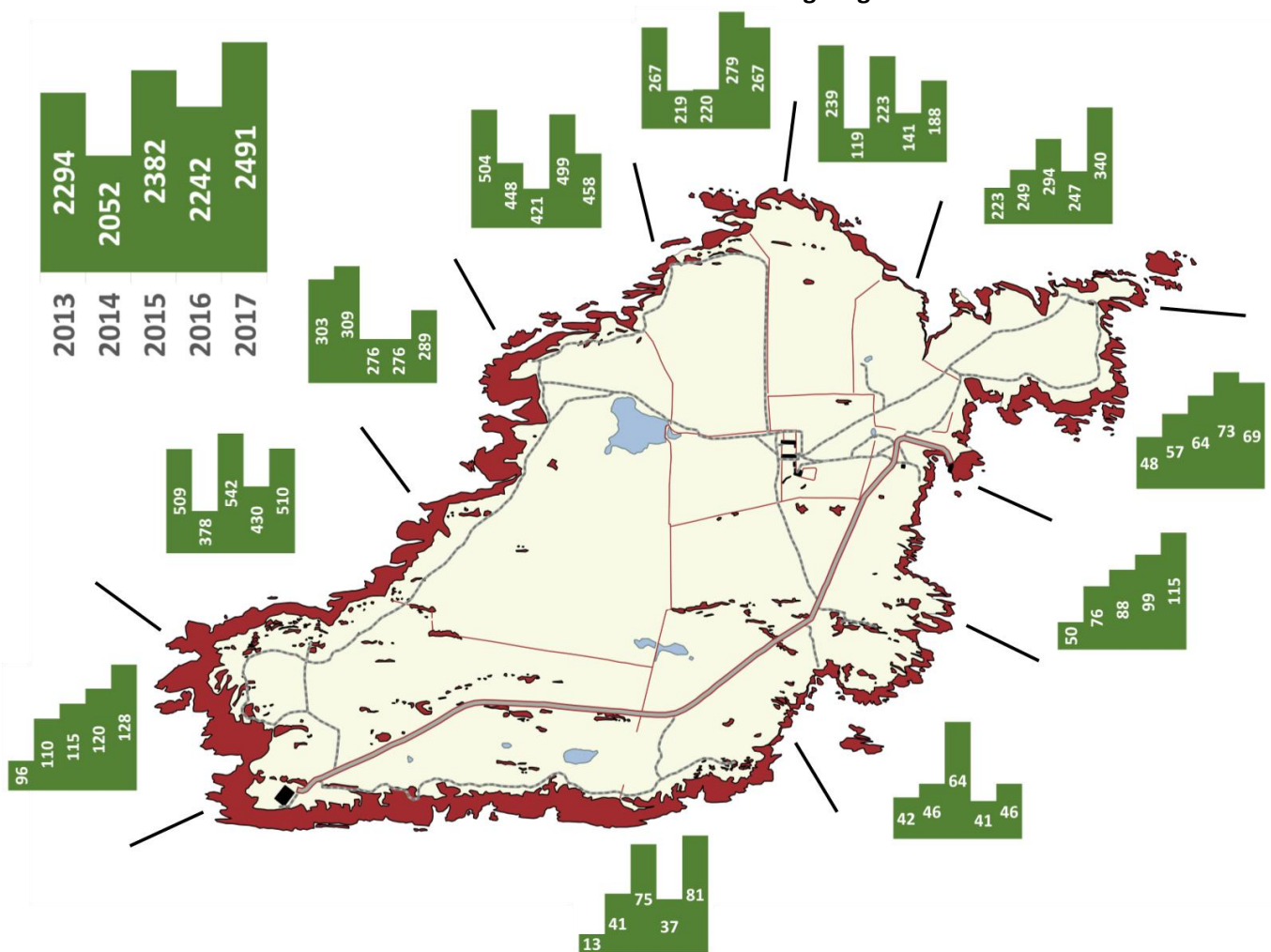
The increase in the whole Island total almost exactly mirrored the increase observed in the study plots. As can be seen from the map below, the largest increases came along the north side of the Neck (93 more adults on ledges), at the Bluffs (80 more), along Near and Far Bays (47 more) and

along the South Coast (44 more). Nevertheless the period of rapid population growth witnessed on Skokholm in recent years has seemingly slowed, almost certainly linked in part to the winter wrecks of 2013-2014 which in Pembrokeshire impacted this species more than any other.

**The total number of Razorbills (adults on ledges) recorded on Skokholm since 1970 and the number of birds within the study plots since 2002.**



**The distribution of Razorbills on suitable breeding ledges 2013-2017.**



Productivity monitoring was undertaken for a fifth year running and the same two study sites were used, one a cliff below the Neck Razorbill Hide where 28 incubating pairs were located by 22<sup>nd</sup> May and one a site among the Bluffs boulder slope where 40 egg sites were marked on 20<sup>th</sup> May. There

are currently concerns among ICAC members that recent Pembrokeshire productivity estimates have been quite low (on Skokholm ranging between 0.21 in 2015 and 0.66 in 2013), perhaps lower than what actually occurred given the continued growth of the population and certainly too low to maintain the expansion. One explanation for low productivity estimates could be that the plots, particularly the exposed Neck plot where predation is seemingly very high, are not representative of the Island as a whole. With this in mind an additional cliff plot was established this year, with 24 sites monitored at North Gully from 19<sup>th</sup> May.

At the Neck there were six failures at egg stage, seven failures at either egg or small chick stage and 11 attempts failed during chick rearing; although the reason for failure was typically unclear, elsewhere on the Island eggs and young were seen to be taken by Ravens, Great Black-backed Gulls and most commonly by Herring Gulls. Thus only four chicks reached jumping age at the Neck; the resulting productivity figure of 0.14 mirrors recent lows at this site (there were 0.03 jumplings per pair in 2016, 0.17 in 2015 and 0.36 in 2014). The new cliff site at North Gully proved more productive with just two egg stage failures, four failures with eggs or small chicks and four failures at chick stage; the resulting productivity value of 0.58 jumplings per pair was the highest cliff site productivity logged since 2013 (when productivity at the Neck plot was found to be 0.77).

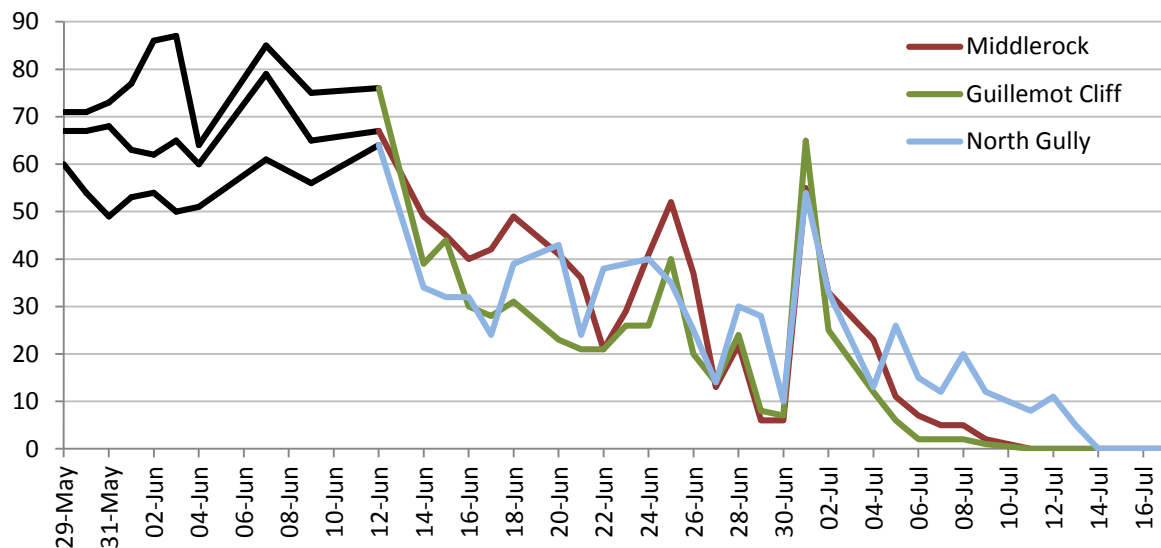


Among the Bluffs boulders three pairs failed at egg stage, with the eggs found abandoned rather than disappearing. A further 12 pairs failed with either eggs or small chicks and six pairs failed with chicks (two of which were found dead and abandoned rather than being predated). There were 19 pairs which produced a jumping sized chick; the resulting productivity value of 0.48 jumplings per pair is down on the 0.74 logged in 2016 and the 0.55 of 2013 but up on the 0.29 of 2015 and the 0.44 of 2014. For a fifth year running the last of the breeding attempts within the boulders were concluded before the last of the attempts on the cliffs; this perhaps reflects a tendency for large chicks among the boulders to move away from the egg site, whilst cliff chicks have little room for movement.

Combining the productivity figures for the cliff plots and the boulder plot to give an indication of overall productivity on Skokholm can be achieved in two ways, either by averaging the final values obtained for the three sites, as recommended in the Seabird Monitoring Handbook (Walsh *et al.*, 1995), or by combining all the data from the three plots (that is to say by dividing the total number of jumplings at all sites by the total number of monitored sites). This year both techniques result in the same overall productivity value of 0.40 jumping-sized chicks per active site, a value pulled down by low productivity on the Neck. The 2017 estimate is virtually identical to the 0.39 logged last year, matches observed productivity in 2014 and is up on the 0.21 of 2015, all values well down on the

0.66 of 2013 (the figures given here for previous years were calculated by averaging the overall productivity values of each site, as suggested in Walsh).

**The number of adults on ledges within three of the plots (standard study period in black).**



For a fourth year running counts at three of the study plots were continued beyond the normal study period to ascertain the pattern of colony attendance during the remainder of the breeding season (see chart above). There were again fluctuating numbers in all three colonies and regular peaks when the totals were presumably augmented by the return of failed adults or the presence of more non-breeding birds; interestingly these peaks were again broadly consistent between colonies suggesting that the returning birds respond to the same environmental cues. The first jumping had departed the productivity plots by 20<sup>th</sup> June, two days earlier than last year and six days earlier than in 2015, and all but one productivity chick had departed by 3<sup>rd</sup> July; the jumping period was thus very similar to that observed in the previous two years but considerably earlier than in the late 2014 season when only 60% of young had jumped by 7<sup>th</sup> July. There was a similar departure of adults and the number logged dropped rapidly from 1<sup>st</sup> July. There were only double figure counts from 11<sup>th</sup> July (14<sup>th</sup> July in 2016, 8<sup>th</sup> July in 2015 and 17<sup>th</sup> July in 2014) and these had dropped to single figure counts by the 22<sup>nd</sup> (25<sup>th</sup> July in 2016, 22<sup>nd</sup> July in 2015 and 27<sup>th</sup> July in 2014). Adults were last seen on the cliffs on 24<sup>th</sup> July, the same date as in the previous two years, seven days earlier than in 2014 and three days earlier than in 2013.

There were daily records at sea until 31<sup>st</sup> July, the first blank day since the spring. In August there were 48 birds, predominantly adults escorting young, logged over 12 dates and a high of 18 on the 19<sup>th</sup>. There were almost daily sightings in September, with a spike in numbers between the 10<sup>th</sup> and 19<sup>th</sup> when gale or storm force winds from the westerly quarter, coupled with rough or very rough seas, coincided with daily counts of between 41 and a remarkable 1148 on the 16<sup>th</sup>; all of the birds on the 16<sup>th</sup> were flying northwest and passage peaked at 277 in 30 minutes. The historical log data suggests that this was the largest September movement to be noted from Skokholm, although the number of unidentified large auks passing has approached these levels in the past. There were 237 birds noted over 17 dates in October and in November 167 over seven dates until the departure of staff on the 9<sup>th</sup>; no birds were seen to return to the breeding ledges. Further large auks were present at sea during the autumn but they remained unidentified due to their distance from the Island; there were 495 in September, 131 in October and 337 in early November.

