

## CLIFF NESTING SEABIRDS ON LUNDY: POPULATION TRENDS FROM 1981 TO 2017

by

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### ABSTRACT

In the first week of June 2017 the breeding population and distribution of seabirds on Lundy (with the exception of *Larus* gulls, Manx Shearwater and Storm Petrel) was surveyed using a repeat of the methodology from the previous surveys that have run approximately four yearly since 1981. The results show an increase in many species, particularly since rat eradication, and indicate that Lundy's importance as a seabird island is gradually being restored.

Keywords: *Lundy*, *Guillemot*, *Razorbill*, *Puffin*, *rats*

### INTRODUCTION

Lundy is one of the most important sites in south west England for breeding seabirds and is a Site of Special Scientific Interest (SSSI) for Manx shearwater (*Puffinus puffinus*), Puffin (*Fratercula arctica*), Guillemot (*Uria aalge*), Razorbill (*Alca torda*) and Kittiwake (*Rissa tridactyla*). It is one of only two locations in England supporting breeding Manx Shearwater and Storm Petrel (the other being the Isles of Scilly), and one of the few where Puffins breed. Lundy's cliff nesting seabirds have been monitored on a four to five yearly cycle since 1981. Herring Gulls (*Larus argentatus*), Lesser Black-Backed Gulls (*L. fuscus*) and Great Black-Backed Gulls (*L. marinus*) have been surveyed at the same time, but in a less intensive way, with an estimated count of nests taken. The first full survey of the island's Manx Shearwaters was undertaken in 2001 and trial surveys for Storm Petrel began in 2016 following confirmation of breeding in 2014.

In June 2017, a repeat survey of the cliff nesting seabirds was undertaken as part of this survey cycle for Guillemots, Razorbills, Puffins, Kittiwakes, Fulmars (*Fulmaris glacialis*) and Shags (*Phalacrocorax aristotelis*).

### METHODOLOGY

The survey was conducted between 3 and 10 June 2017, using a direct repeat of methods from previous surveys, the most recent conducted in 2013 (Price *et al.* 2014). The survey method is based on the published standard methods for surveying each

species (Walsh *et al.*, 1995). Every section of coastal cliff was monitored from vantage points, using a register to record numbers of breeding seabirds at each site.

Auks (Guillemots, Razorbills and Puffins) are difficult to survey accurately and the published methods have been adapted to make a whole island census practical for Lundy. The adapted technique means the results are therefore a representative indication of breeding numbers allowing direct comparison between surveys. For Guillemots and Razorbills the count unit is individual birds occupying breeding sites. Puffins are also counted individually, but including birds on the sea adjacent to breeding cliffs. Walsh *et al.* (1995) suggest at least five counts should be made; however, because of the size of the task on Lundy and the time available for survey, this has been adapted to two counts of the main nesting areas and a single count of others. However, weather conditions during the 2017 survey were not favourable with several days of wet and windy weather, and it was therefore not possible to complete the usual two visits to the busier colonies and each site was only surveyed once.

For Kittiwakes and Shags, which construct an obvious nest, a count of Apparently Occupied Nests (AONs) was made, and for Fulmars (which make no nest, but lay their eggs on suitable ledges), the count unit was Apparently Occupied Sites (AOSs), taking care to avoid including birds just sitting on the ledges but not breeding.

Up to 2013, the register used to identify vantage points and record observations was based on line drawings of the cliffs and an old map base that was hard for the inexperienced eye to decipher and locate the survey vantage points. For 2017, the register was updated to a photographic based document for ease of reference, enabling future surveyors that may be less familiar with the cliffs to locate the sites. A copy of the site register is held by the RSPB at the Exeter office.

Though estimated numbers of occupied nests (AONs) of each *Larus* gull species were recorded when possible, the time pressure due to the adverse weather conditions meant that detailed surveying was not possible, and full coverage was not achieved. As such the results are incomplete and not at all representative, and are therefore not included in this report.

