Seabird Report 2023

Ymddiriedolaeth Natur
De a Gorllewin Cymru
Wildlife Trust of
South & West Wales

A summary of the status of seabirds breeding on Skokholm in 2023.
The lower limits given here, taken from the Skokholm Island Management Plan, have been established by the Wildlife Trust of South and West Wales and endorsed by the Seabird Subgroup of the Islands Conservation Advisory Committee. A green box is an attribute above its lower limit, a red box an attribute below the lower limit stipulated in the plan.

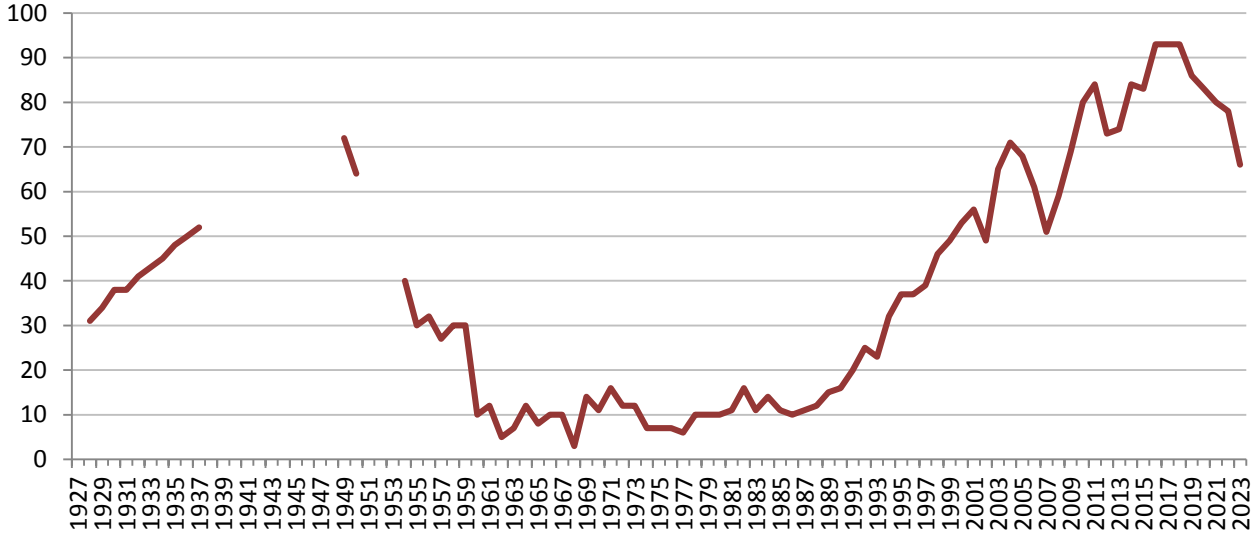
		Whole Island or Annual Plot Total (2022-2018 in parenthesis)	Productivity (2022-2018 in parenthesis)
Great Black-backed Gull		**Whole Island population:** not to drop below the 2018-2022 mean of 84	
Population	Productivity	**Productivity:** 3 in any 5 consecutive years with less than 1.10 chicks per breeding pair	
		66 nests (78, 80, 83, 86, 93)	1.05 (1.30, 1.51, 1.40, 1.43, 1.40)
Herring Gull		**Whole Island population:** not to drop below the 2018-2022 mean of 307	
Population	Productivity	**Productivity:** 3 in any 5 consecutive years with less than 0.70 chicks per breeding pair	
		309 nests (309, 305, 301, 301, 320)	0.78 (0.69, 0.84, 0.33, 0.69, 0.73)
Lesser Black-backed Gull		**Whole Island population:** 3 in any 5 consecutive years with less than 4600 pairs	
Population	Productivity	**Productivity:** 3 in any 5 consecutive years with less than 0.60 chicks per breeding pair	
		715 aia (833, 935, 880, 1028, 1069)	0.70 (0.53, 0.89, 0.12, 0.27, 0.63)
Guillemot		**Whole Island population:** not to drop below the 2018-2022 mean of 4930	
Population	Not set	**Productivity:** not monitored on Skokholm	
		4992 aol (5515, 5065, 5101, 4654, 4316)	- (0.55-0.61 in 2013)
Razorbill		**Whole Island population:** not to drop below the 2018-2022 mean of 3236	
Population	Productivity	**Productivity:** 3 in any 5 consecutive years with less than 0.80 chicks per breeding pair	
		3552 aol (3965, 3356, 3517, 2755, 2585)	0.55 (0.64, 0.47, 0.56, 0.63, 0.69)
Puffin		**Whole Island population:** not to drop below the 2018-2022 mean of 9320	
Population	Productivity	**Productivity:** 3 in any 5 consecutive years with less than 0.74 chicks per breeding pair	
		12,192 adults (10611, 11245, 8534, 7447, 8762)	0.79 (0.72, 0.80, 0.78, 0.76, 0.75)
Storm Petrel		**Study plot population:** any measurable decrease in the population	
Population	Not set	**Productivity:** limit not yet set due to a lack of data	
		92 transect responses (102, 86, No census, 89, 83)	0.80 (0.85, 0.80, 0.45, 0.74, 0.55)
Fulmar		**Whole Island population:** not to drop below the 2018-2022 mean of 214	
Population	Productivity	**Productivity:** 3 in any 5 consecutive years with less than 0.50 chicks per breeding pair	
		195 aos (224, 225, 207, 198, 217)	0.54 (0.52, 0.51, 0.51, 0.62, 0.49)
Manx Shearwater		**Study plot population:** any measurable decrease in the population	
Population	Productivity	**Productivity:** 3 in any 5 consecutive years with less than 0.69 chicks per breeding pair	
		521 sites in 8000m^2 (710, 670, 730, 655, 739)	0.68 (0.69, 0.79, 0.68, 0.72, 0.70)

Great Black-backed Gull *Larus marinus* **Gwylan Gefnddu Fwyaf**
Fairly Common Breeder and Common Visitor
21 trapped (including 15 pulli), 60 resighted, 2 controls
1936-1976: 231 trapped, 2012-2022: 535 trapped, 15 retrapped, 313 resighted, 8 controls

Although March roost counts otherwise peaked at 42 on the 6th and 26 on the 25th, a Bog roost of 18 on the morning of the 9th had become 71 by that evening, this the largest March roost of the last ten years; the 2014-2022 peak March roost mean is 34.8, with a high during this period of 48 in 2016 and 2017. Nevertheless, a peak March daycount of only 91 on the 9th was down on a 2013-2022 mean high of 106.1 and on that logged in seven of the previous ten years, with lower highs in recent years mirroring the declining breeding population. April roosts reached 45 on the 3rd, 51 on the 5th and 34 on the 30th, the peak the second largest roost in this month since 2017 (albeit down on a 2013-2022 mean of 65.2 and highs of 213 in 2013, 63 in 2015 and 58 in 2016 and 2017). However April daycounts followed the pattern seen in March, with a peak of 116 on the 6th being the second lowest April maximum of the last 12 years, down on a 2013-2022 mean high of 141.1. Nests were mapped between 28th April and 20th May, this revealing 66 apparently incubating birds (the only

nests not visited to confirm the presence of eggs were adjacent to the Bog Lesser Black-backed Gull colony and on offshore stacks); although the total was the 18th highest on record, it was 15.4% down on the 78 mapped last year, 22.1% down on a 2013-2022 mean of 84.7 ±sd 6.6 and well down on highs of 93 in 2016, 2017 and 2018. Indeed this was the largest drop in the Skokholm population since 2007 and made this the fifth year in succession in which the total number of breeding pairs has fallen below the lower limit stipulated in the Skokholm Management Plan. A drop in adult survival is seemingly, at least in part, to blame for this decline in the breeding population (see below).

The number of Great Black-backed Gull breeding pairs 1928-2023 (where data exists). Control of numbers started in 1949 (destruction of both nests and adults) and stopped in 1985.