#### Ringling recovery K30934

**Originally ringed** as a chick, THE BLUFFS, SKOKHOLM 14<sup>th</sup> June 2017

**Recovered** BURELA, LUGO, SPAIN 27<sup>th</sup> February 2018  
**Finding condition** Dead on beach, died within about a week  
**Distance travelled** 908km at 190 degrees (S)  
**Days since ringed** 258

**Ringing recovery** M83929  
**Originally ringed** as a chick, BARDSEY ISLAND, GWYNEDD 22<sup>nd</sup> June 1998  
**Recovered** THE BLUFFS, SKOKHOLM 20<sup>th</sup> May 2017  
**Finding condition** Metal ring read in field  
**Distance travelled** 122km at 196 degrees (SSW)  
**Days since ringed** 6907

**Guillemot *Uria aalge***

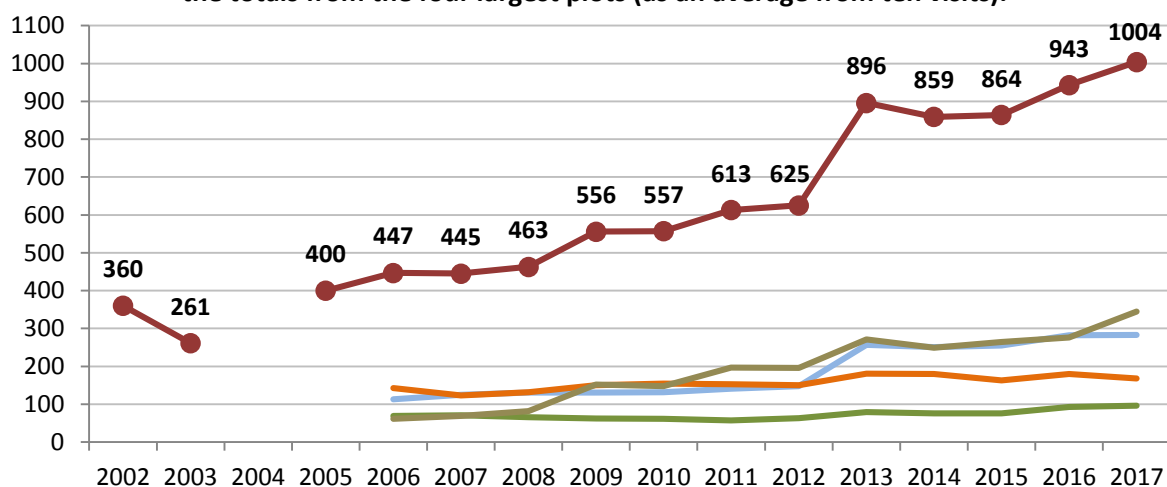
**Gwylog**

**Abundant Breeder**

2 controls  
 1936-1976: 1023 trapped, 2013-2016: 3 pulli trapped, 14 controls

Telescope views of the Island from Dale Airfield on 8<sup>th</sup> March had revealed what appeared to be a full complement of Guillemots occupying ledges, however there were no birds present when staff returned to Skokholm on the 12<sup>th</sup>, no birds on the 13<sup>th</sup> and only 34 at sea on the 14<sup>th</sup>. Although March counts then increased, peaking at 2922 on the 28<sup>th</sup>, there were a further seven dates during the month when birds were absent and six dates with fewer than 155 individuals logged. The customary departures for the sea continued in April, with no birds logged at all on the 5<sup>th</sup> and with 12 further counts of 362 or less before the end of the month, including 96 on the 26<sup>th</sup> which was the last significant pre-breeding departure (13 mass departures matches that observed in April 2016 and 2015, this compared with 19 in 2014 and 2013). The first egg of 2017 was found at North Gully on 29<sup>th</sup> April; this was the first confirmed April egg for Skokholm, although there was a possible one on 26<sup>th</sup> April 2003. The first egg of 2016 was noted on 5<sup>th</sup> May, three days later than the first of 2015 but ten days earlier than in 2014 (following the winter auk wrecks) and eight days earlier than in 2013. Whereas colony attendance continued to fluctuate during the first half of May in 2013 and 2014, the last three seasons have seen consistently high totals from early in the month. A bird at North Gully on 29<sup>th</sup> April exhibited patchy pink and red staining to all areas of white plumage, the cause of which could not be ascertained; it was not seen again.

**The total number of adult birds in all six study plots 2002-2017 (as an average from ten visits) and the totals from the four largest plots (as an average from ten visits).**



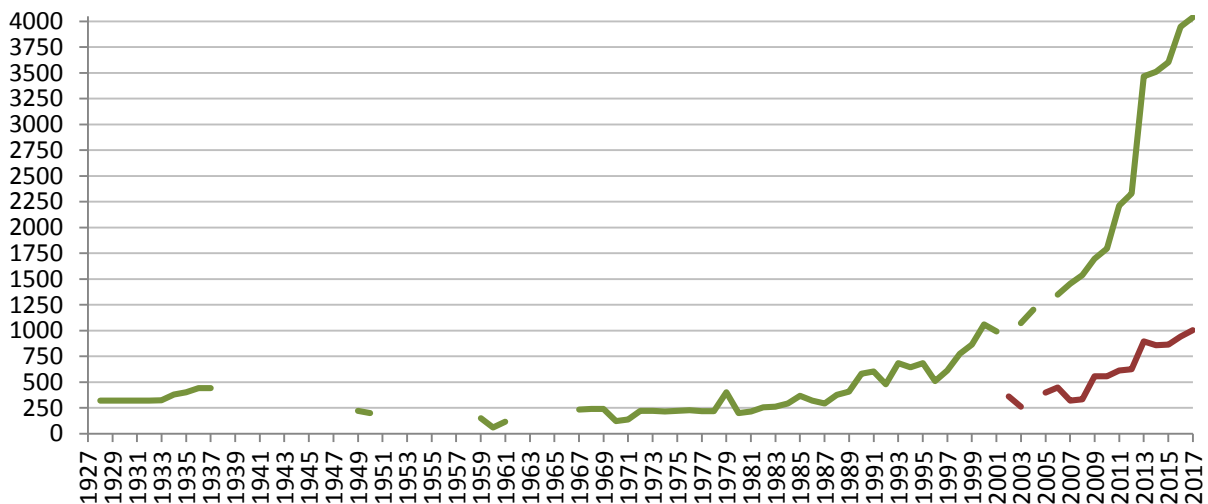
The six study plots were counted on ten dates between 29<sup>th</sup> May and 12<sup>th</sup> June. The mean total from all plots was 1004 adults on ledges; this was 6.5% up on the record total set last year and 36.0% up

on the 2008-2017 mean (738.0 ±sd 193.84). The majority of this increase was due to a 25.0% rise in the number of birds at North Gully, an area which has seen remarkable growth from a ten visit mean of 61 birds in 2006 to 345 this year. Smaller increases of between 3.2% and 12.8% were logged at Steep Bay and the slope to Purple Cove and the Little Bay Point count proved to be almost identical to last year, with an average of one extra bird taking the total to 283 (150.4% more than were present in 2006). However there were not increases across the board, as the average number of birds at Middlerock dropped from 64 to 59 and the total at Twinlet dropped from 180 to 168; interestingly the number of Razorbills at these two sites has also plateaued whilst Fulmar activity has increased to the point where eggs were lost during aggressive encounters. The majority of the 2017 study period was again dominated by high pressure, although the latter three counts were delayed due to inclement weather; this disruption may have been responsible for the larger than average difference between the highest and lowest counts, with the 2017 spread being the widest since 2012 when poor weather hampered the survey period. Given that there had only ever been one four-figure plot count in the history of this project, that there were four this year was notable.

**The whole Island totals, mean plot totals and the percentage of the Island totals made up of study plot birds 2007-2017. Also the range of plot counts since 2012 and the standard deviation observed over the ten plot visits since 2013. (\*includes a boat-based count)**

|               | 2007 | 2008 | 2009 | 2010 | 2011  | 2012    | 2013    | 2014    | 2015    | 2016     | 2017     |
|---------------|------|------|------|------|-------|---------|---------|---------|---------|----------|----------|
| <b>Island</b> | 1455 | 1538 | 1697 | 1795 | 2212* | 2330    | 3466*   | 3512*   | 3603*   | 3949*    | 4038*    |
| <b>Plots</b>  | 445  | 463  | 556  | 557  | 613   | 625     | 896     | 859     | 864     | 943      | 1004     |
| <b>Range</b>  |      |      |      |      |       | 530-746 | 824-949 | 797-947 | 756-939 | 887-1003 | 939-1144 |
| <b>±SD</b>    |      |      |      |      |       |         | 39.20   | 54.25   | 58.30   | 40.25    | 57.45    |
| <b>Plot %</b> | 30.6 | 30.1 | 32.8 | 31.0 | 27.7  | 26.8    | 25.9    | 24.5    | 24.0    | 23.9     | 24.9     |

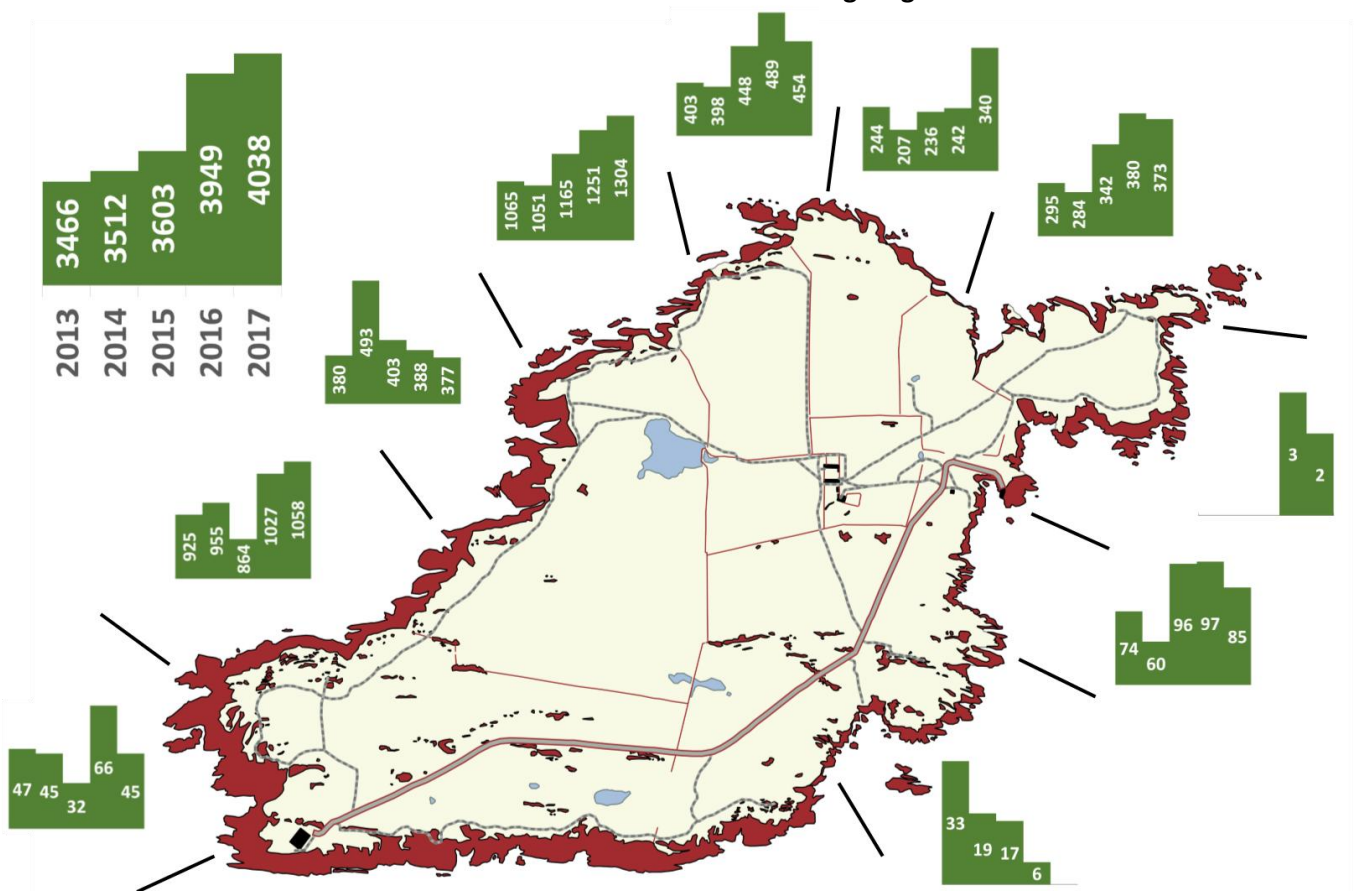
**The total number of Guillemots (adults on ledges) recorded on Skokholm since 1928 and the number of birds within the study plots since 2002.**



