

**ATLANTIC PUFFIN (*Fratercula arctica*)
POPULATION & PRODUCTIVITY ON LUNDY SUMMER 2008**

By

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ABSTRACT

Between April and July 2008 a total of 24 survey visits were made to St Philip's Stone. The study was carried out to ascertain the number of Puffins on Lundy and to determine breeding success. The 2008 survey showed potential breeding activity at five burrows at the St Philip's Stone colony. Feeding was observed at four burrows, indicating successful breeding. Chicks were seen at two separate burrows. Two additional breeding sites were identified at Jenny's Cove, where Puffins were observed entering burrows at both sites. Successful breeding is thought to have taken place at one of these sites where feeding was observed at two burrows.

Keywords: Puffin, Breeding, Numbers, Lundy

INTRODUCTION

This report contains the results of a simple land-based survey, using methodologies previously established by Davey (1998), Cole (2000) and Saunders & Wheatley (2008a, 2008b). The site references are taken from the Lundy Site Register in Price (2004), a document detailing nest sites and viewing locations for all of Lundy's nesting seabirds.

The study was centred on St Philip's Stone (site F4), the only known Puffin colony since 2000. During the breeding season, Puffins were also observed on land at burrows in Jenny's Cove (sites E4 & E8).

The main survey was conducted by the Lundy wardens at St Philip's Stone, with a total of 24 site visits made during the breeding season. Opportunistic visits were made to Jenny's Cove. These data have been supplemented by visitor sightings extracted from the LFS Logbook.

METHODS

Location Survey – St Philip's Stone (F4)

Surveys were carried out at St Philip's Stone, a north-facing slope just to the south of Threequarter Wall and St Mark's Stone, which corresponds to site F4 in the Lundy Site Register (Price, 2004). Observations were made from the viewing platform designated as Fe (Price, 2004) using 8 x 32 binoculars and a 48 x 60 telescope.

A site photograph was labelled with known burrows to correspond with data from observations in 2006 and 2007 and a grid was then superimposed onto the photograph to assist with recording Puffin observations. Puffins seen entering burrows

on at least two separate occasions before the end of May were assumed to be breeding and were included in the sample (Walsh *et al.*, 1995). Breeding success was determined later in the season by recording the burrows into which Puffins were observed taking fish.

RESULTS

Location Survey – St Philip's Stone (F4)

A total of 24 surveys were conducted between April and July 2008, with a combined observation effort of over 75 hours. All Puffin activity was monitored and a summary produced for each survey. These are shown in Table 1.

Surveys of St Philip's Stone commenced on 15 April 2008 and the first Puffin was observed there on 15 April.

Five breeding pairs were identified at St Philip's Stone (burrows C, D, E, H & I), all of which were observed entering burrows on numerous occasions throughout May. Puffins were observed taking fish into four of these five burrows, indicating successful breeding and giving a productivity of 0.8 young per pair (Puffins rear just a single chick).

Five potential new burrows were identified in the 2008 survey (burrows J, K L, M & N) and Puffin activity was recorded in burrows A, B and G, all of which were not occupied or visited in 2007.

Logbook records

Between April and July, a total of 55 Puffin observations and 366 individual sightings were recorded in the LFS Logbook. The first sighting of the year was on 8 April and the last on 1 August.

Logbook observations

Observations from the logbook are listed in Table 2.

Previous censuses have been conducted during the first few days of June, before the arrival of fully grown birds of pre-breeding age that are prospecting for possible future breeding sites. To enable comparison with historical data, observations between 1 June and 14 June 2008 were extracted from the logbook (Table 2 observations in **bold**). Thirty-two observations were recorded with sufficient site detail to enable comparison and each observation was allocated to the appropriate coastal section A–L (Price, 2004). The maximum number of Puffins observed in each section at any one time was used to compare the number of Puffins on Lundy in 2008 against previous years. The observation effort from the logbook far exceeds that of the annual census and therefore direct comparisons should be made with caution, although the 2007 and 2008 logbook figures can be considered a direct comparison given that the methodologies used to produce the figures were the same. The RSPB/Natural England breeding seabird census (conducted once every four years, including 2008) usually takes place over a shorter time period and in 2008 this ran from 1–6 June and returned a figure of 14 Puffins (all recorded from either Jenny's Cove or St Philip's

Stone). LFS Logbook data over the same time period gave the number of Puffins as 4 and 24 for 2007 and 2008 respectively.