A colour ringing project, begun nine years ago, is providing an insight into how adult return rates influence the number of breeding pairs. Of 23 adults wearing rings in 2014, 19 (82.6%) returned for the 2015 breeding season; the number of nesting pairs dropped from 84 in 2014 to 83 in 2015. There followed an apparent increase in adult survival, during which time the breeding population increased to, and then stabilised at, 93 pairs; of 21 adults wearing colour rings in 2015, 19 returned in 2016 (90.5%), whilst 32 of 33 returned in 2017 (97.0%) and 32 of 36 returned in 2018 (88.9%). Of 43 adults wearing rings in 2018, only 34 (79.1%) returned in 2019, the breeding population dropping by seven pairs during the same period, whilst 37 of 43 birds (86.1%) returned in 2020 (the nest count dropped by three), 29 of 37 (78.4%) returned in 2021 (the breeding population declined by a further

three pairs) and 25 of 29 (86.2%) returned last year (there were two fewer pairs). This year saw 27 of 33 adults return (81.8%), whilst there were 12 fewer breeding pairs; this suggests that approximately 28 established adults did not return to breed in 2023 and that only four new birds recruited in their place. Although what was apparently the largest drop in adult survival (logged in 2021) did not correspond with the biggest drop in breeding numbers, the population has only increased or remained stable with adult survival of 88.9% or better. One potential issue is that the ringing of adults on the nest could deter them from returning (thus making survival appear lower than it is in reality), however if we exclude the data collected in the year after ringing (when any disturbance should take effect), the return rates remain at a similar 89.5% in 2016, 100% in 2017, 90.6% in 2018, 74.2% in 2019, 81.8% in 2020, 78.4% in 2021, 86.2% in 2022 and 82.1% this year; it thus seems likely that disturbance during ringing is not responsible for a decline in return rates.

The 2018 and 2019 return rates were previously reported as being lower than listed above. However a chance close encounter with a metal only ringed bird in 2020 revealed it to be an adult colour ringed in 2014 (which lost its colour mark between the 2017 and 2018 seasons). A close inspection of birds occupying territories from which colour ringed individuals had previously gone missing revealed a further darvic loss, this from another 2014 ringed adult (which had lost its ring between the 2018 and 2019 breeding seasons). Additionally W:142, ringed as an adult in 2016, lost its colour ring between the 5th and 6th June 2020; the dropped ring was found in the Puffin study plot, allowing the loss to be attributed to snapping rather than glue failure. Although the rate of ring loss is seemingly low, it will perhaps increase as the rings age; a careful check for metal rings is thus important, although reading the inscribed digits demands good views and significant patience (at least two of the three adults which lost their plastic rings were breeding this year, their metal rings again being read (these do not form part of the adult survival statistics)). In an effort to better understand ring loss, an additional red ring was fitted above the metal ring on every bird ringed in 2022 and 2023; it is hoped that this ring will outlast the taller numbered darvic and thus draw attention to any birds with missing rings.

It is not clear what may have caused such seemingly high adult mortality since 2018, although interactions with the fishing industry, poisoning and the H5N1 strain of highly pathogenic avian influenza (HPAI) have previously been raised as areas for concern. Major leg injuries (including

missing feet and snapped bones) and punctured torsos have occurred, wounds seemingly too severe to have been caused by anything other than anthropogenic means. Aggressive encounters with other gulls and extreme weather events have previously resulted in broken wings and apparent internal injuries, whilst it seems likely that undamaged corpses are the result of toxins (including those produced by *Clostridium botulinum*). A full record of the injuries recorded in previous years can be found in the Skokholm Seabird Reports. The only injured Great Black-backed Gull encountered this year was an adult with a broken leg present to the south of Winter Pond on the 4th and 17th July, this perhaps the long dead adult found in a similar area on 29th November. Freshly dead adults were in Rat Bay on 28th May and near North Pond on 30th May, a long dead adult was near Wheatear Rock on 22nd June, a further fresh adult was along the south coast cliffs on 9th July and a dead adult and dead juvenile were together above the Anticline on 8th August. The North Pond bird was tested for HPAI but came back negative, an empty gastrointestinal tract suggesting that it had starved. The south coast bird tested positive for the H5N1 strain of HPAI, this the second positive case on the Island following a Black-headed Gull found on 21st May. Additionally a Skokholm ringed eighth-summer (W:108) found dead on Lundy Island, Devon, tested negative for HPAI in July, this bird found alongside two dead Herring Gull which tested positive for the disease. Unsurprisingly it has been proposed that gulls will prove a vector for HPAI transmission both between colonies and between seasons; it is hoped that colour ringing will highlight any significant drop in survival. This species was again regularly observed behind fishing vessels, although flocks were smaller than of late; there were peak counts of ten behind 'Emma Jane' on 9th May and ten behind 'Boy's Pride' on 2nd June. An important step in understanding the Skokholm population will be to discover if such anthropogenic food sources are regularly exploited; additional food will increase survival, particularly during the winter or periods of low seabird and Rabbit numbers, however foraging around boats or mainland food sources also has the potential to seriously impact health.

Checks of any accessible and seemingly complete nests from 5th April failed to find any eggs until the 14th when a search of the area to the south of Winter Pond located a nest with one egg; the other pairs in this area were either yet to build or were lingering near empty nests. The first two eggs of 2022 were found in a nest to the southwest of North Pond on the 11th, whilst the 2013-2022 first egg mean is 15th April (with the earliest found on the 10th in 2014 (a single egg) and 2018 (a clutch of three) and the latest on the 25th in 2013). The first three chicks to be seen in 2023 were above Blacksmith's Landing on 13th May, these the earliest of the last six years (with the latest during this period logged on the 20th in 2018). Of 37 monitored nests, 16 pairs failed, seven pairs fledged a singleton, ten pairs fledged two and four pairs fledged three. There were thus 39 young fledged, resulting in a productivity figure of 1.05 fledglings per monitored pair; productivity was the poorest

since the 0.93 of 2014, 19.2% down on that of 2022, 27.1% down on a 2013-2022 mean of 1.44 (±se 0.07) and 3.7% down on the 1989-2004 mean of 1.09. Poor productivity was due in part to failures as chicks approached fledging size; six dead near-fledglings were found on 7th July, with two of three at Gate Rock, two of three to the northwest of the Sugarloaf and both on the Tabernacle perishing, whilst a further brood of two were lost at South Pond on 21st July.

Productivity estimates 2002-2023 (average number of fledglings per monitored pair).

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1.09	0.91	-	0.76	1.07	1.02	1.02	-	0.71	0.89	-
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
1.80	0.93	1.66	1.38	1.54	1.40	1.43	1.40	1.51	1.30	1.05

The Great Black-backed Gulls are spectacular apex predators and an exciting component of the Skokholm seabird assemblage, however it is important we monitor the impact of higher breeding numbers on the Manx Shearwater population. Dead shearwaters were counted for a tenth consecutive year, the vast majority of which had been eaten by Great Black-backed Gulls (see the Manx Shearwater section for further details); a total of 2615 corpses, comprising 1859 adults and 756 youngsters, were marked this year. The number of adults marked was the second lowest of the last ten years, down on a record 3008 logged in 2020 and 20.7% down on a 2014-2022 mean of 2343.7 ±sd 451.8. The number of youngsters marked was also the second lowest to date, 31.8% down on a 2014-2022 mean of 1108.6 ±sd 224.1 (a high of 1398 was recorded in 2016 and a low of 728 last year). The total number of marked corpses was the lowest to date, 24.3% down on a 2014-2022 mean of 3452.2 ±sd 554.5. There are many factors influencing the number of corpses found; observer effort has been rather consistent, but possible or certain differences between years have included the number of Great Black-backed Gulls present (which may include differences in the number of shearwater specialists (Westerberg *et al*., 2018)), the number of shearwaters available (including differences in the number of prospecting individuals likely to spend longer on the surface), the prevalence of suitable hunting conditions (governed primarily by the moon cycle and weather), the size of the Rabbit population (which may provide an alternative food source) and the prevalence of puffinosis (which may make young birds easier to catch). Although the number of dead birds currently being found represents a relatively small proportion of the Skokholm shearwater population, there is clearly a benefit to understanding these relationships in greater detail. Ad hoc observations again suggested that shearwaters were regularly being dug out from their burrows this year (as opposed to being taken from the entrance or from above ground), indeed birds in five of 166 active study burrows were seemingly accessed via an excavated hole; this form of hunting has

the potential to impact more than just the eaten individual, as it reduces the suitability of nest sites and the stability of the colony. Over 500 burrows have been repaired during the last decade, with stones used to cover the void (below photographs).