**Plate 1:** Peter Slader checking the site register at Jenny's Cove.  
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## RESULTS

### Overview of species totals and trends

Despite the inclement weather and the lack of a second visit to the main west coast sites (from Jenny's Cove to NW point), a full island count was undertaken for all species except the gulls. These results are presented in Table 1, which provides a breakdown of the target species by coastal sections and the pattern of counts, emphasising the importance of the rugged west coast.

**Table 1:** Overview of results for cliff nesting species in 2017 by survey count section

| Section                         | Guillemot (ind.) | Razorbill (ind.) | Puffin (ind.) | Kittiwake (AON) | Fulmar (AOS) | Shag (AON) |
|---------------------------------|------------------|------------------|---------------|-----------------|--------------|------------|
| A: South Light to Shutter Rock  | 10               | 94               | 0             | 0               | 1            | 1          |
| B: Shutter Rock to Old Light    | 31               | 151              | 0             | 0               | 1            | 9          |
| C: Old Light to Battery Point   | 0                | 20               | 0             | 0               | 0            | 0          |
| D: Battery Point to Needle Rock | 125              | 67               | 31            | 0               | 38           | 1          |
| E: Needle Rock to Pyramid       | 2,727            | 397              | 198           | 59              | 103          | 3          |
| F: Pyramid to St James Stone    | 2,028            | 366              | 57            | 179             | 10           | 3          |
| G: St James Stone to NW Point   | 1,262            | 532              | 58            | 0               | 29           | 21         |
| H: NW Point to NE Point         | 1                | 8                | 20            | 0               | 0            | 0          |
| I: NE Point to Gannets Rock     | 12               | 12               | 11            | 0               | 39           | 1          |
| J: Gannets Rock to Brazen Ward  | 0                | 31               | 0             | 0               | 0            | 0          |
| K: Brazen Ward to Halfway Wall  | 2                | 11               | 0             | 0               | 6            | 6          |
| L: Halfway Wall to South Light  | 0                | 46               | 0             | 0               | 0            | 10         |
| <b>Totals</b>                   | <b>6,198</b>     | <b>1,735</b>     | <b>375</b>    | <b>238</b>      | <b>227</b>   | <b>55</b>  |

The total all-island counts for 2017 for each species are also presented in Table 2 along with the count totals from the previous nine surveys, providing an indication of species trends over the past 36 years. For the auks in particular this presents a picture of remarkable increases in numbers, continuing the encouraging improvement in numbers observed in the 2013 survey, and for most species counts now well exceed the figures for the last national seabird census, Seabird 2000.

**Table 2:** Numbers of cliff nesting seabirds between 1981 and 2017

| Year             | Guillemot (ind.) | Razorbill (ind.) | Puffin (ind.) | Kittiwake (AON) | Fulmar (AOS) | Shag (AON) |
|------------------|------------------|------------------|---------------|-----------------|--------------|------------|
| 1981             | 2,197            | 991              | 129           | 933             | 109          | 29         |
| 1982             | 1,979            | 861              | 87            | 911             | 117          | 43         |
| 1986             | 2,096            | 761              | 39            | 718             | 185          | 35         |
| 1992             | 2,628            | 791              | 37            | 407             | 174          | 22         |
| 1996             | 1,914            | 951              | 15            | 392             | 202          | 37         |
| 2000             | 2,348            | 950              | 13            | 237             | 190          | 56         |
| 2004             | 2,321            | 841              | 5             | 148             | 178          | 63         |
| 2008             | 3,302            | 1,045            | 14            | 151             | 170          | 63         |
| 2013             | 4,114            | 1,324            | 80            | 127             | 209          | 112        |
| 2017             | 6,198            | 1,735            | 375           | 238             | 227          | 55         |
| Change 2013-2017 | +51%             | +31%             | +369%         | +87%            | +9%          | -51%       |
| Change 2000-2017 | +164%            | +82%             | +2,784%       | 0%              | +19%         | 0%         |