Whole Island counts were made from the land between 28<sup>th</sup> May and 2<sup>nd</sup> June and calm seas allowed for a boat-based count on 28<sup>th</sup> May. Boat-based surveys allow some areas to be monitored which cannot be viewed from on the Island and enable closer access to some areas which can normally only be viewed at a distance. A total of 4038 adults in suitable breeding habitat was a 2.3% increase on the 2016 count and the highest total yet recorded on Skokholm. This is the smallest increase in the population noted since 2014 and the second smallest increase of the last ten years, well down on the 2007-2017 average of 17.75% growth per year. The proportion of the whole Island count made up of study plot birds (24.9%) was very close to the 2013-2017 average of 24.6%, as might be expected if the change in the whole Island population is mirroring that observed in the more intensively studied plots (assuming that there is equal room for expansion in both the plots

and across the Island as a whole); it thus seems likely that there was a genuine drop in the rate of population growth this year. That the increase in the whole Island count was smaller than that observed in the plots perhaps reflects the fact that the Island count is based on fewer visits and only one boat-based count (and is thus more likely to be further from the actual mean). As can be seen from the below map, the largest increases were observed along Near and Far Bays (98 more birds) and either side of North Gully (53 more birds), whilst there were drops in seven areas, most notably around Little Bay Point (35 fewer birds) and the Quarry (21 fewer birds). These counts of individuals on ledges potentially include incubating adults, some of their partners, failed breeders, non-breeding adults and younger birds yet to breed; a correction factor is thus sometimes adopted to convert the count to an estimate of breeding pairs (Harris *et al.*, 2015). A 2015 survey on Skokholm found the correction factor to be 0.64, a figure similar to the 0.67 widely adopted in previous studies (see the Skokholm Seabird Report 2015); the latter correction factor predicts the Skokholm breeding population to be in the region of 2705 pairs.

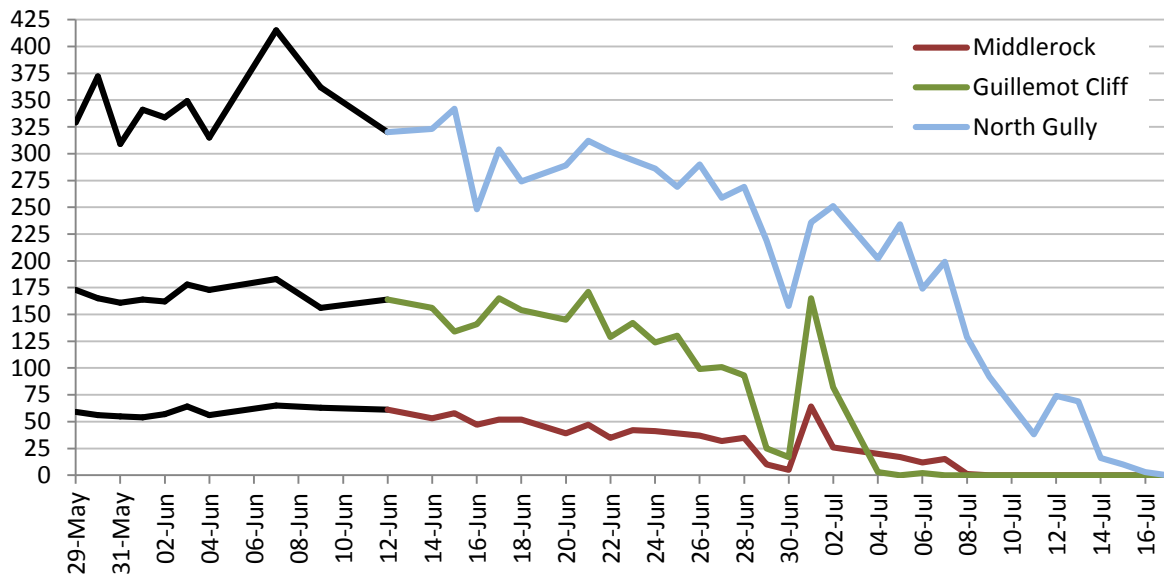
**The distribution of Guillemots on suitable breeding ledges 2013-2017.**



The first chick to be seen this season was found at Middlerock on 2<sup>nd</sup> June, four days earlier than the first of 2016, five days before the first of 2015 and 11 days before the first of 2014 (the year following the severe winter wrecks). Productivity, calculated at between 0.55 and 0.61 chicks per pair in 2013 and 0.6 in 2007, was not assessed in 2017 in accordance with recommendations from the Islands Conservation Advisory Committee. Chicks were jumping from 17<sup>th</sup> June and the number of adults recorded in the plots dropped steadily from 530 on the 21<sup>st</sup> to 180 on the 30<sup>th</sup>. A late spike to 465 plot birds on 1<sup>st</sup> July was an increase observed across the Island as a whole and which was also seen in the number of Razorbills present (see above). Plot counts then fell sharply to 225 on the 4<sup>th</sup>, 92 on the 9<sup>th</sup> and 16 on the 14<sup>th</sup>. The last birds had left Guillemot Cliff by the 5<sup>th</sup>, Middlerock by the 9<sup>th</sup> and North Gully by the 17<sup>th</sup>; this was the fourth year running in which birds were later to depart from North Gully, although this may in part reflect the larger breeding population at this site.

The three birds occupying North Gully ledges on 16<sup>th</sup> July were one day earlier than the last of 2016, two days earlier than the last of 2015 and six days earlier than the last of 2014. Whole Island counts mirrored those made at the plots, with two brooding birds near North Gully on 18<sup>th</sup> July the last to be seen ashore (23<sup>rd</sup> July in 2016 and the 25<sup>th</sup> in 2015). There were daily sightings at sea until the end of the month, totalling 128 birds, and in August there were records on 22 dates, totalling only 178 individuals and with peaks of 70 on the 19<sup>th</sup> and 11 on the 5<sup>th</sup> and 28<sup>th</sup>; although Skokholm counts were low, a boat trip four miles offshore during August revealed hundreds of rafting birds. Two red rings with white lettering (1211 and 1258) were found in the same Great Black-backed Gull nest during the fledging period; both belonged to Skomer Guillemot chicks ringed only a few days before.

**The number of adults on ledges within three of the plots (standard study period in black).**



September counts were typically low, with 100 birds logged over 22 dates and peaks of 27 on the 11<sup>th</sup> and 13 on the 12<sup>th</sup>, although a further 495 unidentified large auks were noted at sea during the month (268 Guillemots and 679 unidentified auks were logged in September 2016). The 30 birds noted over six dates in October echoed the 45 of 2016 and the 25 of 2015, however the 131 distant, unidentified auks logged during the same period was well down on the 2055 of last year. Early November proved similarly quiet, with 30 birds over five dates to the 9<sup>th</sup> and a further 337 distant auks. Although a return of Guillemots to the breeding ledges in early winter is to be expected, there was no record of this behaviour on Skokholm between 2000 and 2014, despite the fact that staff did not depart until 24<sup>th</sup> November in 2014 and 16<sup>th</sup> November in 2013. However November 2015 saw up to 540 birds return to the cliffs over five dates and last season there were up to 216, again on five dates. Such a return to the colony outside of the breeding season, with the risk of being predated, must have a substantial benefit; it has been suggested that the return may be to secure the best breeding ledges and thus secure the best mate (Harris *et al.*, 2006), but birds ashore may also use less energy than those at sea (Humphreys *et al.*, 2007). Despite the potential benefits, there were no auks seen ashore before the departure of staff this year.

**Lesser Black-backed Gull *Larus fuscus***

**Gwylan Gefnddu Leiaf**

**Abundant Breeder** previously very abundant breeder

45 trapped (including 39 pulli), 4 retrapped, 1 control

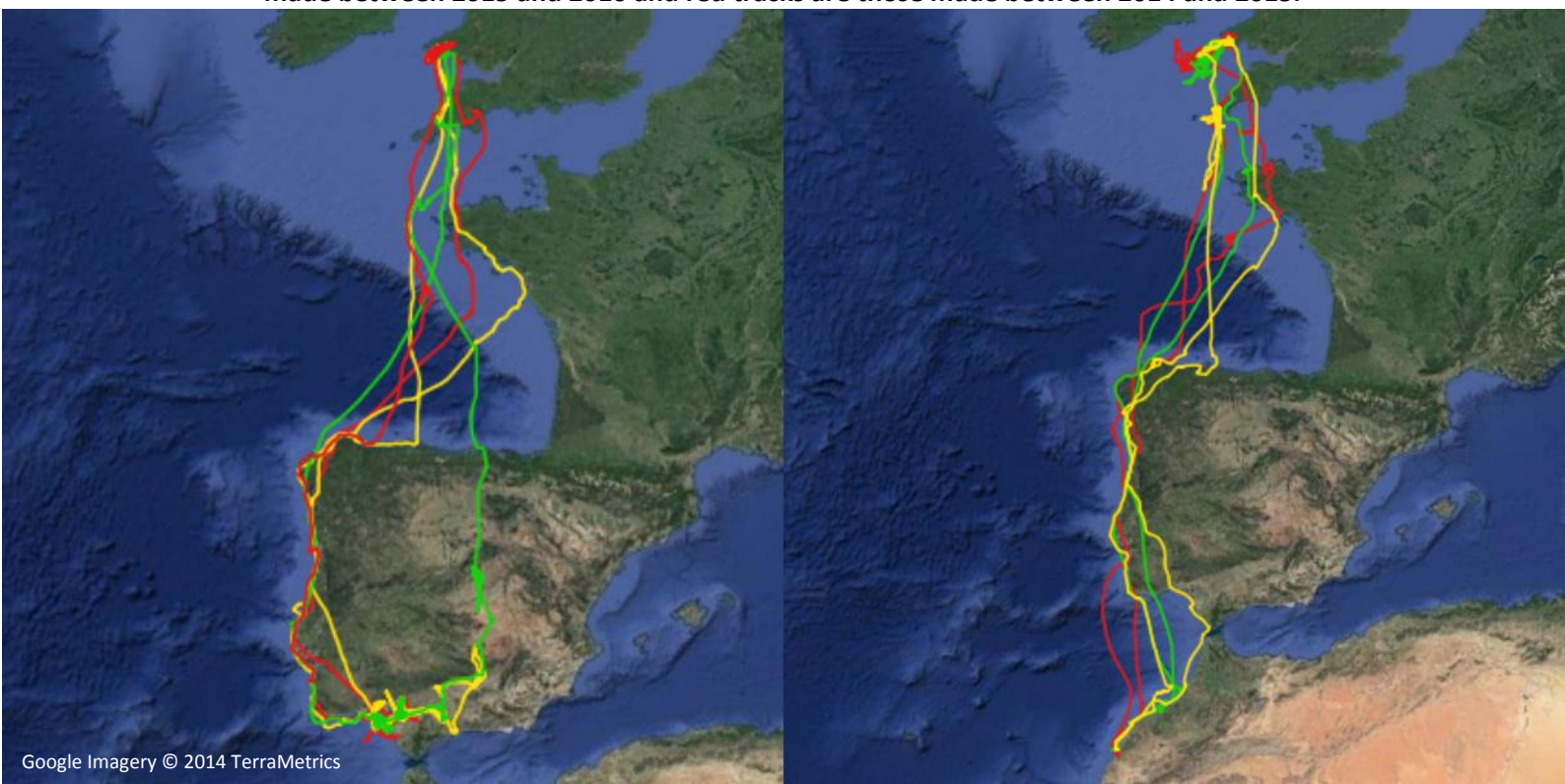
1936-1976: 12,085 trapped, 2013-2016: 370 trapped, 11 retrapped, 12 controls