The percentage of Great Black-backed Gulls colour ringed as fledglings to be encountered in each subsequent year. The mean is that for the period prior to 2022.

Ringed in	2014	2015	2016	2017	2018	2019	2020	2021	2022	Mean
% not seen again	25.58	46.15	53.13	63.89	39.47	20.45	46.15	51.43	70.00	**43.28**
% seen again	74.42	53.85	46.88	36.11	60.53	79.55	53.85	48.57	30.00	**56.72**
% seen 1+ year	48.84	36.54	31.25	27.78	42.11	40.91	43.59	28.57	15.00	**37.45**
% seen 2+ years	37.21	30.77	18.75	22.22	42.11	34.09	38.46	17.14		**30.09**
% seen 3+ years	32.56	26.92	18.75	22.22	39.47	31.82	28.21			**28.56**
% seen 4+ years	30.23	25.00	15.63	19.44	28.95	20.45				**23.28**
% seen 5+ years	18.60	19.23	15.63	13.89	13.16					**16.10**
% seen 6+ years	16.28	13.46	15.63	5.56						**12.73**
% seen 7+ years	13.95	13.46	12.50							**13.31**
% seen 8+ years	9.30	9.62								**9.46**
% seen 9+ years	4.65									**4.65**
% found dead	9.30	3.85	9.38	2.78	7.89	6.82	2.56	5.71	5.00	**6.04**

The colour ringing project initiated in 2014 is also providing information on juvenile survival and recruitment. Of 43 fledglings ringed in 2014, 32 (74.4%) have been resighted subsequently, including

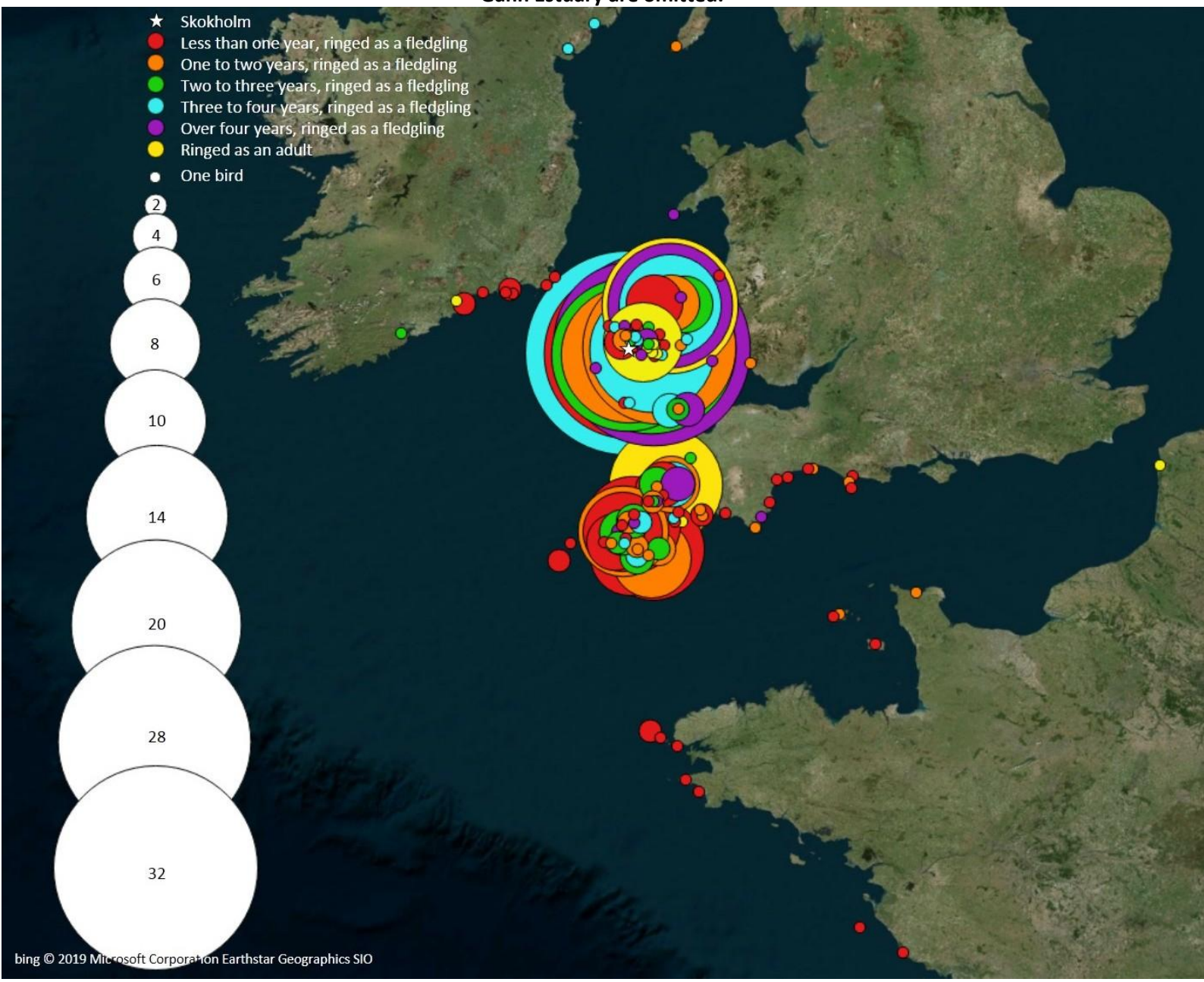
four which have been found dead. At least 21 birds (48.8%) definitely survived their first full year, 16 (37.2%) survived two years, 14 (32.6%) survived three years, 13 (30.2%) survived four years, eight (18.6%) survived five years, seven (16.3%) survived six years, six (14.0%) survived seven years, four (9.3%) survived eight years and two (4.7%) have survived nine years. The birds ringed as fledglings in 2015 have provided similar results (see table above). Although these figures do not give an exact measure of juvenile survival, the birds ringed longer ago (of which more have returned to Skokholm and for which there has been longer for them to be encountered on the mainland), suggest that at least 25% of fledglings are surviving to four years of age. Two ringed as fledglings in 2015 and one ringed at the same age in 2017 bred on Skokholm for a second straight year, whilst one ringed as a fledgling in 2016 bred for the first time. Two 2014 ringed fledglings were found breeding on Skomer in 2020, although only one has been reported in each subsequent year, whilst a 2015 ringed bird bred there for the first time this year and a 2016 ringed bird which bred there last year was seen this September (although there were no breeding season reports). Only time will tell whether this study provides a sound estimate of recruitment to the breeding population, something which may well be dependent on how many establish territories on Skokholm or Skomer (where they should be seen) as opposed to other less studied breeding sites. Of 64 youngsters which have so far returned to Skokholm at some point, 14 were first back as first-summers, nine as second-summers, 24 as third-summers, 13 as fourth-summers, three as fifth-summers and one as a sixth-summer; it would appear that birds are most likely to first return in their third summer, with 8.45% of all youngsters ringed between 2014 and 2020 having first returned to the Island at this age (10.92% returned at this age, this including birds first back in earlier years).

Although resightings away from Skokholm will be somewhat biased by a preponderance of birders at the main roost sites in Cornwall, it seems likely that the typical southerly movements observed in young Great Black-backed Gulls reflect their genuine post-fledging distribution (see map below). Birds gravitate back towards Pembrokeshire as they get closer to breeding age (see both the table and map below). In addition to those sightings listed below, there were eight individuals ringed as breeding adults and found 7.5km away on the Gann Estuary (birds captured on their Skokholm nests between 2014 and 2023). The ages given in the following table are known for birds ringed as near-fledglings, whereas 'adult' denotes a bird ringed at a minimum of four years which is thus of unknown age. All of these records were received since a similar table was published in the 2022 Seabird Report.