## Species Accounts

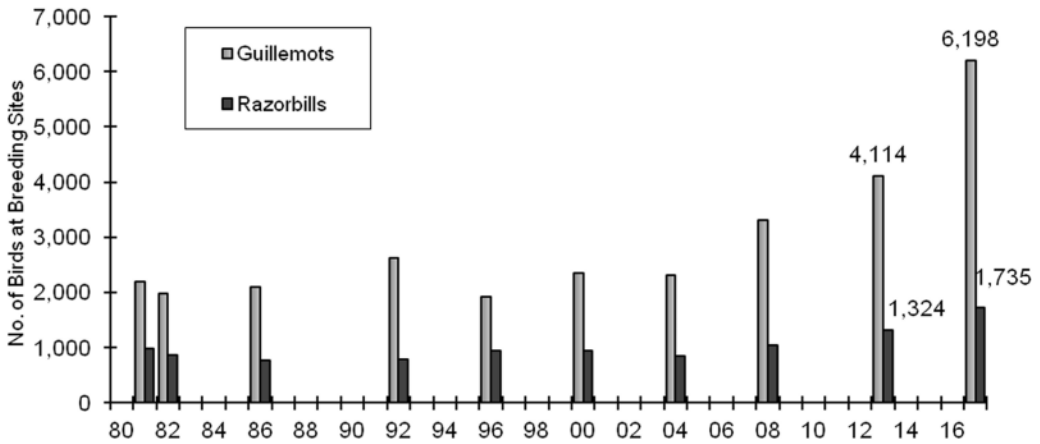
### *Guillemot and Razorbill*

Guillemots are the second most numerous seabird species breeding on Lundy (after Manx shearwater) with an estimated 6,198 individuals in 2017, which represents a staggering 51% increase on the 2013 figure and a continuation of increasing numbers since 2004. Lundy now supports almost three times the number of guillemots recorded in 2004, and the population is currently at a level not seen since the late 1940s (Davis and Jones 2007).

The pattern of site occupancy remained similar between this survey and the last with Jenny's Cove to NW Point (sections E, F and G in Table 1) continuing to support the majority of birds and showing the greatest increase in numbers since 2013. Section F (Pyramid to St James Stone) has seen an increase of 557 birds, whilst numbers in Jenny's Cove have increased by 1,323 birds in this four year period, and interestingly, they have recolonised Devil's Chimney, which was abandoned some twenty years ago in 1996. (It is salutary to recognise that the number of Guillemots now occupying Jenny's Cove exceeds the totals obtained for the whole of Lundy in any of the surveys prior to 2008 (as illustrated in Tables 1 and 2).

Razorbills have also increased steadily since 2004 with 1,735 individuals recorded in 2017 representing a 31% increase on the previous survey. The pattern of change is rather variable around the island. Birds are often exploiting previously unoccupied areas of broken ground and clefts in cliffs and generally colonising new sites, with sizeable increases in numbers along the south coast as well as from Jenny’s Cove northwards.

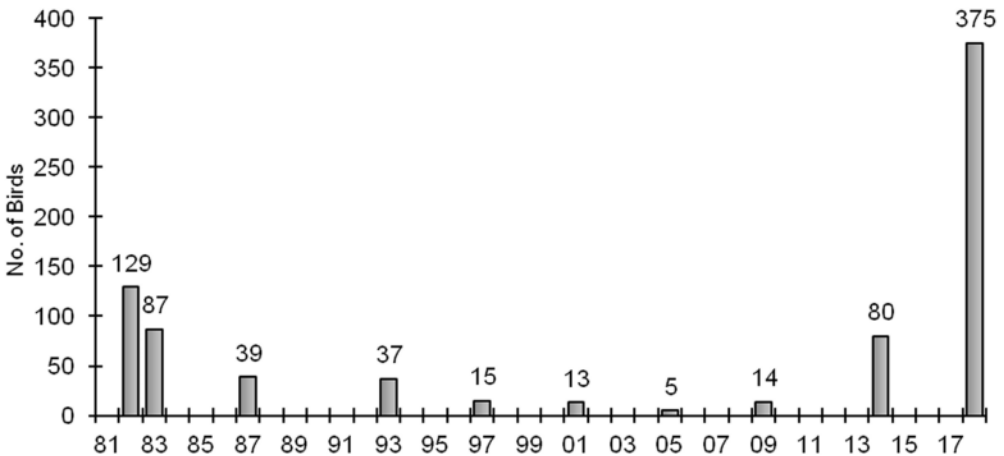
The populations of Guillemots and Razorbills is illustrated in Figure 1 below, showing the relatively stable populations until 2004, followed by marked increases, especially for Guillemots.