Table 3 shows the total numbers and distribution of Puffins on Lundy for nine years between 1981 and 2008.

It should be noted that many of these observations were of birds on the water and the later in the season the observation is made, the less likely it is that they can be assumed to be breeders. Non-breeders are far more mobile, and birds observed away from the known breeding sites may well be non-breeders. In addition, small groups of birds observed on the water in different locations on different days may include the same individuals, making an overestimation of the number present possible. This is particularly true of the ten birds observed at Gannets' Rock on 14 June, when even more immature birds may have come in. While the presence of additional immature birds from mid-June may make assessing breeding numbers more difficult, their presence in increasing numbers is encouraging as they themselves may nest on the island in subsequent years.

In view of the above, the 40 birds recorded between 1 June and 14 June 2008 are likely to be an overestimation of the population size, but it certainly indicates an upward trend and is an increase on the number of Puffins recorded using the same methodologies in 2007. Given the differing methodologies and timescales, the combination of seabird census results and LFS Logbook entries between 1 June and 6 June is likely to provide the best estimate of population size.

Puffins present before June would almost certainly be breeding adults and analysis of the records in the same manner as above gives a maximum of 15 individuals, all in study plots E, H or F. This is a fairly close reflection of the breeding numbers.

DISCUSSION

Survey results indicate that there were four successful breeding attempts at St Philip's Stone in 2008. Burrows C, D, E and H were occupied from mid-April or early May. It can be assumed that four chicks hatched successfully as adults at each of these burrows were observed with food. Confirmed chick sightings were made at burrow E on 17 July (Sherman, pers. comm.) and C on 24 July (Blet-Charaudeau & Marshall, pers. comm.)

Burrows for which the outcome was unknown or uncertain had the following histories:

Burrow I – although regular activity was recorded, no feeding was observed; breeding was assumed to be unsuccessful.

Burrow A – first identified as occupied on 29 May; a pair was observed at this burrow during every survey until 13 July.

Burrow B – first observation made on 29 May; Puffins visiting the burrow twice in late June may have been third-year birds.

Burrows L, M & N were all identified in July.

According to Jones (1998), second-year birds rarely come ashore, and if they do, they rarely enter burrows. Third-year, pre-breeding birds come ashore from the mid-

incubation period and will inspect burrows, but do not occupy them for long. Many fourth-year birds will occupy burrows for prolonged periods, and a few will breed (Jones, 1998).

The 2008 survey results show that although present for a prolonged period, the pair at burrow A did not breed and they may well be fourth-year birds that will attempt breeding in subsequent years. The dates of Puffin observations at burrows J (14 May), K (22 May) and B (29 May) may have been too early for third-year birds, and it could be that the pair that settled at burrow A from 29 May made these earlier visits while prospecting for a potential burrow. Puffins seen entering burrows B, L, M and N during later observations were assumed to be third-year birds.

From 5 June onwards, a number of Puffins present could not be associated with a particular burrow. The highest count of unassociated Puffins was seven individuals. Jones (1998) reports that social aggregations of non-breeders are commonplace and it is assumed that these birds were in their third or fourth year. It is impossible to distinguish these birds from those observed prospecting other burrows and it is worth noting that during the high counts of unassociated birds, no simultaneous counts at the prospective burrows were made.

It is also noteworthy that an individual Puffin was observed on land at St Mark's Inlet (F13) on 23 June, suggesting birds of pre-breeding age may have been exploring other sites for future breeding.