Darvic	Ring	Location	County/COUNTRY	Age	Date
W:004	MA37971	Camel Estuary	Cornwall	Fourth-winter	01/02/23
W:064	HT94925	Skomer Island	Pembrokeshire	Ninth-summer	15/04/23
W:064	HT94925	Gann Estuary	Pembrokeshire	Tenth-winter	18/10/23
W:077	HT94934	Skokholm	Pembrokeshire	Tenth-winter	03/08/23, 07/10/23
W:108	HT94971	Skokholm	Pembrokeshire	Eighth-summer	06/04/23, 01/05/23
W:108	HT94971	Lundy Island	Devon	Eighth-summer	01/07/23 (dead)
W:114	HT94943	Skomer Island	Pembrokeshire	Eighth-summer	12/06/23 (breeding)
W:119	HT94979	Skokholm	Pembrokeshire	Eighth-summer	06/04/23, 27/08/23
W:121	HT94981	Skokholm	Pembrokeshire	Eighth-summer	22/07/23 (breeding)
W:124	HT94955	Gann Estuary	Pembrokeshire	Eighth-winter	24/03/23
W:124	HT94955	Skokholm	Pembrokeshire	Eighth-summer	05/08/23 (breeding)
W:145	HT95000	Dale Airfield	Pembrokeshire	Adult	09/09/23
W:154	MA37811	Skokholm	Pembrokeshire	Seventh-summer	14/06/23
W:162	MA37820	Skomer Island	Pembrokeshire	Seventh-summer	03/09/23, 07/09/23
W:162	MA37820	Gann Estuary	Pembrokeshire	Eighth-winter	26/10/23
W:168	MA37826	Gann Estuary	Pembrokeshire	Seventh-summer	30/04/23
W:168	MA37826	Skokholm	Pembrokeshire	Seventh-summer	08/08/23, 12/09/23

W:179	MA37838	Skokholm	Pembrokeshire	Seventh-summer	20/05/23 (breeding)
W:192	MA37859	Gann Estuary	Pembrokeshire	Sixth-winter	04/03/23
W:195	MA37862	Skokholm	Pembrokeshire	Sixth-summer	16/09/23 (breeding)
W:195	MA37862	Gann Estuary	Pembrokeshire	Seventh-winter	27/10/23
W:195	MA37862	Skokholm	Pembrokeshire	Seventh-winter	29/10/23

The movements of Skokholm ringed Great Black-backed Gulls 2014-2023. The different colours represent the different ages at which the birds were resighted. 58 birds ringed as fledglings and resighted on Skokholm over four years later and 54 birds ringed as adults and resighted on the Gann Estuary are omitted.



Darvic	Ring	Location	County/COUNTRY	Age	Date
W:217	MA37882	Gann Estuary	Pembrokeshire	Sixth-winter	04/01/23
W:217	MA37882	Skokholm	Pembrokeshire	Sixth-summer	18/04/23
W:217	MA37882	Skomer Island	Pembrokeshire	Sixth-summer	04/09/23
W:219	MA37884	Skokholm	Pembrokeshire	Sixth-winter	04/03/23

W:230	MA37844	Camel Estuary	Cornwall	Adult	28/10/23, 20/11/23
W:233	MA37846	Camel Estuary	Cornwall	Adult	03/12/23
W:246	MA37915	Skokholm	Pembrokeshire	Fifth-summer	16/09/23
W:259	MA37904	Skokholm	Pembrokeshire	Fifth-summer	28/04/23
W:260	MA37905	Rhossili Bay, Gower	Glamorgan	Fifth-summer	16/07/23 (dead)
W:261	MA37906	Gann Estuary	Pembrokeshire	Fifth-winter	06/01/23
W:271	MA37928	Skokholm	Pembrokeshire	Fifth-summer	20/04/23, 24/05/23
W:274	MA37931	Gann Estuary	Pembrokeshire	Fifth-summer	17/09/23
W:295	MA37963	Skokholm	Pembrokeshire	Fourth-summer	29/04/23
W:295	MA37963	Lundy Island	Devon	Fourth-summer	13/07/23
W:296	MA37964	Skokholm	Pembrokeshire	Fourth-summer	06/04/23, 16/09/23
W:296	MA37964	Gann Estuary	Pembrokeshire	Fourth-summer	17/09/23
W:298	MA37967	Skokholm	Pembrokeshire	Fourth-summer	01/05/23
W:298	MA37967	Camel Estuary	Cornwall	Fifth-winter	04/12/23
W:304	MA37979	Lundy Island	Devon	Fourth-summer	23/07/23
W:307	MA37982	Skokholm	Pembrokeshire	Fourth-summer	22/04/23, 29/04/23
W:315	MA37989	Gann Estuary	Pembrokeshire	Fourth-winter	04/03/23
W:315	MA37989	Skokholm	Pembrokeshire	Fourth-summer	13/05/23
W:315	MA37989	Dale Airfield	Pembrokeshire	Fourth-summer	09/09/23
W:318	MA37992	Gann Estuary	Pembrokeshire	Fourth-summer	17/09/23
W:320	MA37994	Skokholm	Pembrokeshire	Fourth-summer	06/05/23
W:320	MA37994	Skomer Island	Pembrokeshire	Fourth-summer	07/09/23
W:322	MA37996	Skokholm	Pembrokeshire	Fourth-summer	05/03/23, 14/05/23
W:325	MA37999	Skokholm	Pembrokeshire	Fourth-summer	30/04/23
W:331	MA46912	Frainslake Beach	Pembrokeshire	Third-summer	24/06/23
W:331	MA46912	Skokholm	Pembrokeshire	Third-summer	24/05/23, 05/09/23
W:332	MA46913	Skokholm	Pembrokeshire	Third-summer	22/04/23, 17/09/23
W:335	MA46916	Gann Estuary	Pembrokeshire	Third-winter	03/03/23
W:339	MA46920	Gann Estuary	Pembrokeshire	Fourth-winter	27/10/23
W:343	MA46924	Skokholm	Pembrokeshire	Third-summer	03/05/23
W:345	MA46926	Skokholm	Pembrokeshire	Third-summer	01/05/23, 13/05/23
W:346	MA46927	Lundy Island	Devon	Third-summer	18/07/23
W:346	MA46927	Camel Estuary	Cornwall	Fourth-winter	19/10/23
W:347	MA46928	Newlyn Harbour	Cornwall	Third-winter	07/01/23
W:348	MA46929	Gann Estuary	Pembrokeshire	Third-winter	01/03/23
W:349	MA46930	Skokholm	Pembrokeshire	Third-summer	18/04/23, 16/09/23
W:349	MA46930	Gann Estuary	Pembrokeshire	Fourth-winter	26/10/23
W:352	MA46936	Gann Estuary	Pembrokeshire	Third-summer	06/01/23, 25/04/23
W:353	MA46937	Skokholm	Pembrokeshire	Third-summer	27/04/23
W:353	MA46937	Lundy Island	Devon	Third-summer	07/07/23, 17/07/23
W:358	MA46942	Gann Estuary	Pembrokeshire	Third-winter	08/01/23
W:358	MA46942	Skokholm	Pembrokeshire	Third-summer	16/09/23
W:361	MA46946	Gann Estuary	Pembrokeshire	Third-summer	22/04/23
W:361	MA46946	Skokholm	Pembrokeshire	Third-summer	20/05/23
W:365	MA46949	Skokholm	Pembrokeshire	Third-summer	20/05/23
W:365	MA46949	Lundy Island	Devon	Third-summer	12/07/23, 17/07/23
W:370	MA46956	Ramsey Island	Pembrokeshire	Second-winter	30/03/23
W:374	MA46961	Gann Estuary	Pembrokeshire	Third-winter	26/10/23
W:376	MA46963	Lundy Island	Devon	Second-summer	05/07/23, 23/07/23
W:379	MA46966	Hayle Estuary	Cornwall	Second-winter	22/02/23