**Figure 1:** Guillemot and razorbill population change since 1981 (individuals)

***Puffin***

An amazing total of 375 puffins was recorded in 2017, a population level not seen since the early 1950s. This compares to 80 in 2013 and just 5 birds in 2004. As with the other auks, 2004 was a turning point and their fortunes have radically improved since then, as illustrated in Figure 2.



**Figure 2:** Puffin population change since 1981 (individuals)

Table 3 shows that Puffins now occur in all six of the coastal sections extending up along the west coast from Battery Point northwards and around to Gannets Rock. In 2013, though numbers had increased, all but four of the birds recorded were still confined to Jenny's Cove and the north of St Philip's Point. The most important area is still Jenny's Cove, where numbers have swelled from 61 birds in 2013 to 198 in 2017, an increase of 137.

**Table 3:** Puffin population change since 2004 by coastal section

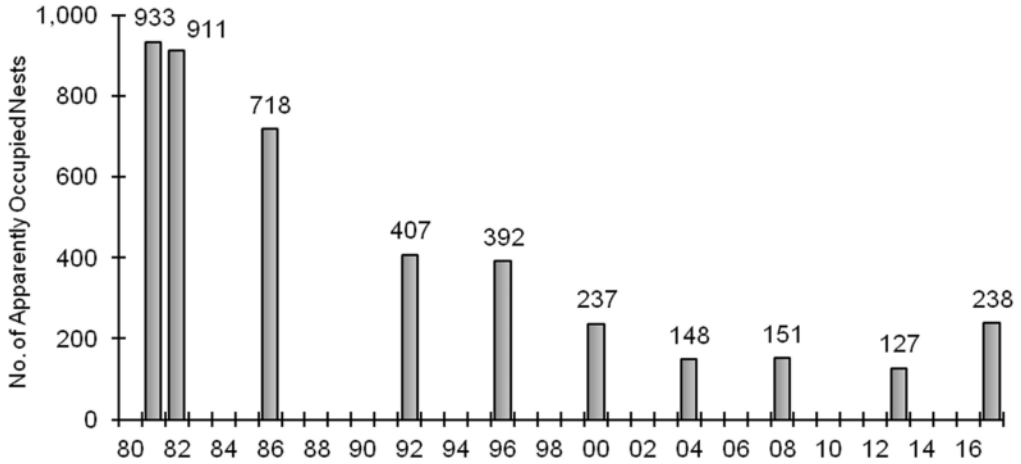
| Section                         | 2004     | 2008      | 2013      | 2017       |
|---------------------------------|----------|-----------|-----------|------------|
| A: South Light to Shutter Rock  |          |           |           |            |
| B: Shutter Rock to Old Light    |          |           |           |            |
| C: Old Light to Battery Point   |          |           |           |            |
| D: Battery Point to Needle Rock |          |           | 1         | 31         |
| E: Needle Rock to Pyramid       |          | 6         | 61        | 198        |
| F: Pyramid to St James Stone    | 5        | 8         | 15        | 57         |
| G: St James Stone to NW Point   |          |           | 3         | 58         |
| H: NW Point to NE Point         |          |           |           | 20         |
| I: NE Point to Gannets Rock     |          |           |           | 11         |
| J: Gannets Rock to Brazen Ward  |          |           |           |            |
| K: Brazen Ward to Halfway Wall  |          |           |           |            |
| L: Halfway Wall to South Light  |          |           |           |            |
| <b>Total</b>                    | <b>5</b> | <b>14</b> | <b>80</b> | <b>375</b> |