Even taking into account the later arrival of staff in 2017, the March total of 10365 logged birds was poor; this was reflected in the average number of birds logged per March day which was the lowest of the last five years, 330 down on 2016 and 242 down on 2015, and the peak daycount of 802 which



was between 477 and 1289 down on the peak March counts of the previous four years. The number of birds within the colonies again fluctuated considerably during the day, however the larger communal roosts recorded in previous years were generally absent, with the majority of March counts being of birds on territory; the largest roosts away from the breeding colonies were a minimum of 110 at North Pond on the 23<sup>rd</sup> and 108 on the 26<sup>th</sup>. In 2015 and 2016 the GPS trackers fitted by the British Trust for Ornithology in 2014 (funded by the Department of Energy and Climate Change) gave some idea as to when birds first returned for the breeding season (see the relevant Skokholm Seabird Reports for details of return dates and the range of over-wintering strategies used). This year there were only two tagged birds with functioning trackers, individuals which could not be retrapped in 2016. These again revealed some impressive winter movements and one last surprise; whereas the 2016 data had suggested that birds make relatively similar journeys each winter (as was seen with the individual shown below which overwinters in Morocco), this year it was revealed that a bird overwintering in the Huelva region had returned by a totally different route (via central Spain in an extension of a journey it made towards Ciudad Real in the winter of 2015-2016). This summer saw the removal of the BTO base station from Skokholm and the end of what has been a fascinating project.

**Comparing the winter range of two Lesser Black-backed Gulls over successive winters. Green tracks are those made between the 2016 and 2017 breeding seasons, yellow tracks are those made between 2015 and 2016 and red tracks are those made between 2014 and 2015.**



Numbers logged in April were again relatively consistent, although there were occasional mass movements such as on the 4<sup>th</sup>, when the number of birds in the Frank's Point subcolony increased from 17 to 130 as the day progressed, or on the 17<sup>th</sup> when the number there increased from 44 to 184. There were also occasional roosts away from the main subcolonies during the month, peaking at 260 to the south of North Pond on the evening of the 25<sup>th</sup>. All of the apparently incubating birds checked on 27<sup>th</sup> April were found to be sitting on empty nests and it was not until 1<sup>st</sup> May that a single egg was located; this was six days later than a single in 2016, three days earlier than the first of 2015 (when two nests at North Pond contained three eggs and three contained a single egg) and seven days later than the first of 2014 (when it was again a single egg found).

Vantage point counts of all the inland breeding colonies and a full census of the coast nesting pairs were made between the 18<sup>th</sup> and 23<sup>rd</sup> May, during which 903 apparently incubating adults (aia) were located (the lowest total in over 50 years and well down on the 1209 of 2016, the 1275 of 2015, the 1407 of 2014 and the 1476 of 2013). Walk through counts were undertaken at six subcolonies on the 24<sup>th</sup> to check the accuracy of the point counts. A comparison of the number of apparently incubating adults and the number of nests containing eggs suggested that there was a discrepancy (see table below). The number of incubating birds in the plot to the south of Spy Rock was overestimated by the vantage point count, presumably due to resting guard birds or non-breeders appearing as if they were incubating or due to birds sitting on empty nests. The remaining five plots contained more nests with eggs than the number of apparently incubating adults, presumably due to incubating birds being hidden in vegetation; this was most apparent to the south of the Top Tank ridge where there were 53.97% more nests containing eggs than aia, to the south of North Pond where there were 36.17% more nests with eggs than aia and to the north of the Top Tank ridge where there were 30.88% more nests with eggs than aia. On average across the six plots there were 27.32% more nests containing eggs than were predicted during the vantage point counts (466 with eggs compared with 366 aia during the counts); in 2016 there were 18.18% more nests with eggs than picked up during the vantage point counts, in 2015 there were 25.00% more and in 2014, when the vegetation was particularly low, there were 12.89% more. A correction factor of 1.27 (466/366) was thus applied to inland vantage point plots containing similar dense vegetation to that encountered in the walk through plots, but not to the cliff counts and areas of very short sward.

The corrected total for the inland plots was 558 pairs. This, combined with the 466 nests with eggs encountered on the walkthroughs and the 99 birds incubating in open areas, gave a 2017 whole Island total of 1123 pairs. This was 19.6% down on the 1397 pairs recorded in 2016, down on the 1486, 1565 and 1476 pairs logged in 2015, 2014 and 2013 respectively and the largest drop in numbers since the 32.9% decline observed between 2012 and 2013.

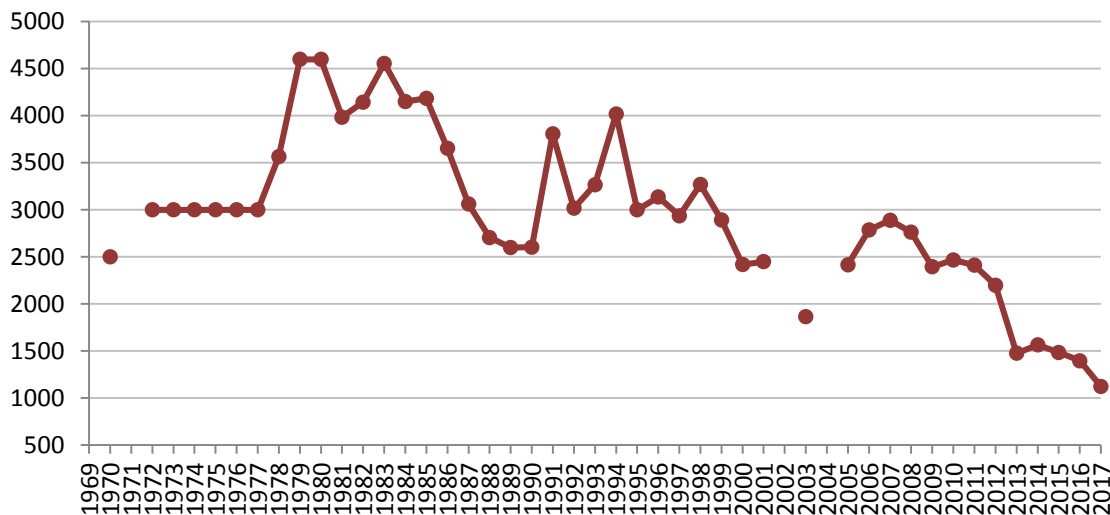
**A comparison of vantage point counts (of apparently incubating adults) and walk through nest counts, along with a summary of nest contents. \*how many more/less active nests (containing eggs) were present than the number of incubating birds seen (%).**

|               | Vantage point count | Walk through count | Empty/With egg(s) | Percentage of empty nests | Difference between counts* | Egg count   | Eggs per nest with eggs |
|---------------|---------------------|--------------------|-------------------|---------------------------|----------------------------|-------------|-------------------------|
| Spy Rock S    | 52 aia              | 61 nests           | 12/49             | 19.67%                    | -5.77%                     | 135         | 2.76                    |
| Top Tank N    | 68 aia              | 90 nests           | 1/89              | 1.11%                     | +30.88%                    | 250         | 2.81                    |
| Top Tank S    | 63 aia              | 106 nests          | 9/97              | 8.49%                     | +53.97%                    | 257         | 2.65                    |
| North Pond    | 47 aia              | 86 nests           | 22/64             | 25.58%                    | +36.17%                    | 165         | 2.58                    |
| Orchid Bog    | 39 aia              | 54 nests           | 5/49              | 9.26%                     | +25.64%                    | 126         | 2.57                    |
| Frank's Point | 97 aia              | 120 nests          | 2/118             | 1.67%                     | +21.65%                    | 322         | 2.73                    |
| <b>Total</b>  | <b>366 aia</b>      | <b>517 nests</b>   | <b>51/466</b>     | <b>9.86%</b>              | <b>+27.32%</b>             | <b>1255</b> | <b>2.69</b>             |

As the walk through plots mirrored those used in 2016, a direct comparison can be made. The most striking decline occurred to the north of the Wheelhouse (to the south of Medicine Rock Wall) where, for the first time, no birds nested at all. Within the occupied walk through plots it was the area to the south of Spy Rock which saw the largest fall in numbers, dropping by 26.9%. The subcolony to the west of Orchid Bog showed a similar decline, with a drop of 24.6% (which follows a fall of 12.2% between 2015 and 2016). There was a 19.0% drop in numbers to the south of North Pond (following an 8.1% fall last year), a 13.2% drop at Frank's Point (following a 2.3% increase last year) and an 11.0% drop to the north of the Top Tank ridge (which increased by 14.9% last year). The only plot where an increase was noted was to the south of Top Tank ridge where there were 2.1% more nests with eggs this year. Although it should perhaps be no surprise that the Skokholm

breeding population is declining given the poor productivity witnessed for many years, it was suggested last year that disease may also be taking its toll; there were 21 dead adults found between 4<sup>th</sup> March and 1<sup>st</sup> August 2016 which were thought to be diseased, with the period before death characterised by very lethargic behaviour and a fine shaking of the head before a loss of limb coordination. This year only one adult was seen with similar symptoms (on 3<sup>rd</sup> August) and another two adults were found dead at North Pond. A bird behaving very strangely on 15<sup>th</sup> June, spinning in circles and aggressively biting its own right carpal, was perhaps diseased or poisoned.

**The total number of Lesser Black-backed Gull breeding pairs 1970-2017. Control measures started in 1984 (destruction of nests) and stopped in 1998.**



Over the period 1991-2002 the count of empty nests varied from 11-44% of the total number of nests, with a mean of 22.7% (Thompson, 2007). Four subcolonies contained fewer empty nests than Thompson’s lower extreme this year, with the Top Tank north and Frank’s Point colonies holding only 1.11% and 1.67% empty nests respectively; intriguingly these two colonies have also contained the lowest proportion of empty nests in each of the last two years, with the former containing only 1.96% in 2016 and 7.45% in 2015. Overall, of 517 visited nests, 9.86% were found to be empty this year (17.62% in 2016, 17.30% in 2015, 16.32% in 2014 and 19.84% in 2013). It was unclear whether the empty nests were second nests made by the pairs present, nests which had been robbed of eggs or nests where the adults had yet to lay. The breeding season was certainly a protracted one, with the first chicks located on 24<sup>th</sup> May (20<sup>th</sup> May in 2016), other birds still incubating eggs on 5<sup>th</sup> July (two days before the first fledgling took to the wing) and with two youngsters still with half-grown primaries on 15<sup>th</sup> August. It would thus seem likely that at least in some cases the latter two of the above three options may have been the case, meaning that the Skokholm breeding population is actually higher than that suggested above. However, even if we wrongly assume that all empty nests belonged to additional pairs, the predicted Island total would only be in the region of 1235 pairs (an extra 112 pairs and still the lowest population estimate for over 50 years).