W:379	MA46966	Gann Estuary	Pembrokeshire	Third-winter	27/10/23
W:384	MA46971	Hayle Estuary	Cornwall	Second-winter	22/02/23
W:384	MA46971	Skokholm	Pembrokeshire	Second-winter	13/03/23
W:390	MA46979	Lundy Island	Devon	Second-summer	05/07/23, 14/07/23
W:390	MA46979	Camel Estuary	Cornwall	Third-winter	19/12/23
W:391	MA46980	Gann Estuary	Pembrokeshire	Second-summer	30/04/23
W:391	MA46980	Skokholm	Pembrokeshire	Second-summer	01/05/23
W:391	MA46980	Carrigaline, Cork	IRELAND	Second-summer	13/07/23
W:416	MA55408	Kentraugh	Isle of Man	First-summer	31/08/23
W:419	MA55411	Slade Harbour, Wexford	IRELAND	First-winter	09/01/23
W:419	MA55411	Ballynagaul Pier, Waterford	IRELAND	First-winter	12/02/23
W:419	MA55411	Skomer Island	Pembrokeshire	First-summer	06/09/23
W:419	MA55411	Dale Airfield	Pembrokeshire	First-summer	16/09/23
W:422	MA55414	Lundy Island	Devon	First-summer	07/07/23
W:422	MA55414	Camel Estuary	Cornwall	Second-winter	31/12/23
W:428	MA55421	Dale Airfield	Pembrokeshire	Adult	16/09/23
W:440	MA55433	Dale Airfield	Pembrokeshire	Juvenile	28/08/23

Breeding season roosts again formed regularly in the Bog, although these were smaller than those of last year when numbers peaked at between 48 and 54 on three dates; there were ten roosts of 25 or more between 15th April and 15th June this year, with numbers peaking at 34 on four dates and 35 on 30th May (there were 21 roosts of 25 or more during the same period last year, with just two in 2021 and 11 in 2020). The first flying fledgling was to the west of Crab Bay on 4th July, this five days later than the first of last year and one day later than the 2014-2022 mean (the earliest during this period were recorded on 29th June last year and the latest on 11th July 2021). The largest July roosts were of only 23 on the 5th and 22 on the 8th and there were few communal roosts in August, with highs from the Neck of 39 on the 13th and 66 on the 18th; the latter was close to a 2022 August high of 68 and down on a 2021 peak of 86. Although 33 were anting on North Plain on the 2nd and daycounts peaked at 106 on the 17th, the largest September roosts were down on those of recent years; highs of 40 on North Plain on the 4th, 35 in the Bog on the 16th and 40 on North Plain on the 28th were down on peaks of 95 in 2022, 48 in 2021, 130 in 2020, 113 in 2019, 135 in 2018, 183 in 2017, 193 in 2016, 179 in 2015, 52 in 2014 and 355 in 2013. Numbers were also low in October, indeed the 25th became only the second October day this decade with no Great Black-backed Gull sighting at all; an October bird-days total of 571, although up on the 379 of last year, was otherwise the lowest this decade and was well down on a 2013-2022 mean of 1281.8 (there was a high of 3113 in 2013 when daycounts peaked at 264, this well up on October 2023 daycount highs of 41 on the 3rd and 43 on the 14th). November counts were also up on those of last year, with ten daycounts of more than ten including highs of 42 on the 1st and 29 on the 14th (three daycounts of more than ten last November peaked at 17), however a bird-days total of 314 was the second lowest of the last five Novembers (staff were present throughout in all five years). Counts during the first three days of December peaked at three on the 3rd (one of which was eating a Razorbill). The first fledgling to be seen away from the Island was on Dale Airfield on 28th August, however it proved the second year since the colour ringing project began in which a youngster was not seen in southwest England before the end of the year (the mean 2014-2021 first southwest resighting date is 29th September, with one at Newquay Harbour, Cornwall on 10th August 2019 the earliest and different birds at Gothian Sands and Newlyn Harbour (both Cornwall) on 5th December 2021 the latest).

Ringing recovery HT95457 (orange darvic with black M64:M)
Originally ringed as a chick, CALF OF MAN, ISLE OF MAN 18th July 2019
Previously recovered as a first-winter, SKOMER ISLAND, PEMBROKESHIRE 13th October 2019
Previously recovered as a first-winter, DUNGARVAN BAY, WATERFORD, IRELAND 17th February 2020

Previously recovered as a second-winter, FORLORN POINT, WEXFORD, IRELAND 3rd December 2020
Previously recovered as a third-winter, HELVICK HEAD, WATERFORD, IRELAND 26th February 2022
Recovered as a fourth-summer, NORTH POND, SKOKHOLM 14th May 2023
Finding condition Colour ring read in field
Distance travelled 263km at 188 degrees (S)
Days since ringed 1396

Ringing recovery MA55556 (red darvic with white S42:D)
Originally ringed as a chick, LAMBAY ISLAND EAST, DUBLIN, IRELAND 22nd June 2021
Previously recovered as a first-winter, PORT ORIEL, LOUTH, IRELAND 17th September 2021
Previously recovered as a second-winter, COVERACK, CORNWALL 15th January 2023
Recovered as a third-winter, NORTH PLAIN, SKOKHOLM 16th September 2023
Subsequently recovered as a third-winter, GANN ESTUARY, PEMBROKESHIRE 17th September 2023
Subsequently recovered as a third-winter, PORT ISAAC, CORNWALL 25th October 2023
Finding condition Colour ring read in field
Distance travelled 205km at 166 degrees (SSE)
Days since ringed 816

Herring Gull *Larus argentatus* **Gwylan y Penwaig**
Common Breeder Abundant Breeder in the 1970s
5 trapped (including 3 pulli), 42 resighted, 1 control
1934-1976: 13,265 trapped, 2013-2022: 178 trapped, 31 retrapped, 95 resighted, 1 control

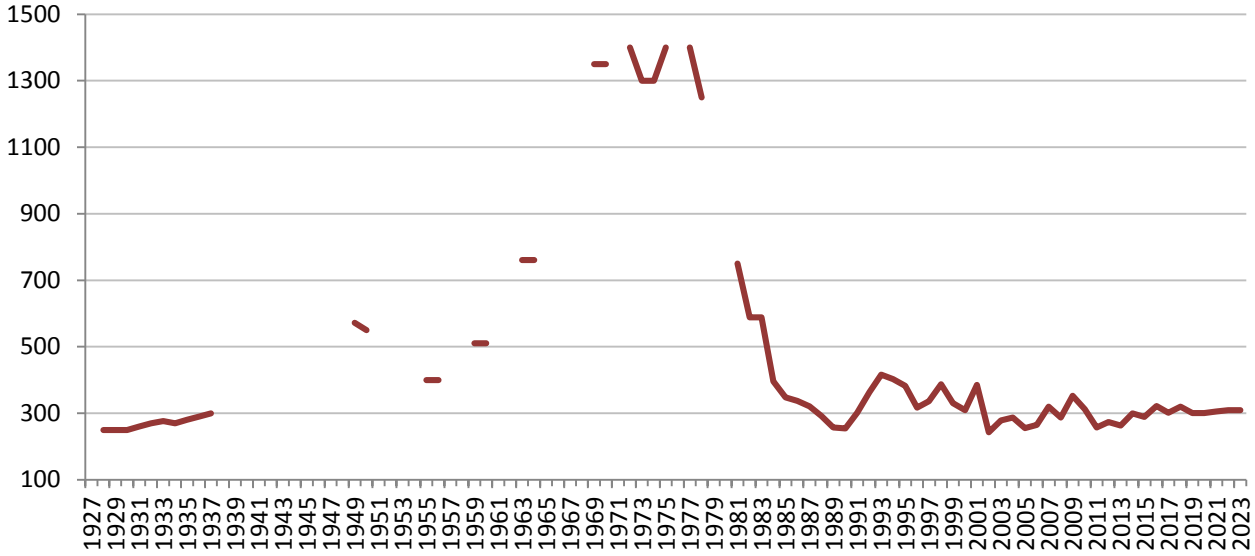
March daycounts again fluctuated widely, with 80 or less logged on ten dates, including lows of 41 on the 2nd, 28 on the 5th and 31 on the 8th when birds fed and roosted away from Skokholm, but highs of 246 on the 12th, 308 on the 17th and 282 on the 18th when many were back on territory. March roosts again included a good number of young birds, for example a North Pond roost of 48 on the 17th included 30 obvious subadults and a Neck roost of 97 on the 18th included at least 73 subadults (there were 12 younger birds in Crab Bay at the same time, a total of 85 close to the 81 logged on 3rd April); counts of subadults again contrasted with observations made of Lesser Black-backed Gulls during the same period. April checks of seemingly complete nests failed to find an egg until the 18th when one was in Purple Cove (neighbouring nests were all empty or still under construction); this was one day later than the first lone egg of last year (found in Peter's Bay), but matched the 2013-2022 first egg mean (see table below). Whole Island counts between the 13th and 16th May located 303 active nests, whilst an additional six were present on the east side of the Stack on 7th June; a total of 309 nests matched that recorded last year, this 2.6% up on the 2013-2022