**Plate 2:** Puffins at Jenny's Cove in 2016. © Elisabeth Price

***Kittiwakes***

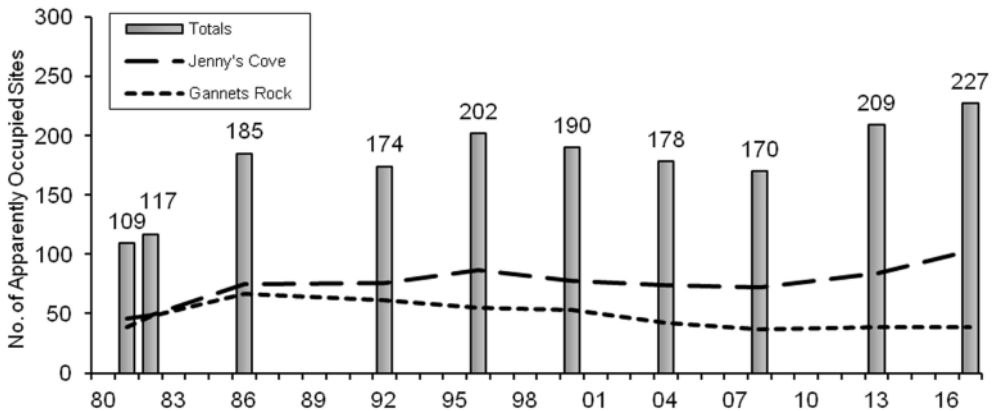
The apparently inexorable decline in kittiwakes since 1981 showed signs of levelling out in 2008 (see Figure 3) and in 2017 actually showed a welcome upturn in numbers from 127 AONs in 2013 to 238 in 2017 (an 87% increase). The huge colony of some 400 pairs crammed into Puffin Gully in 1981 and 1982 had been abandoned along with virtually all other sites by 2004, with just single figure counts in Jenny's Cove and the only significant concentration of birds at two sites between St Philip's Point and St James Stone in Section F. The increase to 59 AONs in Jenny's Cove in 2017, and the improved numbers at the two Section F colonies (from 119 to 179 AONs), is an encouraging sign.



**Figure 3:** Kittiwake population on Lundy from 1981 to 2017 (AONs)

***Fulmar***

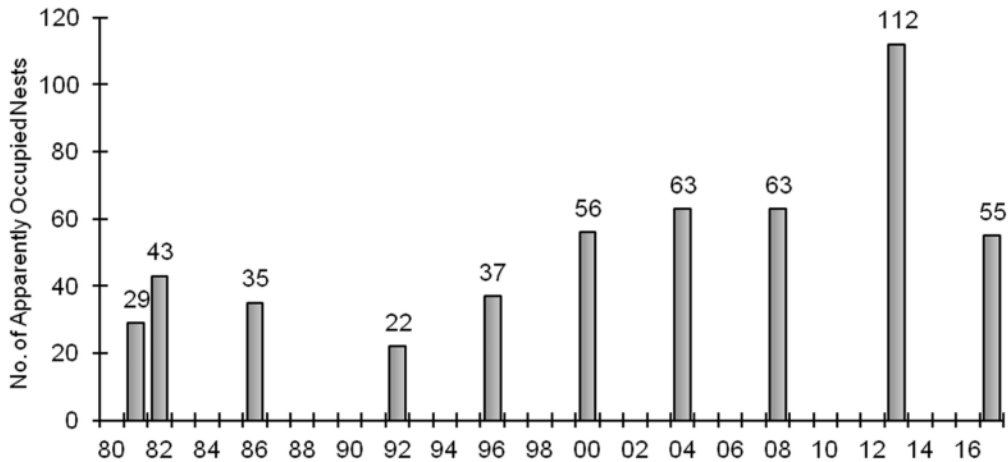
The 2017 survey produced a further increase in Fulmars to 227 AOSs, the highest count since 1981. Patterns of site occupancy and numbers within these sites were similar to that of the previous survey. However, the long term movement away from the east coast (and from Gannets Rock in particular), and the colonisation of Jenny's Cove and elsewhere along the west coast continues, with an increase of 19 AOSs in Jenny's Cove, and a small decrease (from 14 to 6 AOSs) between Brazen Ward and Halfway Wall (Section K) on the east coast.