Puffins are extremely loyal to their natal colony but also need to see that other Puffins are present before they will land to look for a nest site. New colonies are therefore extremely rare and traditional colonies that have been deserted rarely re-establish (Boag & Alexander, 1986). However, Harris (2009) states that immature Puffins may visit several colonies hundreds of kilometres apart in order to assess the site before choosing a location to nest. In 2008, land observations were recorded at two sites at Jenny's Cove – the first confirmed land sightings at these sites since 2000. Assuming these were young adults, this is a positive sign for the future. Harris (pers. comm.) suggests that once a Puffin pair has selected a burrow and settled into breeding, they will not visit another colony during the breeding season. In 2009, the survey will be extended to include the two new Jenny's Cove sites, which should give us an accurate estimation of the total number of breeding pairs.

One reason for this apparent upturn in the fortunes of Lundy's Puffins is almost certainly the success of the Seabird Recovery Project and its successful eradication of the island's rats (Appleton *et al.*, 2006). Boag and Alexander (1986) suggest that, taking into account productivity rates, longevity and survival rates, a colony can benefit from a 75% increase in 25 years, or 3% per annum assuming other environmental factors remain stable. In 1958, the Isle of May had just five breeding pairs of Puffins but by 1986 the population had increased to an estimated 10,000 pairs. While it is unlikely that Lundy's Puffin population will show such a remarkable increase – especially given the climatic and other factors adversely affecting Puffin populations in other areas – 2008 was an interesting year and may mark the beginning of a turning point.

CONCLUSION

In conclusion, the St Philip's Stone colony in 2008 had five breeding pairs (burrows C, D, E, H & I), four of which bred successfully. Observations at Jenny's Cove suggest two pairs attempted breeding at burrow E8, giving an island total of seven breeding pairs. In addition, it is assumed there was a minimum of seven non-breeding individuals.

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Table 1. Summary of results for St Philip's Stone

Survey number																								
Date of observation																								
Observation effort (in hrs)																								
Start time																								
End time																								
Confirmed burrow activity	A																							
	B																							
	C																							
	D																							
	E																							
	F																							
	G																							
	H																							
	I																							
NEW BURROW on 18/5/08	J																							
NEW BURROW on 22/5/09	K																							
NEW BURROW on 10/7/08	L																							
NEW BURROW on 10/7/08	M																							
NEW BURROW on 24/7/08	N																							
Key																								
	1	Observation made, number of Puffins					F					Feeding observed					C					Click observed		

Table 2. Summary of LFS Logbook observations. (Records in **bold** indicate sightings between 01 June and 14 June 2008)

<i>Date</i>	Number of Puffins	Location	Observation	Survey Section
08-Apr	1	St Philip's Stone	On water, rafting	F
22-Apr	4	St Philip's Stone	On water, rafting	F
23-Apr	1	Jenny's Cove	On water	E
23-Apr	2	St Philip's Stone	On land, burrows C & I	F
27-Apr	4	Jenny's Cove	On water, one pair billing, head-flicking & mating attempt	E
02-May	6	St Philip's Stone	On water	F
07-May	1	Jenny's Cove	On water	E
07-May	3	St Philip's Stone	On land, seen entering burrows C, E & H	F
07-May	3	St Philip's Stone	2 on water, 1 on land	F
08-May	1	Jenny's Cove	On water	E
08-May	2	St Philip's Stone	At burrow H	F
09-May	1	Jenny's Cove	On land between Devil's Chimney & Deep Zawn	E
09-May	7	St Philip's Stone		F
10-May	3	Jenny's Cove	On water	E
12-May	6	Jenny's Cove	On water	E
12-May	1	St Philip's Stone	On land	F
18-May	2	NW Point to NE Point	End of island right of North Light	H
19-May	5	Jenny's Cove	On land, 1 left of Devil's Chimney, 4 right of Devil's Chimney	E
30-May	3	St Philip's Stone	On land	F
01-Jun	3	South Light to Shutter Rock	On water below Rocket Pole	A
01-Jun	2	Shutter Rock	On water	A
01-Jun	6	St Philip's Stone	2 on water, 4 on land	F
04-Jun	6	South Light to Shutter Rock	On water, Benjamin's Chair area	A
04-Jun	6	Jenny's Cove	On water	E
04-Jun	1	NW Point to NE Point	Flew west past North Light	H
04-Jun	3	NE Point to Gannets' Rock	On water	I
06-Jun	3	South Light to Shutter Rock	On water, Benjamin's Chair area	A
07-Jun	3	South Light to Shutter Rock	On water off Rocket pole	A
07-Jun	4	South Light to Shutter Rock	On water off Rocket pole	A
09-Jun	5	Pilot's Quay		B
09-Jun	1	Battery	On water	D
09-Jun	6	Jenny's Cove	On water	E
10-Jun	3	South Light to Shutter Rock	On water south of Rocket Pole	A
10-Jun	1	Shutter Rock		A
10-Jun	3	Pilot's Quay	On water	B