mean (301.2 ±sd 16.6) but 1.8% down on the 1984-2022 mean (314.8 ±sd 44.9). This was the second year in five in which the total has risen above the lower limit set in the Skokholm Management Plan. The number of breeding pairs has apparently stabilised at a level close to that seen in the 1930s (the 1928-1937 mean was 269.7 ±sd 17.5), counts well down on the artificial peak of the 1970s.

When in April the first egg was located in each year 2013-2023, along with the 2013-2022 mean.

2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	Mean
18th	14th	25th	17th	18th	19th	18th	22nd	15th	17th	18th	**18th April**

The number of breeding pairs 1928-2023 (where data exists). The 1970s peak was attributed to the exploitation of local fish waste and the decline to botulism (Thompson, 2007).



The number of breeding pairs and productivity estimates (average number of fledglings per sample pair) 2009-2023.

2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
353	312	257	274	263	300	289	322	302	320	301	301	305	309	309
-	0.82	0.67	1.15	0.72	0.70	0.66	0.86	0.70	0.73	0.69	0.33	0.84	0.69	0.78

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

in 2017. There were 13 adults colour ringed in 2017 (all trapped on the nest), 17 in 2018 (11 on the nest and six in the Gull Trap), ten in 2019 (nine on the nest and one in a Spring Trap), four in 2021 (all in the Gull Trap) and 36 in 2022 (one on the nest and 35 in the Gull Trap); a COVID-19 dictated staffing shortage meant that there were no adults trapped in 2020. Each bird is ringed with a red darvic inscribed W:9** or W:8** in white, the latter two digits identifying the individual. Birds trapped away from the nest are only included in the adult survival sample in years after they have been found at a nest; 26 of the 46 trapped in this way were found at a nest prior to this season and 11 of the 2021/2022 birds were found this year (and will be included in the 2024 estimate). Of the 13 birds marked in 2017, 11 bred in 2018 (84.6%). Of 26 with rings in 2018, 17 (65.4%) were still alive during the 2019 breeding season, four of these Gull Trap birds (100% survival) and 13 nest trapped birds (59.1%); two of the nest trapped birds were only seen elsewhere and were seemingly not breeding, whilst two had changed nest site (one moved 370m and one moved 837m). Of 27 with rings in 2019, 20 (74.1%) were alive in 2020, five of these Gull Trap birds (100%) and 15 nest trapped birds (68.2%); six of the nest trapped birds and two of the Gull Trap birds were not seen at a nest. All 21 with rings in 2020 were alive in 2021; five nest trapped birds and one Gull Trap bird were not found breeding (three were only seen on the mainland and two were not seen at all). Of the 22 alive in 2021, 20 (90.9%) were alive in 2022, seven of these Gull Trap birds (100%) and 13 nest trapped birds (86.7%); six of these were not seen at a nest, including two only seen on the mainland and two not seen until 2023. Of the 40 alive in 2022, 30 (75.0%) were logged this year, 20 of these Gull Trap birds (76.9%) and ten nest trapped birds (71.4%); three of these were not seen at a nest, including one only seen on the mainland. Only one adult was colour ringed this year, this taken in the Gull Trap and tracked to Hump Head (from where it went on to fledge three young).

For a sixth successive year, the only colour ring resightings away from Skokholm came from mainland Pembrokeshire.

Darvic	Ring	Location	County	Age	Date
W:988	GR77159	Gann Estuary	Pembrokeshire	Adult	02/11/23
W:978	GV22428	Gann Estuary	Pembrokeshire	Adult	07/01/23, 30/04/23, 15/12/23
W:977	GV83149	Gann Estuary	Pembrokeshire	Adult	03/03/23
W:974	GV22432	Johnston	Pembrokeshire	Adult	04/06/23, 07/07/23
W:971	GV22440	Gann Estuary	Pembrokeshire	Adult	03/03/23
W:966	GV83062	Gann Estuary	Pembrokeshire	Adult	09/01/23
W:958	GY02321	Gann Estuary	Pembrokeshire	Adult	07/01/23, 26/10/23, 27/10/23
W:953	GV83151	Gann Estuary	Pembrokeshire	Adult	24/03/23
W:950	GV83136	Gann Estuary	Pembrokeshire	Adult	24/02/23
W:897	GR87920	Gann Estuary	Pembrokeshire	Adult	03/03/23, 18/03/23, 30/04/23
W:897	GR87920	Dale	Pembrokeshire	Adult	05/07/23
W:887	GY02329	Gann Estuary	Pembrokeshire	Adult	03/03/23
W:886	GY02330	Gann Estuary	Pembrokeshire	Adult	03/03/23
W:885	GY02331	Gann Estuary	Pembrokeshire	Adult	03/03/23, 04/03/23, 10/03/23
W:883	GY02334	Gann Estuary	Pembrokeshire	Adult	10/03/23, 06/04/23
W:877	GY02339	Gann Estuary	Pembrokeshire	Adult	04/01/23
W:876	GY02366	Gann Estuary	Pembrokeshire	Adult	12/01/23
W:875	GY02369	Gann Estuary	Pembrokeshire	Adult	06/01/23
W:873	GY02365	Gann Estuary	Pembrokeshire	Adult	07/01/23, 23/03/23

There were no colour ringed birds found dead this year, the post-2017 total remaining at five. Six unringed dead adults were recorded this year, all of which were seemingly uninjured; one was to the southeast of North Pond on 1st March, one was along the south coast on 6th May, one was in Twinlet and one in South Haven on 15th June, one was to the south of Winter Pond on 4th July and one was in Crab Bay on 12th July (none were sent for HPAI testing). Additionally a bird with a broken, bloody leg

near North Pond on 4th May was not seen again. There were nine dead adults found on the Island in 2022 and three in both 2021 and 2020, this year's tally thus suggesting that the H5N1 strain of highly pathogenic avian influenza did not have a serious impact this breeding season. Injured Herring Gull are encountered most years (broken limbs and puncture wounds are most common, see previous Skokholm Seabird Reports); it would seem likely that interactions with fishing gear are responsible for some of these injuries, unsurprisingly so given how this species searches around boats for food (additionally a dead bird found in 2021 was strangled by fishing line). Following four impacted birds in 2019, no incidences of oiling have been recorded for four years.