**Figure 4:** Fulmar breeding numbers from 1981 to 2017 (AOSs)

**Shag**

The timing of seabird surveys on Lundy (typically late May-early June) has been chosen to obtain best results for counts of auks and does not necessarily favour the surveying of breeding shags. Shags nest earlier than the other seabirds and it is quite possible that breeding at some sites has finished prior to the usual survey period. Also, some birds may choose not to breed at all in some years, particularly if food availability is poor. Nesting shag numbers from the surveys therefore need to be treated with some caution. Though the 2017 figure of 55 AONs is far below the 112 AONs recorded in 2013, it is more in line with that of previous surveys up to 2008, and probably indicates a relatively stable population.



**Figure 5:** Change in number of recorded shag AONs since 1981

Shags require a relatively large flat area to build a nest and very much prefer it to be inconspicuously sited under a large rock or in a crevice. With sheer cliffs around much of the island such sites are relatively limited and most of the nests found on Lundy are sited along the break in slope at the top of cliffs or in areas of fallen boulders and rocks. The relatively flat-top of Goat Island (near South West Point) is a favoured location, as are some of the more broken cliff faces north of St Philip's Point, with a scattering of birds along the lower cliffs of the east coast around Halfway Wall Bay.

**Gulls**

It was not possible to accurately survey the *Larus* gulls in 2017 and therefore no results are presented. Further survey for these species will be carried out in 2018.

**DISCUSSION**

Weather conditions were particularly adverse during the week of the survey and, though full single counts for the target species were obtained, surveying of gulls was compromised. In years when a second count is feasible for auks in the main breeding areas, the maximum count from the two visits is used. If a second visit to the main sites had been possible in 2017, the lower count would have been discarded. Consequently, the 2017 counts are considered a potential under-estimate for these species.



The positive trend for most seabirds on Lundy builds on those reported in 2013 (Price *et al.*, 2014). Despite the constraints of the weather during the survey and as a result being limited to single counts, there are stark changes in numbers that provide a real indication of trend over the last four years. National trends reported by JNCC show that Lundy's seabirds are generally faring well compared to the wider UK. JNCC's trend information is based on a sample of monitored colonies and compares these to the last national census, Seabird 2000. The latest trend information is not available for Puffins; however Guillemots have increased by 5% nationally between Seabird 2000 and 2015 and Razorbills by 32% in the same period (JNCC, 2016). The population increases for Lundy are considerably more for these species at 164% and 82% respectively between 2000 and 2017.

Fulmar numbers have decreased nationally by 31% between Seabird 2000 and 2015, whereas on Lundy they have increased by 19% between 2000 and 2017. Shags have declined nationally by 34% and Kittiwakes by 44% in the same period (JNCC 2016). On Lundy, despite some variability during this period, the populations for Kittiwakes and Shags in 2000 and in 2017 were virtually the same (a difference of just one nesting pair for both species).

The dramatic increase in the Puffin population and substantial increases in Guillemot and to a lesser extent Razorbill, have occurred since 2004. This pattern is also coincident with the increase in Manx Shearwaters (Booker and Price, 2014) and ahead of the more recent colonisation of Storm Petrels (Taylor, 2014). The absence of rats, which were eradicated from Lundy over the winters of 2002/03 and 2003/04 (Appleton *et al.*, 2006) is probably the main driver for such positive changes. Rat predation of eggs and chicks is most likely to have affected the burrow nesting species, Manx shearwater and Puffin, and be the reason behind the absence of breeding Storm Petrels. It is also probable that rats suppressed the population of Razorbills, which nest in crevices.

**Plate 3:** Guillemots occupying the broken ground above the cliff in 2016.  
© Elisabeth Price



Further evidence to support a response to the absence of rats is a shifting distribution of auks, with Guillemots, Razorbills and Puffins now nesting higher up into the broken ground where the cliff top meets the steep grassy coastal slopes and the habitat becomes a complex mix with rock, soil and broken ground providing numerous nesting opportunities. These areas were previously occupied by rats but are now available as safe nest sites. The change is particularly apparent at Jenny’s Cove where breeding numbers of most species have seen the biggest increase. Plate 3 was taken in 2016 and illustrates the use of this habitat by Guillemots.

Seabirds require both safe nesting sites and adequate food to be able to breed successfully. Therefore alongside the absence of rats, the increase in so many of Lundy’s seabird species has to be supported by adequate prey availability within the species’ foraging range from the island. Thaxter *et al.* (2012) provide the following average foraging ranges for auks.