The breeding success of the Skokholm Lesser Black-backed Gull population has been low for many years and is a major factor contributing to the observed population decline. The poor success has been linked to a reduction in food availability during the chick rearing period, primarily due to changes in the fishing industry (for example in Thompson, 2007). Studies on Skomer in the 1970s and 1980s suggested that earthworms were an important adult food item during the egg incubation period but that adults switched to taking fish during the chick provisioning period. The decline in reproductive success has been attributed to a failure to make this switch in food, with regurgitate studies suggesting that chicks are fed on earthworms in years of poor productivity. Circumstantial evidence suggested that hot, dry summers resulted in productivity being further reduced, perhaps

due to earthworms being less available in dry conditions (Thompson, 2007). The 2014 tracking data suggested that the majority of adult birds did make a switch to maritime feeding during the chick rearing period, a switch which may have been responsible for the improved productivity witnessed that season. In 2015, a year which saw productivity drop to a typically low level, the tracking data suggested that far fewer birds made the switch to maritime feeding in June and July, although it was not known whether the tracked birds had chicks (see the 2015 and 2016 Skokholm Seabird Reports).



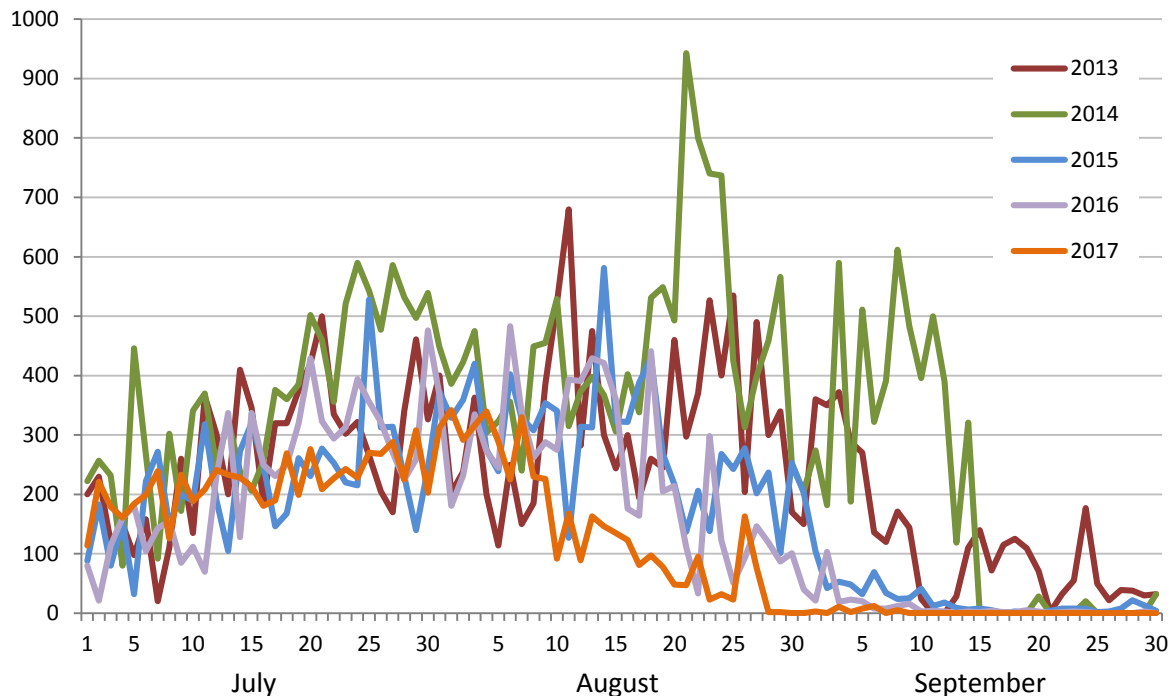
The colonies at Frank's Point and to the north of the Top Tank again proved suitable for productivity monitoring this year (using BTO rings as a mark for a mark/recapture population estimate). In an attempt to increase the number of resightings, the colonies were again re-entered this season (rather than observing fledglings at a distance with a telescope, a method which was failing to locate any rings due to the long vegetation which has resulted from recent low Rabbit numbers). A simple calculation was again used, (number of fledglings ringed x number checked for rings on second visit)/ number of birds found to have rings on second visit, to predict the number of fledglings within the area. There were 12 fledglings ringed at the Top Tank and, of 19 subsequently checked for rings, five were marked; it is thus predicted that the 89 pairs produced 45.6 fledglings, giving a productivity figure of 0.51. There were four fledglings ringed at Frank's Point and, of only three birds subsequently checked, one was marked; it is thus predicted that the 97 pairs produced only 12 fledglings, giving a productivity figure of 0.12. Additionally a third plot was used on the coastal slope of Purple Cove, a discreet subcolony with very short sward or rocky substrate where it was possible to accurately count the number of fledglings with a telescope; here 18 pairs had produced a

minimum of 20 fledglings, giving a productivity figure of 1.11 per pair. That productivity was so much higher in a smaller, coastal subcolony fits ad hoc observations made in recent years and perhaps supports the theory that the birds in the larger colonies are struggling in part due to intraspecific predation. Pooling the 2017 observations suggests that 204 pairs produced 77.6 young and that overall productivity was in the region of 0.38 fledglings per pair. Observations from elsewhere also suggested that productivity in 2017 was up on recent years; although fledglings at North Pond could potentially have come from anywhere on Skokholm, the 133 counted there on 1<sup>st</sup> August was 8.1% up on the peak 2016 count, 95.6% up on the 2015 maximum and 4.7% up on 2014 (which was up until 2017 the most productive year of the last ten).

**Lesser Black-backed Gull productivity estimates.**

| 2004 | 2005 | 2008 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|------|
| 0.07 | 0.27 | 0.27 | 0.03 | 0.16 | 0.16 | 0.30 | 0.15 | 0.23 | 0.38 |

**The number of Lesser Black-backed Gulls roosting on North Plain and in the vicinity of North Pond 2013-2017.**



North Plain and the area around North Pond again proved to be the usual site for the largest post breeding roost, with smaller numbers congregating around the coast and at South Pond. As is typically the case, the number of birds using the roosts increased during July, however, despite the larger number of fledglings produced, there were fewer birds present this year; the July total was 6.4% down on 2016 and the lowest of the last five years. The highest July count, the 308 logged on the 29<sup>th</sup>, was 35.3% down on the 2016 peak. As in the previous four years, the majority of the largest roost counts were logged in August, however the number of roosting birds tailed off quickly after the first week of the month and the peak counts were well down on recent years; the August total was 41.5% down on last year and the peak count, the 342 logged on the 1<sup>st</sup>, was 29.2% down on 2016, 41.1% down on 2015 and 63.7% down on the 2014 high of 943 roosting birds. September proved similarly disappointing, with only 41 roosting birds logged during the entire month; the last three years have seen very small September roosts, quite the contrast to 2013 and 2014 when counts were still regularly in the hundreds. A small number of birds visited Skokholm in October, with 44 logged over 17 dates and a high of 12 on the 31<sup>st</sup>, and in November when there were daily sightings to the 8<sup>th</sup>, also totalling 44 birds and with a high of 11 on the 5<sup>th</sup>.

**Ringing recovery GC34122**

**Originally ringed** as a chick, SKOMER ISLAND, PEMBROKESHIRE 17<sup>th</sup> July 2006

**Recovered** NORTH POND, SKOKHOLM 14<sup>th</sup> July 2017

**Finding condition** Recently dead

**Distance travelled** 4km at 163 degrees (SSE)

**Days since ringed** 4015

**Ringing recovery GR77022**

**Originally ringed** as an adult, HOME MEADOW GULL TRAP, SKOKHOLM 19<sup>th</sup> May 2013

**Recovered** SKOMER ISLAND, PEMBROKESHIRE 22<sup>nd</sup> May 2017

**Finding condition** Breeding adult nest trapped and colour ringed green with white AI above left knee

**Subsequently resighted** SKOMER ISLAND, PEMBROKESHIRE 24<sup>th</sup> May 2017

**Distance travelled** 4km at 343 degrees (NNW)

**Days since ringed** 1464 and 1466

Our GPS tagged birds, along with an additional 48 non-tagged controls, were all fitted with yellow darvic rings with a black alpha-numeric code (number/letter:W e.g. 5A:W) in 2014. The colour ring is on the left leg and a BTO metal ring on the right. The darvic rings have yielded a fantastic number of field resightings; the 73 ringed birds have produced 143 separate resightings of 33 different individuals away from Skokholm. The following table summarises resightings received since similar tables were published in the 2016, 2015 and 2014 Seabird Reports. As has been shown by the British Trust for Ornithology GPS tracking project (see above) and at other British Trust for Ornithology tracking sites (Ross-Smith, *pers. comm.*), Lesser Black-backed Gulls show a high degree of wintering site fidelity. This is also reflected in the colour ringing data, with 15 birds having been resighted at the same location in successive winters; records of returning birds have come from several sites in Portugal and Spain along with two in France and one in Morocco.

| Darvic | Ring    | Location                      | Country  | Date                         |
|--------|---------|-------------------------------|----------|------------------------------|
| 5C:W   | GR98202 | Nevern Estuary, Pembrokeshire | UK       | 21/02/17                     |
| 5H:W   | GR98204 | Malaga Harbour                | Spain    | 06/12/16, 21/01/17           |
| 6A:W   | GR98215 | Anza                          | Morocco  | 05/01/17, 12/01/17           |
| 6N:W   | GR98223 | Isla Canela Beach, Ayamonte   | Spain    | 24/01/17                     |
| 6U:W   | GR98226 | Figueira da Foz               | Portugal | 14/11/17                     |
| 6U:W   | GR98226 | Malaga Harbour                | Spain    | 19/02/18, 24/02/18           |
| 7N:W   | GR98240 | Langford Lakes, Wiltshire     | UK       | 25/01/17                     |
| 7X:W   | GR98245 | Courant de Mimizan, Landes    | France   | 12/01/17                     |
| 8A:W   | GR98247 | Praia da Caparica, Lisbon     | Portugal | 14/09/17, 30/09/17           |
| 8V:W   | GR98260 | El Jadida Landfill            | Morocco  | 09/01/17, 10/01/17           |
| 9H:W   | GR98264 | Leixões harbour, Matosinhos   | Portugal | 01/09/17, 02/10/17, 13/10/17 |
| 9J:W   | GR98265 | Barbate Harbour, Cadiz        | Spain    | 23/02/17                     |
| 9J:W   | GR98265 | Malaga Harbour                | Spain    | 09/12/17, 03/01/18           |
| 9U:W   | GR98273 | Sonzay's Landfill, Loiret     | France   | 17/01/17, 16/12/17, 15/02/18 |
| 9Y:W   | GR98276 | Portimao Harbour, Faro        | Portugal | 15/01/17, 03/03/17, 14/01/18 |

**Larus hybrid** *Larus fuscus* x *Larus argentatus*

**Scarce Breeder**

The apparent hybrid, which has held territory with a Lesser Black-backed Gull above South Haven in at least the previous four seasons, was not seen until 29<sup>th</sup> May when it appeared alone in the vicinity of its usual territory (see photographs of this bird in the 2015 and 2014 Seabird Reports). It was not seen again until it reappeared alone and in the same area on 3<sup>rd</sup> November, an absence which

perhaps suggests that it has lost its usual partner. The only other hybrid noted in 2017, and possibly the same bird, was at North Pond on 2<sup>nd</sup> June. Whether these hybrids are remnants of cross-fostering experiments (500 Herring Gull and 400 Lesser Black-backed Gull chicks were raised by adults of the ‘wrong’ species between 1963 and 1966 with the result that they frequently paired with the species of the adopting parents) or whether they are the result of natural interbreeding, is unclear. The latter may certainly be the case on occasion; an apparently pure male Herring Gull was watched as it mounted an apparently pure female Lesser Black-backed Gull in Crab Bay on 30<sup>th</sup> April 2016, although these birds were not paired and had same-species partners incubating on nests positioned in close proximity to each other.