The first chick was alongside two eggs on 16th May, this in the Purple Cove nest where eggs were first seen; this was on the same date as the first chicks of last year and one day earlier than the 2017-2022 mean. The first flying fledgling was near the Top Tank on 2nd July, this five days earlier than the first of last year and two days earlier than the 2013-2022 mean; the latest first fledgling noted during this period was aloft on 10th July in 2015, the earliest on 30th June in 2016 and 2021. Checks of the Neck productivity plot during July, where 139 pairs had established nests (five more than last year), located a maximum of 109 fledging-sized young (along with five smaller chicks, none of which were thought to have gone on to fledge). The resulting 2023 productivity figure of 0.78 fledged young per pair was 13.0% up on both the 0.69 of last year and the 2013-2022 mean (0.69 ±sd 0.15); there was a high during this period of 0.86 in 2016 and a low of 0.33 in 2020, with the remaining years all seeing productivity of between 0.66 and 0.84 fledglings per pair. Disappointing 2020 productivity was linked to a period of rough May weather which resulted in low nests being destroyed by unseasonable 11 metre waves. Large seas also destroyed nests last year, the resulting productivity estimate matching the third lowest of the last decade. However the weather in May 2022 was even more unusual, with southwesterly winds gusting at up to 69mph and the Mid Channel Rock Lighthouse Beacon off St Ann's Head registering an average wave height of 11 metres and multiple waves of at least 16 metres; nevertheless overall productivity was 0.84, with the pairs not impacted by the storm doing particularly well. It remains to be seen if the more regular spring storms predicted by current climate change models will impact numbers or encourage birds to nest elsewhere.

August saw the customary post-breeding departure of both adults and fledglings, although a mean daycount of 94.0 was the third highest of the last decade and up on a 2013-2022 mean of 79.3; although there were lows of 35 on the 17th, 37 on the 19th and 12 on the 31st, there were highs of 280 on the 3rd (including 158 roosting ashore and 42 juveniles together off the Neck), 152 on the 4th

and 316 on the 16th (including 210 feeding off South Haven). As is typically the case, fewer Herring Gulls visited Skokholm in September, indeed there were fewer than in nine of the last ten years; there were 22 single-figure daycounts and none noted on the 30th, with 31 on the 1st, 220 on the 2nd (122 of which were anting on North Plain) and 38 on the 6th (32 of which were on North Plain) the only daycounts of more than 21. October counts were more typical of the last decade; although no Herring Gull were seen at all on two dates and there were a further 12 dates with single-figure daycounts, highs of 75 on the 21st, 94 on the 29th and 73 on the 31st led to a bird-days total of 854, this down on a 2013-2022 October mean of 963.7 (there were higher totals in six of these years, with a peak of 2014 in 2015). Numbers again increased in November, with birds returning to their breeding territories and the Neck becoming a regular roost site once more; although only four were logged on the last day of the month and there were 14 daycounts of between 31 and 89, six counts of 250 or more included highs of 305 on the 3rd (298 of which were in the Neck roost), 320 on the 5th (290 in the Neck roost) and 340 on the 6th (320 in the Neck roost). A November bird-days total of 3847 was 40% up on a 2013-2022 mean of 2747.4 (there were highs of 4531 in 2015, 4454 in 2016 and 4287 in 2020), although the peak daycount only matched a mean of 339.8 (there were daycount highs of 585 in 2015, 588 in 2016 and 612 in 2017, the majority of which were feeding with the smaller gulls in Broad Sound). Very few were present in early December, indeed there were only 19 on the 1st, six on the 2nd and four on the 3rd; this was quite a contrast to 2021 when large Broad Sound feeding flocks led to record daycounts of 465 on the 1st, 838 on the 2nd and 425 on the 3rd.

Ringing recovery GV04160
Originally ringed as a chick, CALDEY ISLAND, PEMBROKESHIRE 13th June 2014
Recovered as an adult, THE NECK, SKOKHOLM 6th May and 15th June 2023
Finding condition Metal ring read in field
Distance travelled 39km at 279 degrees (W)
Days since ringed 3249 and 3289

Lesser Black-backed Gull *Larus fuscus* **Gwylan Gefnddu Leiaf**
Common Breeder previously a Very Abundant Breeder
18 trapped (including 12 pulli), 2 retrapped, 5 resighted, 2 controls
1938-1976: 11,912 trapped, 2013-2022: 671 trapped, 32 retrapped, 114 resighted, 19 controls

A mean March daycount of 466.1 was up on the 419.9 of last year, but otherwise the lowest this decade, down on a 2013-2022 mean of 585.4 and a high during that period of 827.0 in 2014 (the

three lowest mean March daycounts have occurred in the last three years). The number of birds within the colonies again fluctuated considerably during the day; for example the Middle Heath colony contained 112 birds on the morning of 12th March but only two that afternoon, whilst the Frank's Point colony contained 55 birds on the morning of 14th April but 112 in the evening and 40 on the morning of the 19th but 112 again in the evening. The larger communal roosts recorded in previous years were again generally absent; the majority of early season counts were of birds on territory, with the largest roosts forming in the Bog and North Pond where there were highs of 86 on the 6th and 69 on 13th March. A more detailed description of how the gulls prepare for the breeding season was available in 2015 and 2016 due to the GPS trackers fitted by the British Trust for Ornithology in 2014 (funded by the Department of Energy and Climate Change) which gave some idea as to when birds first returned to Skokholm (see the relevant Skokholm Seabird Reports for details of return dates and the range of over-wintering strategies used); the last of the functioning trackers and the base station were removed in 2017. A daycount of 577 on the 25th was the lowest April maximum of the last 12 years, down on a 2013-2022 mean high of 1221.7; there were highs of 2109 in 2014 and 1703 in 2016, whilst the five lowest peaks have occurred in the last five years (including previous lows of 759 in 2019 and 750 last year). April nest checks at Purple Cove, Middle Heath, Green Heath and the Neck located two eggs at the former site on the 23rd (in the same nest); these were one day earlier than the first two of last year and four days earlier than the 2013-2022 mean, indeed they were the earliest of the last 11 years.

When the first egg was located in each year 2013-2023, along with the 2013-2022 first egg mean.

2013	2014	2015	2016	2017	2018
3rd May	24th April	4th May	25th April	1st May	26th April
2019	**2020**	**2021**	**2022**	**2023**	**Mean**
28th April	25th April	24th April	24th April	23rd April	**27th April**

Vantage point counts of the inland breeding subcolonies and a full census of the coast nesting pairs were made between the 13th and 18th May, during which 643 apparently incubating adults were located; this was the lowest count in over 50 years, a total down on the 750 of 2022 and 37.2% down on the 2014-2022 mean (1023.7 ±sd 253.9). In an effort to reduce disturbance in the colony, the Islands Conservation Advisory Committee has suggested that the walkthrough surveys, which have traditionally been used to check the accuracy of the point counts, are no longer performed annually; there was thus no walkthrough for a fourth year (the lack of a walkthrough in 2020 was due to a COVID-19 dictated lack of personnel). The number of apparently incubating adults (as assessed using the vantage point counts) and the number of nests containing eggs (as located during

walkthrough surveys) invariably differ, primarily due to incubating birds being hidden by vegetation (particularly in areas where there are no raised vantage points). Between 2013 and 2019 there were on average 12.83% more nests containing eggs than apparently incubating adults (although this was as low as 0.82% in a year with a particularly short breeding season sward height and as high as 27.32% when vegetation was taller (see table below)). The walkthrough surveys also reveal a variable number of empty nests; 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)), although between 2013 and 2019 this dropped to between 4.98% and 17.62% (with a mean of 14.03%). It is unclear whether empty nests are second nests made by the pairs present, nests robbed of eggs or nests where adults are yet to lay. The breeding season is certainly a protracted one, with the first three 2023 chicks located on 24th May (the 2013-2022 mean is 24th May, with one on the 18th in 2021 the earliest and one on 6th June 2015 the latest), but a nest near the Top Tank containing recently hatched young on 2nd July, the latter four days before the first flying fledglings were recorded at Purple Cove (the 2016-2022 first fledgling mean is 5th July, with the earliest on 30th June 2020). It would thus seem likely that some (but given their extremely close proximity to each other, not all), empty nests belong to additional pairs. Between 2013 and 2019 the total number of nests (including empty nests) was between 20.68% and 43.45% higher than the vantage point total (with a mean of 31.36%, see table below).