**Table 4:** Published foraging ranges for Guillemot, Razorbill and Puffin

|           | Foraging Ranges (km) |         |
|-----------|----------------------|---------|
|           | Mean Maximum         | Average |
| Puffin    | 105.4                | 4.0     |
| Guillemot | 84.2                 | 37.8    |
| Razorbill | 45.8                 | 23.7    |

Mean maximum=the average of the maximum ranges from all studies

Though the specific foraging ranges of Lundy’s auks have not been studied, the increases in the populations of these species suggests that prey is currently plentiful within a few tens of kilometres from the island. Data from Lundy’s Manx Shearwaters, a species able to undertake foraging trips of over 300km (Thaxter *et al.*, 2012), indicates that whilst some birds travel long distances, many foraging trips take place in local waters around the island and off the Cornwall coast (Freeman *et al.*, 2012). Such local foraging suggests that the seas around Lundy can be rich in food.

Guillemot numbers are now at their highest recorded by any complete island census since an estimate of 19,000 pairs in 1939 (Perry, 1940). By 1949 numbers had apparently fallen to around 3,500 individuals, and when Barbara Whittaker, warden at the time, carried out the next comprehensive all-island counts in 1955 and 1956 the numbers recorded were 3,850 and 3,910 respectively (Davis and Jones, 2007). By the time of the Operation Seafarer survey in 1969 numbers had declined to 1,647 individuals. Between 1969 and 2004 numbers fluctuated around 2,000 birds, and after this date, coinciding with rat removal, numbers began their substantial increase (Davis and Jones, 2007; Price and Booker, 2008 and Price *et al.*, 2014).

The story is similar, but less pronounced, for Razorbills. Perry estimated 10,500 breeding pairs in 1939 and since then the highest whole island count was in 1962 when 2,130 individuals were recorded (Davis and Jones 2007). After this date, numbers

declined to the all-time low of 761 individuals in 1986 (Price, 1986) after which, as with Guillemot, they fluctuated up to 2004 before beginning the steady increase to their current level.

Favourable conditions for foraging, both prey abundance and accessibility, is also the likely reason for the upturn in breeding Kittiwakes, which, until this year, have largely been in decline since surveys began in 1981. It seems highly unlikely rats reached the Kittiwake ledges and most probable that this species has been affected by other factors such as a lack of prey availability. The situation on Lundy is not unique; in addition to the -44% UK trend described above, 58% of colonies from southern English counties (from Kent to Isles of Scilly and including Lundy) have been abandoned between 1986 and 2014 and the remaining colonies have declined by 66% between 2000 and 2014 (McMurdo Hamilton *et al.*, 2016). McMurdo Hamilton *et al.* reviewed the publications suggesting causes of decline in Kittiwakes in southern England, which indicate that weather conditions, frontal system patterns and predation are amongst the reasons for the decline in southern populations.

As already noted, assessing the breeding population of Shags requires survey work over several months to cope with their asynchronous breeding. However, in the absence of any other data, it would seem that the 2017 survey results, which are consistent with the general trend over recent years, indicate there is no major cause for concern. If anything the absence of rats from the areas of broken ground at the top of the cliffs and in the scree slopes may well be a positive factor in providing nests sites with less chance of predation and encouraging occupation of more such areas.

## CONCLUSIONS

The importance of Lundy for breeding seabirds continues to grow with many species faring better on Lundy than across the UK generally. The island is home to many thousands of seabirds during the breeding season and has the potential to support many more if conditions remain suitable. Maintenance of the island's rat-free status, combined with well managed seas, is essential to ensure that the island's seabird species can continue to thrive. There is still uncertainty over the latest trends in *Larus* gulls as these could not be adequately surveyed this year and these populations should be fully counted in 2018.

Ongoing regular monitoring of all Lundy's seabirds will help provide a measure of the overall health of Lundy's nesting habitats and the seas around it. The results from the 2017 survey suggest that the future for most species of seabird on Lundy is promising and that the island is gradually regaining its historic importance as a major seabird colony.

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