**Herring Gull *Larus argentatus***

**Gwylan y Penwaig**

**Common Breeder** abundant breeder in the 1970s

20 trapped, 1 retrapped, 1 control

1936-1976: 13,164 trapped, 2013-2016: 68 trapped, 12 retrapped

Counts in March again fluctuated widely, with birds frequently feeding away from Skokholm but returning to roost on the Neck. The peak March count of 176 logged on the 27<sup>th</sup> was the lowest of the last six years and April counts were similarly down; this reflected both lower numbers of subadult birds and a lack of feeding flocks around the Island (although up to 55 were seen following potting boats on occasion). The first egg, found opposite the Devil’s Teeth on 18<sup>th</sup> April, was one day later than the first of 2016 (the first egg was found on 25<sup>th</sup> April in 2015, 14<sup>th</sup> April in 2014 and 18<sup>th</sup> April in 2013). It became apparent during April that the male of the pair which had frequented the Courtyard for at least the previous four years was missing; the female quickly attracted two different males to the territory, but she departed towards the end of the month. Whole Island counts took place between the 18<sup>th</sup> and 20<sup>th</sup> May when 296 active nests were located and an additional six nests were found on the back of the Stack during boat-based surveys on 28<sup>th</sup> May. A whole Island total of 302 active nests was a 6.2% drop on the 322 nests of 2016 but marginally up on the 2007-2016 mean (297.7 ±sd 29.75); there have only been four higher totals since 2001. The number of breeding pairs has apparently stabilised at a level close to that seen in the 1930s (the 1928-1937 mean was 269.70 ±sd 17.47), counts well down on the artificial peak of the 1970s.

**The number of breeding pairs 1928-2017 (where data exists). The 1970s peak was attributed to the exploitation of local fish waste and the decline to botulism (Thompson, 2007).**



The monitoring of adult survival in Herring Gulls has been undertaken on Skomer for many years, however recent struggles with trapping sufficient adult birds to produce a reliable estimate led to the Island Conservation Advisory Committee recommending that a project be established on

Skokholm. The Neck was selected as the Skokholm study area and 13 nesting adults were trapped there between the 18<sup>th</sup> and 22<sup>nd</sup> May this year. Each trapped adult was ringed with a red darvic inscribed W:9\*\* in white, the latter two digits identifying the bird as an individual. Two of the birds were subsequently seen away from Skokholm, with W:989 visiting the nearby Gann on 31<sup>st</sup> July and W:987 reaching the Nevern Estuary, Newport on 30<sup>th</sup> September.

The first chicks were seen at Warden’s Rest on 22<sup>nd</sup> May and the first flying fledglings were logged on 7<sup>th</sup> July (30<sup>th</sup> June in 2016, 10<sup>th</sup> July in 2015, 2<sup>nd</sup> July in 2014 and 7<sup>th</sup> July in 2013). Checks of the Neck productivity plot in early July, where 125 pairs had established nests, located a maximum of 88 fledging-sized young (which equates to a productivity estimate of 0.70 fledged young per pair). This was 18.6% down on the 0.86 logged in 2016 and 9.1% down on the 2007-2016 mean (0.77 ±se 0.05). Nevertheless there have been lower productivity estimates in six of the previous 13 years and, following a good year in 2016, it appears that current levels are sufficient to sustain a stable breeding population at this time. Herring Gull productivity remains consistently higher than that of the closely related Lesser Black-backed Gull, circumstantial evidence suggesting that this may be due to differing feeding habits. Additionally Great Black-backed Gulls seemingly target the coastal nesting Herring Gulls less frequently than they do the inland gull colonies, although predation by Greats was again witnessed around the Neck this year and probably led to an underestimate of the breeding population due to the emptying of nests prior to the whole Island count.

**The number of breeding pairs and productivity estimates (average number of fledglings per sample pair) 2004-2017.**

| 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 287  | 255  | 265  | 320  | 287  | 353  | 312  | 257  | 274  | 263  | 300  | 289  | 322  | 302  |
| 0.18 | 0.57 | 0.47 | 0.61 | -    | -    | 0.82 | 0.67 | 1.15 | 0.72 | 0.70 | 0.66 | 0.86 | 0.70 |



In contrast to the lower than average spring counts, it proved a productive autumn. Following the customary departure of both adults and fledglings in late July, the highest August counts of the last five years peaked at 348 on the 26<sup>th</sup> and 409 on the 27<sup>th</sup> when swarming ants across North Plain, the Neck and Horse Bottom provided a popular source of food. As in the previous four seasons, few Herring Gulls visited Skokholm in September, with daily totals of 70 or less primarily made up of



birds feeding offshore. October counts remained low until the 26<sup>th</sup> when 185 birds returned to territories around the Neck. The following days saw large numbers of birds feeding with the smaller gulls in Broad Sound, with highs of 493 on the 27<sup>th</sup> and 364 on the 31<sup>st</sup>, the former being the highest October count on record. Early November proved similarly productive, with highs of 540 on the 2<sup>nd</sup> and 612 on the 3<sup>rd</sup>, the latter marginally up on the 2016 record of 588 and the 585 of 2015.

**Ringling recovery** Left leg blue darvic with orange 128, right leg GN84214

**Originally ringed** as an adult, GLOUCESTER LANDFILL SITE, GLOUCESTERSHIRE 26<sup>th</sup> November 2005

**Previously resighted** as an adult, GLOUCESTER LANDFILL, GLOUCESTERSHIRE 7<sup>th</sup> January 2006

**Previously resighted** as an adult, GLOUCESTER LANDFILL, GLOUCESTERSHIRE 3<sup>rd</sup> February 2006

**Previously resighted** as an adult, GLOUCESTER LANDFILL, GLOUCESTERSHIRE 30<sup>th</sup> November 2010

**Previously resighted** as an adult, GLOUCESTER LANDFILL, GLOUCESTERSHIRE 3<sup>rd</sup> December 2010

**Recovered** as an adult, FAR BAY, SKOKHOLM 20<sup>th</sup> May 2017

**Finding condition** Ring read in field

**Distance travelled** 206km at 265 degrees (W)

**Days since ringed** 4193

**Great Black-backed Gull** *Larus marinus*

**Gwylan Gefnddu Fwyaf**

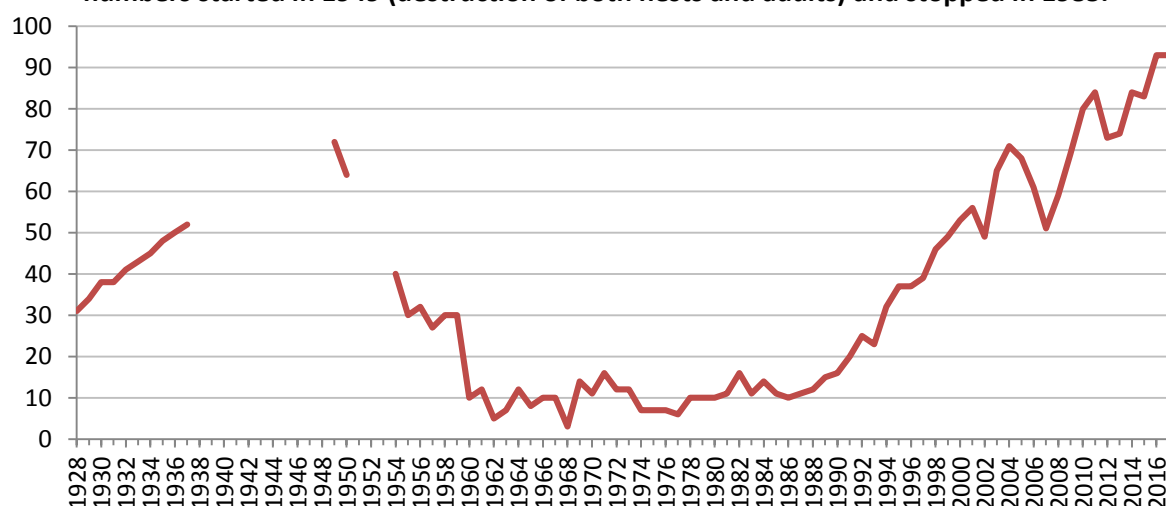
**Fairly Common Breeder and Common Visitor**

44 trapped (including 37 pulli), 1 retrapped

1936-1976: 219 trapped, 2013-2016: 235 trapped, 7 retrapped, 4 controls

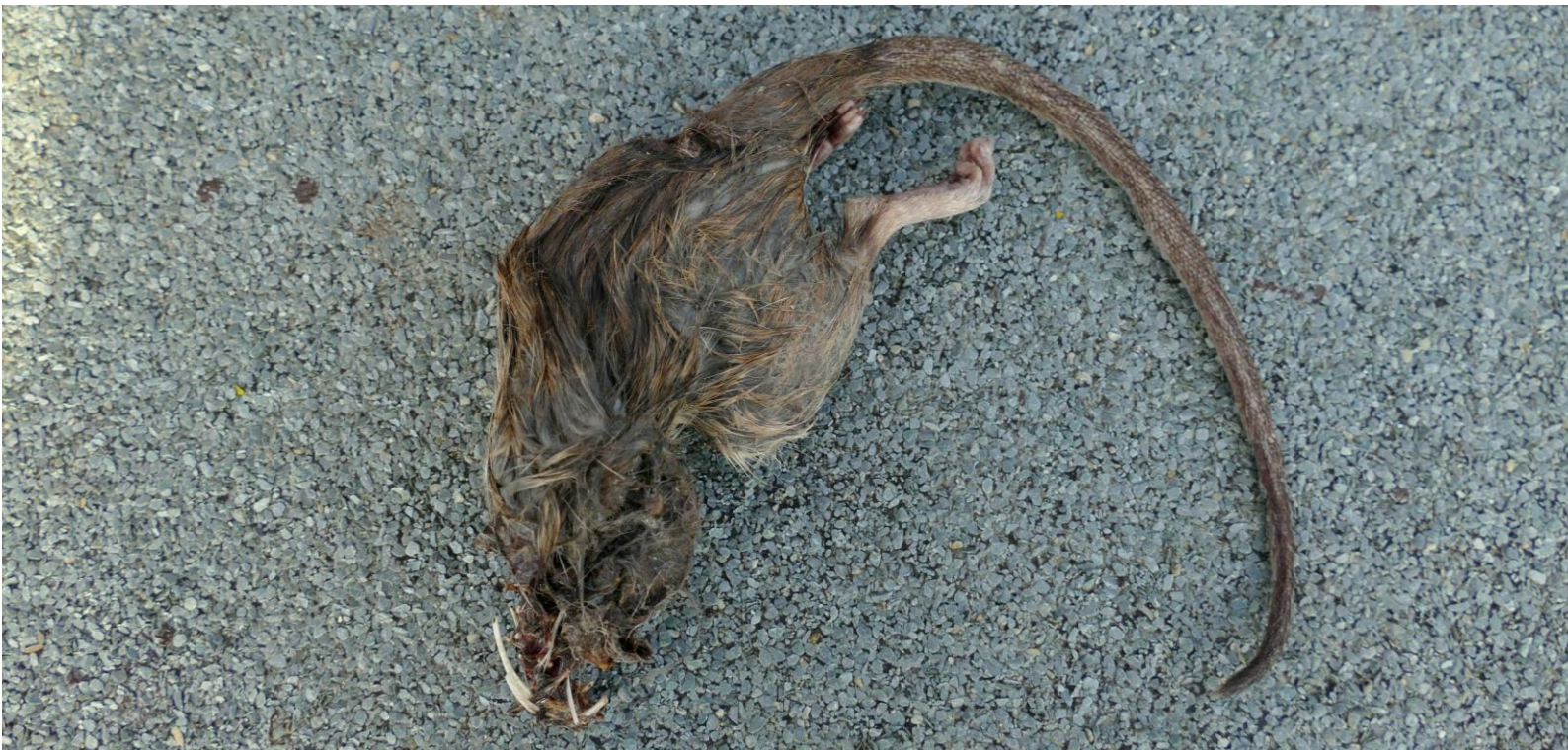
This year saw spring totals at the Bog roost very similar to the previous four years, with a March high of 48 on the 19<sup>th</sup> (March highs were 48 in 2016, 37 in 2015 and 34 in 2014) and April highs of 52 on the 4<sup>th</sup>, 58 (including ten subadults) on the 8<sup>th</sup> and 53 (including 11 subadults) on the 29<sup>th</sup> (April highs were 58 in 2016, 63 in 2015 and 54 in 2014); the sizable roost which formed at the Bog during the early part of the 2013 season, which peaked at 213 individuals, again failed to materialise. A whole Island census on 19<sup>th</sup> May located 91 apparently incubating adults (86 accessible nests contained eggs) and a further two nests were encountered over the following ten days. A total of 93 nesting pairs was the same as mapped in 2016 and the most yet recorded on Skokholm.