10-Jun	4	Jenny's Cove	On land	E
10-Jun	8	St Philip's Stone	On land	F
10-Jun	3	North End		H
10-Jun	1	North of Gannets' Rock	On water	I
11-Jun	2	Jenny's Cove		E
11-Jun	2	Jenny's Cove	At burrow	E
11-Jun	5	St Philip's Stone		F
11-Jun	1	St Philip's Stone	At burrow	F
11-Jun	1	North End	On water	H
12-Jun	3	Gannets' Rock	On water	I
13-Jun	2	Jenny's Cove	On water	E
13-Jun	6	North of Gannets' Rock	On water	I
14-Jun	3	St Philip's Stone	1 at burrow, 2 on water	F
14-Jun	1	Devil's Slide	On water	G
14-Jun	3	North End	On water	H
14-Jun	10	Gannets' Rock	On water	I
15-Jun	1	St James's Stone	On water	G
16-Jun	6	St Philip's Stone		F
16-Jun	5	Gannets' Bay	On water	J
17-Jun	6	Jenny's Cove	5 on land, 1 in flight	E
17-Jun	8	St Philip's Stone		F
17-Jun	3	Mousehole & Trap	On water	J
18-Jun	1	Brazen Ward	On water	J
19-Jun	7	Jenny's Cove	Left of Devil's Chimney	E
19-Jun	6	St Philip's Stone		F
20-Jun	6	St Philip's Stone	At burrow A	F
23-Jun	1	St Mark's inlet	Seen on land at 8:30am, present for 15 mins	F
28-Jun	4	St Philip's Stone	At burrows	F
29-Jun	11	St Philip's Stone	8:29am	F
29-Jun	16	St Philip's Stone	1:30pm	F
30-Jun	3	Below Benjamin's Chair		A
02-Jul	10	Jenny's Cove		E
03-Jul	7	Jenny's Cove		E
26-Jul	2	Jenny's Cove	On water	E
28-Jul	6	Jenny's Cove	On water	E

Table 3. Puffin numbers recorded on and around Lundy in early June 1981-2008

Study Plot	1981 Census	1982 Census	1986 Census	1992 Census	1996 Census	2000 Census	2004 Census	2007 Logbook entries 1-14 June	2008 Logbook entries 1-14 June
A - South Light to Shutter Rock								2	6
B - Shutter Rock to Old Light									5
D - Battery Point to Needle Rock	34	18	8	1	1				1
E - Needle Rock to Pyramid	31	35	12	13		2			6
F - Pyramid to St James's Stone	8	3	10	7	1	5	5	7	8
G - St James's Stone to NW Point	47	20	7	10	13	5			1
H - NW Point to NE Point	5	6	2	5		1		3	3
I - NE Point to Gannets' Rock	4	5							10
J - Gannets' Rock to Brazen Ward				1					
L - Halfway Wall to South Light								2	
Totals	129	87	39	37	15	13	5	14	40