**The number of Great Black-backed Gull breeding pairs 1928-2017 (where data exists). Control of numbers started in 1949 (destruction of both nests and adults) and stopped in 1985.**



The increase in the population is in part being driven by a high adult return rate; of 33 adults bearing colour rings in 2016, 32 (97.0%) returned to the same territories this year and one was not seen. As all of the adults present on Skokholm this breeding season were checked for rings, it seems likely that this is a very good approximation of survival. Of 23 adult birds ringed in 2014, 19 (82.6%)

returned in 2015 and none of the four missing birds were encountered in the two subsequent years. Of 21 ringed adults in 2015, 19 (90.5%) returned in 2016 and neither of the two missing birds were encountered this year. Although survival is clearly high, four unringed dead found on Skokholm following the 2016-2017 winter suggests that this may be a more challenging period for them. On 3<sup>rd</sup> August this year an adult arrived to the Lighthouse with a bloody leg which was missing its foot, the cause of which was perhaps most likely to be entanglement in fishing gear. Great Black-backed Gulls were again regularly observed behind fishing vessels, with a peak of 20 seen alongside Boy's Pride on 17<sup>th</sup> August; an important step in understanding the Skokholm Great Black-backed Gull population will be to discover if such anthropogenic food sources are regularly exploited, particularly during periods of low seabird or Rabbit numbers when they may increase survival.



We were joined this season by Katherine Westerberg, an undergraduate supervised by Dr Stephen Votier at the University of Exeter, here to investigate Great Black-backed Gull diet during the breeding season. Regurgitated pellets and carcasses were collected at 26 nest sites from 7<sup>th</sup> May until 9<sup>th</sup> July when chicks had moved away from their natal areas; prey remains could no longer be confidently assigned to a particular nest after this period. In total, 1035 pellets and 81 carcasses were collected. Birds (primarily Manx Shearwaters) and mammals (Rabbits, with low levels of Sheep and a Brown Rat) accounted for the majority of the remains, making up 48.2% and 38.1% respectively. Only the back half of the rat was present, perhaps suggesting that it was a road or ploughing casualty and almost certainly not from the Island (photograph above). The remains of Pheasant and domestic fowl were found in a small number of pellets, both indicating that some pairs forage on the mainland. This was further illustrated by the third main food source, refuse, which made up 7.3% of pellets. The types of refuse present, mainly plastic waste and packaging, suggested that birds were travelling away from the Island to landfill sites; the nearest landfills are located 17km and 20km from the Island. Whitefish, invertebrates (crustaceans and molluscs), eggs and vegetation were also present in collected pellets, but only in small proportions, whilst more unusual prey items recorded away from the study nests included an adult Rook, a female Mallard and a Crow chick. Prey sources varied greatly between pairs, with pellets at some nest sites made up almost entirely of Rabbit remains, whilst others contained almost exclusively Manx Shearwaters. Other pairs were

apparently generalists, with pellets containing a wide range of prey. Variation in the proportion of anthropogenic material present at nests, which ranged from 54.5% to zero, also implies that different pairs have different diets. Differences between the diets of the study pairs will be the main focus of Katherine's dissertation and further analyses will be used to determine the levels of specialisation present. Understanding dietary specialisation is key to making management decisions regarding the impact of Great Black-backed Gulls on their prey species.

The Great Black-backed Gulls are spectacular apex predators and an exciting component of the Skokholm seabird assemblage, however it is important that we monitor the impact of these high breeding numbers on the Manx Shearwater population. Dead Manx Shearwaters were counted for a fourth consecutive year, the vast majority of which had been predated by Great Black-backed Gulls; a total of 3360 corpses, comprising 2071 adults and 1289 youngsters, were marked this year (3697 comprising 2299 adults and 1398 youngsters in 2016, 4026 comprising 2702 adults and 1324 young in 2015 and 4219 comprising 2931 adults and 1288 young in 2014). This was thus the third year in succession that the number of dead adult shearwaters has fallen, with a 9.9% drop this year following a 14.9% drop in 2016 and a 7.8% drop in 2015. Although at first this may appear to be good news, it is possible that a decline in the number of corpses may reflect a decline in the number of shearwaters available. Younger pre-breeding shearwaters are believed to comprise the majority of predated birds (although ringing has shown that old breeders are also taken), but the number of birds present on Skokholm in this age cohort is something of an unknown as current survey work focuses on the breeding population. Fluctuating Rabbit numbers complicate the picture further, with the lowest Rabbit counts coinciding with the 2014 peak in shearwater mortality (see the Manx Shearwater section above for more details). Interestingly the number of youngsters predated this year fell within the relatively tight range observed over the previous three years. Ultimately more data is required to understand the effect of gull and Rabbit numbers on the Manx Shearwater population; although the number of dead birds currently being found represents a relatively small proportion of the Skokholm shearwater population, it seems likely that continued growth of the Great Black-backed Gull population will increase their impact on the shearwaters.



The first egg of the year was found along Medicine Rock Wall on 18<sup>th</sup> April; the first two of 2016 were found on the 12<sup>th</sup>, the first two of 2015 on the 19<sup>th</sup> and the first of 2014 on the 10<sup>th</sup>. Of 26

monitored nests, three pairs failed at the egg incubation or small chick stage, four pairs failed having hatched chicks, five pairs fledged a singleton, seven pairs fledged two and seven pairs fledged three. There were thus 40 fledglings and a productivity figure of 1.54 fledged young per monitored pair; productivity was thus 11.6% up on 2016, 41.3% up on the 1989-2004 mean of 1.09 and 30.5% up on the 2007-2016 mean (1.18 ±se 0.12). Although eggs and young were typically lost to other Great Black-backed Gulls, a Raven was seen to take a chick on 26<sup>th</sup> May.

**Productivity estimates 2005-2017 (average number of fledglings per sample pair).**

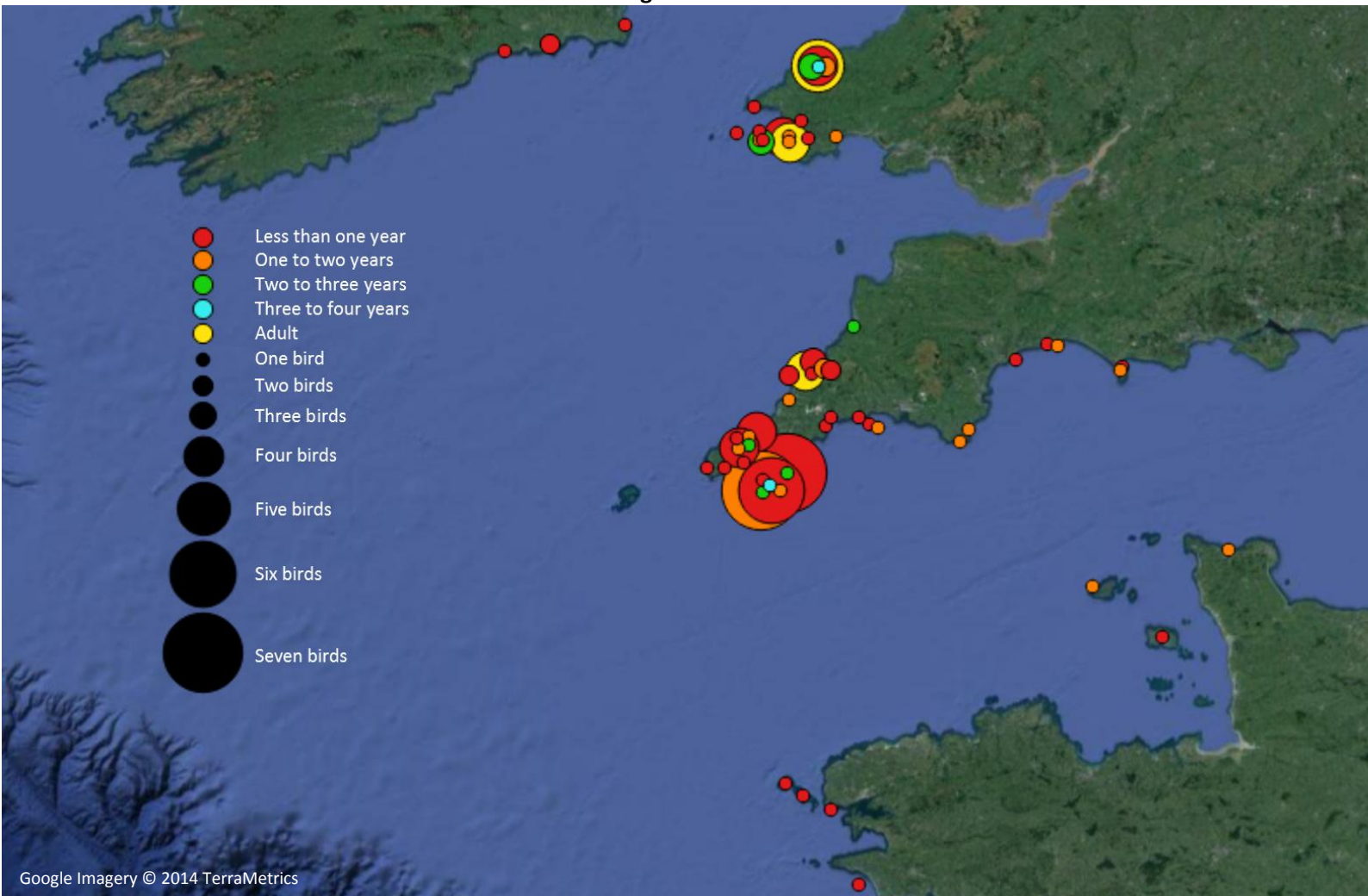
| 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 0.76 | 1.07 | 1.02 | 1.02 | -    | 0.71 | 0.89 | -    | 1.80 | 0.93 | 1.66 | 1.38 | 1.54 |

In an effort to further understand observed population growth, a Great Black-backed Gull colour ringing project was begun in 2014, in part to shed light on juvenile survival and recruitment. Of 43 fledglings ringed in 2014, 26 (60.47%) have been resighted subsequently and five have been found dead. At least 15 birds (34.88%) definitely survived their first full year, ten (23.26%) survived their second years and five (11.63%) have survived at least three years. Of 52 fledglings ringed in 2015, 20 (38.46%) have been resighted subsequently, 11 (21.15%) have survived their first full year and seven (13.46%) have survived their second. Ten of the 28 2016 fledglings have been seen again, four (14.29%) have survived their first year and three have been found dead (including one at Portland, Dorset with fishing line wrapped around its legs, apparently a regular cause of death in that area). These survival estimates are more accurate for the birds ringed in 2014 as there has been longer to look for them, however clearly these figures do not give an exact measure of juvenile survival. Only time will tell whether this study provides a good estimate of survival to breeding age, something which may well be dependent on how many birds return as adults to Skokholm or Skomer (where they should be seen) as opposed to other less studied breeding sites. Six youngsters have so far returned to Skokholm, two of which were back in their first summers, two in their second summers and two in their third summers. Although the resighting records will be somewhat biased by a preponderance of birders at the main roost sites in Cornwall, it seems likely that there is a genuine southerly bias to the movements of young Skokholm Great Black-backed Gulls (see map below). All of the records below were received since a similar table was published in the 2016 Seabird Report.

| Darvic | Ring    | Location            | County        | Age           | Date               |
|--------|---------|---------------------|---------------|---------------|--------------------|
| W:025  | HT94870 | Nevern Estuary      | Pembrokeshire | Adult         | 21/02/17           |
| W:026  | HT94871 | Nevern Estuary      | Pembrokeshire | Adult         | 27/03/17           |
| W:027  | HT94872 | Nevern Estuary      | Pembrokeshire | Adult         | 08/03/17, 14/03/17 |
| W:029  | HT94874 | Camel Estuary       | Cornwall      | Adult         | 13/01/17, 03/12/17 |
| W:031  | HT94876 | Camel Estuary       | Cornwall      | Adult         | 03/12/17           |
| W:032  | HT94877 | Nevern Estuary      | Pembrokeshire | Adult         | 12/06/17           |
| W:032  | HT94877 | Pentewan Sands      | Cornwall      | Adult         | 13/12/17           |
| W:037  | HT94899 | The Lizard          | Cornwall      | Fourth Winter | 06/01/18           |
| W:048  | HT94909 | Hayle Estuary       | Cornwall      | Third Winter  | 18/01/17           |
| W:055  | HT94917 | Nevern Estuary      | Pembrokeshire | Fourth Winter | 19/01/17, 20/11/17 |
| W:060  | HT94921 | Camel Estuary       | Cornwall      | Fourth Winter | 28/10/17           |
| W:060  | HT94921 | The Lizard          | Cornwall      | Fourth Winter | 07/11/17           |
| W:071  | HT94897 | Widemouth Bay, Bude | Cornwall      | Third Winter  | 15/01/17 (dead)    |
| W:073  | HT94930 | Nevern Estuary      | Pembrokeshire | Third Winter  | 14/12/16           |
| W:079  | HT94936 | Nevern Estuary      | Pembrokeshire | Adult         | 27/03/17, 26/06/17 |
| W:081  | HT94938 | Gann Estuary        | Pembrokeshire | Second Winter | 19/03/17           |
| W:089  | HT94950 | Hayle Estuary       | Cornwall      | Second Winter | 24/02/17           |
| W:089  | HT94950 | Gwithian            | Cornwall      | Third Winter  | 09/02/18           |
| W:094  | HT94957 | Nevern Estuary      | Pembrokeshire | Third Winter  | 18/03/17, 21/12/17 |

|              |         |                    |                    |              |                    |
|--------------|---------|--------------------|--------------------|--------------|--------------------|
| <b>W:109</b> | HT94972 | The Lizard         | Cornwall           | Third Winter | 13/03/17, 30/11/17 |
| <b>W:112</b> | HT94974 | Nevern Estuary     | Pembrokeshire      | Third Winter | 04/09/17           |
| <b>W:116</b> | HT94976 | Coverack           | Cornwall           | Third Winter | 21/10/17           |
| <b>W:124</b> | HT94955 | Coverack           | Cornwall           | Third Winter | 22/12/17           |
| <b>W:152</b> | MA37809 | Prawle Point       | Devon              | First Summer | 05/07/17           |
| <b>W:152</b> | MA37809 | Portland           | Dorset             | First Summer | 16/08/17 (dead)    |
| <b>W:156</b> | MA37813 | Boatstrand Harbour | Waterford, IRELAND | First Winter | 14/03/17           |
| <b>W:160</b> | MA37818 | The Lizard         | Cornwall           | First Summer | 25/06/17           |
| <b>W:169</b> | MA37827 | Coverack           | Cornwall           | First Winter | 27/01/17           |
| <b>W:173</b> | MA37832 | Coverack           | Cornwall           | First Winter | 26/01/17, 10/03/17 |
| <b>W:193</b> | MA37860 | Skokholm           | Pembrokeshire      | First Winter | 03/11/17           |
| <b>W:195</b> | MA37862 | Coverack           | Cornwall           | First Winter | 02/11/17           |
| <b>W:211</b> | MA37876 | Sennen Cove        | Cornwall           | First Winter | 10/09/17           |
| <b>W:214</b> | MA37879 | Nevern Estuary     | Pembrokeshire      | First Winter | 10/10/17, 29/10/17 |

### The movements of Skokholm ringed Great Black-backed Gulls 2014-2017.



A roost of up to 52 birds, but more typically less than 35, frequently formed in the Bog during the breeding season, totals slightly up on 2016 but down on 2015 when there were regular counts of up to 40 birds and a peak of 82 on 27<sup>th</sup> May; the majority of 2017 birds were in full adult plumage, although there were up to seven subadults regularly in May. The first fledglings were recorded during the first week of July however, with the exception of August roosts of 53 on the 14<sup>th</sup>, 52 on

the 18<sup>th</sup> and 60 on the 24<sup>th</sup>, it was not until September that larger communal roosts formed. North Plain, North Pond and the area to the north of the Sugarloaf again proved the most popular post-breeding roost sites, with peak September counts of 173 on the 11<sup>th</sup>, 174 on the 13<sup>th</sup> and 183 on the 15<sup>th</sup>; numbers were thus down on September 2016, when there were six counts in excess of 200 birds and a peak of 247 on the 14<sup>th</sup>, down on the 2015 peak of 249 and well down on the September 2013 peak of 355 (the September 2014 maximum was only 52). The first fledgling to be recorded away from Skokholm was at Sennen Cove, Cornwall on 10<sup>th</sup> September, 20 days earlier than the first southwest resighting of 2016 and five days earlier than the first of 2015. There were only two October counts in excess of 100 individuals (seven counts in 2016), with highs of 141 on the 2<sup>nd</sup> and 109 on the 11<sup>th</sup>. There were 69 or fewer birds logged each day from 12<sup>th</sup> October and 28 or fewer from the 22<sup>nd</sup> until the departure of staff on 9<sup>th</sup> November. November counts were thus the lowest of the last five years and well down on the 2013 highs of 270 and 243 (both of which occurred in the first five days of the month).



## Literature Cited

- Betts, M. (1992) **Birds of Skokholm**. Dyfed Wildlife Trust
- Betts, M. (1994) **Storm Petrels on Skokholm 1994**. Unpublished report for the Dyfed Wildlife Trust
- Brooke, M. de L. (1990) **The Manx Shearwater**. Poyser
- Brown, R. and Eagle, G. (2013) **Skokholm Seabird Report 2013**. Online report for the Wildlife Trust of South and West Wales. [www.welshwildlife.org/about-us/skokholm-reports/](http://www.welshwildlife.org/about-us/skokholm-reports/)
- Brown, R. and Eagle, G. (2014) **Skokholm Seabird Report 2014**. Online report for the Wildlife Trust of South and West Wales. [www.welshwildlife.org/about-us/skokholm-reports/](http://www.welshwildlife.org/about-us/skokholm-reports/)
- Brown, R. and Eagle, G. (2015) **Skokholm Seabird Report 2015**. Online report for the Wildlife Trust of South and West Wales. [www.welshwildlife.org/about-us/skokholm-reports/](http://www.welshwildlife.org/about-us/skokholm-reports/)
- Brown, R. and Eagle, G. (2016) **Skokholm Seabird Report 2016**. Online report for the Wildlife Trust of South and West Wales. [www.welshwildlife.org/about-us/skokholm-reports/](http://www.welshwildlife.org/about-us/skokholm-reports/)
- Ferguson-Lees, J., Castell, R. and Leech, D. (2011) **A Field Guide To Monitoring Nests**. BTO
- Gillham, J. and Yates, L. (2012) **Skokholm Island Annual Report 2012**. Unpublished report for the Wildlife Trust of South and West Wales
- Gynn, E. (1984) **Dead shearwaters on Skokholm**. Bulletin of the Friends of Skomer and Skokholm 7:10-11
- Harris, M., Heubeck, M., Shaw, D. and Okill, D. (2006) **Dramatic changes in the return date of Guillemots *Uria aalge* to colonies in Shetland, 1962-2005**. Bird Study 53: 247-252

- Harris, M., Heubeck, M., Newell, M. and Wanless, S. (2015) **The need for year-specific correction factors (k values) when converting counts of individual Common Guillemots *Uria aalge* to breeding pairs.** *Bird Study* 62 (2): 276-279
- Humphreys, E.M., Wanless, S. and Bryant, D.M. (2007) **Elevated metabolic costs while resting on water in a surface feeder: the Black-legged Kittiwake *Rissa tridactyla*.** *Ibis* 149: 106-111
- Smith, S., Thompson, G.V.F. and Perrins, C.M. (2001) **A census of the Manx Shearwater *Puffinus puffinus* on Skomer, Skokholm and Middleholm, west Wales.** *Bird Study* 48: 330-340
- Sutcliffe, S.J. (2010) **Storm Petrels on Skokholm.** Unpublished review for the Countryside Council for Wales and the Wildlife Trust of South & West Wales
- Sutcliffe, S.J. and Vaughan, D. (2011) **Storm Petrel monitoring on Skokholm.** Unpublished report for the Wildlife Trust of South and West Wales
- Thompson, G.V.F. (2003) **Storm Petrel census on Skokholm in 2003.** Contract science report number 673, Countryside Council for Wales
- Thompson, G.V.F. (2007) **The natural history of Skokholm Island.** Trafford Publishing
- Vaughan, D. and Gibbons, D.W. (1996) **Storm Petrel census on Skokholm Island, 1995.** Report to Countryside Council for Wales, RSPB and Dyfed Wildlife Trust
- Vaughan, D. (2001) **Storm Petrel census of Skokholm Island, Pembrokeshire, 2001.** Report to JNCC and the Wildlife Trust of South and West Wales
- Walsh, P.M., Halley, D.J., Harris, M.P., del Nevo, A., Sim, I.M.W. & Tasker, M.L. (1995) **Seabird monitoring handbook for Britain and Ireland.** JNCC/RSPB/ITE/Seabird Group, Peterborough
- Wood, M.J., Taylor, V., Wilson, A., Padget, O., Andrews, H., Buche, B., Cox, N., Green, R., Hooley, T-A., Newman, L., Miquel-Riera, E., Perfect, S., Stubings, E., Taylor, E., Taylor, J., Moss, J., Eagle, G. & Brown, R.D. (2017) **Repeat playback census of breeding European Storm Petrels on the Skokholm and Skomer SPA in 2016.** Unpublished report for Natural Resources Wales

Manx Shearwater near the Lighthouse © Bart Vercruyssen & Pol Dewulf, Fulmar chick © Jacob Peterken, Manx Shearwater in flight © Bart Vercruyssen & Pol Dewulf, rafting Manx Shearwaters © Bart Vercruyssen, Storm Petrel in flight © Bart Vercruyssen & Pol Dewulf, Puffin in flight, Herring Gull with Puffin, Herring Gulls with Puffin and Great Black-backed Gull missing a Puffin © Richard Coles  
All other photographs © Richard Brown and Giselle Eagle

Report compiled by Richard Brown and Giselle Eagle with Great Black-backed Gull diet analysis by Katherine Westerberg

This work was funded in part by Natural Resources Wales



**Cyfoeth  
Naturiol  
Cymru  
Natural  
Resources  
Wales**