A comparison of vantage point counts (of apparently incubating adults) and the number of nests (both empty and with eggs) located during walkthrough surveys of the same areas. The difference each year provided a correction factor to predict the number of nests (both empty and with eggs) which were actually present. The 2013-2019 means may be useful in years when walkthrough surveys are not possible/desirable.

Year	Vantage point count	Walk through count	Empty/ With egg(s)		Percentage of empty nests	Difference between counts (%)*	Correction (no empty nests)	Difference between counts (%)**	Correction (including empty nests)
2019	194aia	251	39	212	15.54	9.28	1.09	29.38	1.29
2018	266aia	321	16	305	4.98	14.66	1.15	20.68	1.21
2017	366aia	517	51	466	9.86	27.32	1.27	41.26	1.41
2016	550aia	789	139	650	17.62	18.18	1.18	43.45	1.43
2015	493aia	636	110	526	17.30	6.69	1.07	29.01	1.29
2014	613aia	827	135	692	16.32	12.89	1.13	34.91	1.35
2013	245aia	296	49	247	16.55	0.82	1.01	20.82	1.21
Mean					**14.03**	**12.83**	**1.13**	**31.36**	**1.31**

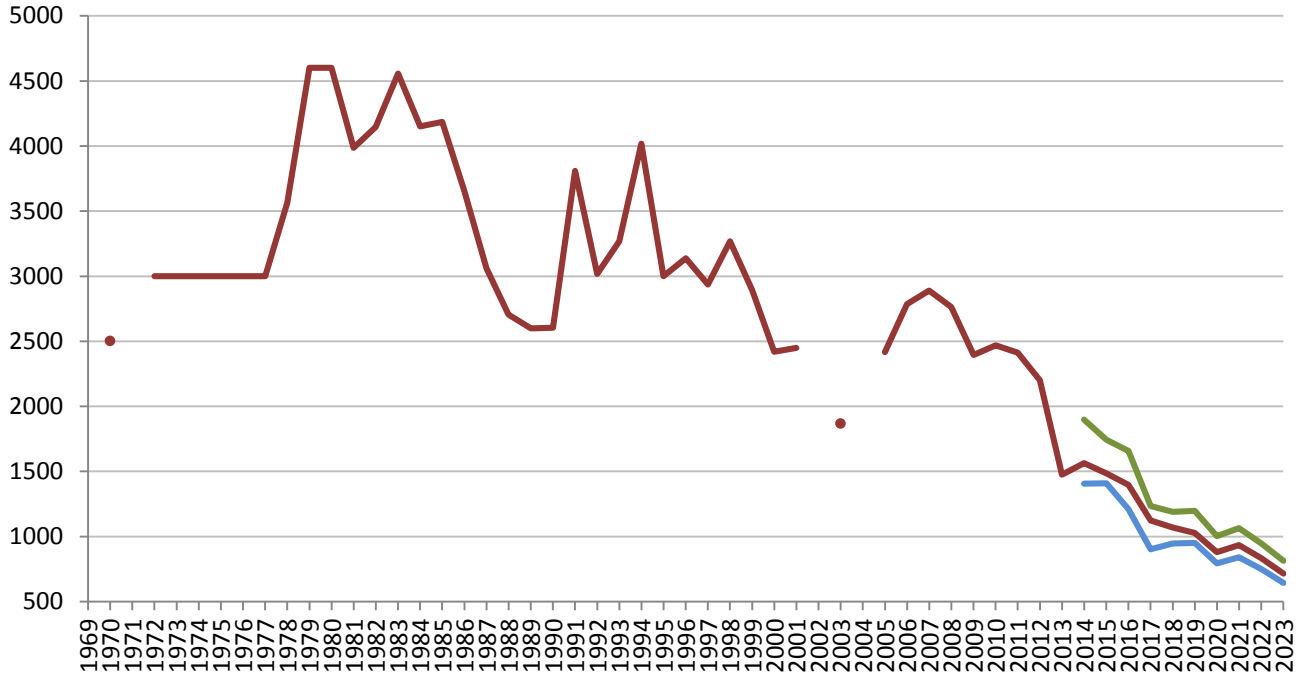
* How many more nests (containing eggs) were present than the number of apparently incubating birds seen (as a percentage).

** How many more nests (including empty nests) were present than the number of apparently incubating birds seen (as a percentage).

Of the 643 apparently incubating adults counted this year, 92 were in open (primarily coastal) areas where it was apparent that additional pairs were not present. A mean 2013-2019 correction factor of 1.13 (see table above) would suggest that the remaining 551 apparently incubating birds actually represented a total of 623 nests with eggs (giving a 2023 breeding population estimate of 715); this is the lowest estimate of the post-War era, 14.2% down on the previous low of 833 recorded in 2022 and 37.6% down on the 2014-2022 mean (1146.2 ±sd 271.1). A mean 2013-2019 correction factor of 1.31 would suggest that the remaining 551 apparently incubating birds actually represented a total of 722 nests (including empty nests); this gives a 2023 breeding population estimate of 814, a total 38.6% down on the equivalent 2014-2022 mean (1326.3 ±sd 348.4) and only the second such post-War estimate of less than four-figures (following the 947 of last year). The actual number of breeding pairs probably lies somewhere between these two estimates (715-814). It was again clear

during the vantage point surveys that the vegetation was taller and thicker than usual this year; it is thus possible that the estimate of inland pairs (using the 2013-2019 mean correction factor) will be lower than what was actually present. However, even if we use a 2017 correction factor of 1.27 (that generated in a year with similar thick vegetation), the 2023 whole Island estimate would only be 792 (which is still down on the 833 predicted using the mean correction factor last year).

The total number of Lesser Black-backed Gull breeding pairs 1970-2023. Control measures started in 1984 (destruction of nests) and stopped in 1998. The green line is the population estimate if all empty nests are assumed to belong to additional pairs. The maroon line is the corrected population estimate based on a comparison of vantage point counts and the number of nests which contained eggs. The blue line is the uncorrected vantage point count total (of apparently incubating adults). A lack of walkthrough surveys means that the corrected 2020-2023 totals are based on the 2013-2019 means.



Lesser Black-backed Gull productivity is typically assessed by entering various subcolonies to ring as many near-fledglings as possible, the BTO rings becoming marks for a mark/resighting population estimate. However it has lately proven difficult to resight sufficient ringed fledglings to allow for a meaningful evaluation. In an attempt to increase the number of resightings, recent years have seen staff and volunteers re-enter the subcolonies (rather than observing fledglings at a distance with a

telescope (above photograph)). A simple calculation, '(number ringed on first visit x number checked for rings on second visit) / number of birds found to have rings on second visit', predicts the number of near-fledglings within an area (which can then be compared with the number of pairs thought to have been present). Whereas the walkthrough surveys allowed for an accurate assessment of how many nests were in an area, a lack of walkthroughs from 2020 onwards means that productivity estimates are less accurate (as they are based on corrected vantage point counts); given that the vegetation was again dense this year, productivity at the inland site may have been lower than that given below (as there may have been more pairs present than predicted using the mean correction). Visits to the Middle Heath and Green Rocks area during early July suggested that 40 near-fledglings had been produced by 59 pairs (the uncorrected vantage point count for this area was 52 pairs); the resulting productivity figure of 0.68 fledglings per pair was the third highest inland estimate of the last 11 years. The coastal slopes of Purple Cove were investigated for a seventh year as this discreet subcolony, with very short sward or rocky substrate, is seemingly suitable for an accurate fledgling count using only a telescope; here 43 pairs produced a minimum of 31 fledglings, giving a productivity figure of 0.72 fledglings per pair (the 2017-2022 Purple Cove mean is 0.84 ±se 0.12, with a high of 1.21 in 2018 and a low of 0.54 in 2022). Purple Cove productivity has proven to be higher than that observed inland in each of the last seven years (albeit only marginally so in the last three years), this fitting ad hoc observations and perhaps supporting the theory that birds in larger, denser subcolonies are struggling in part due to the intraspecific depredation of small chicks.

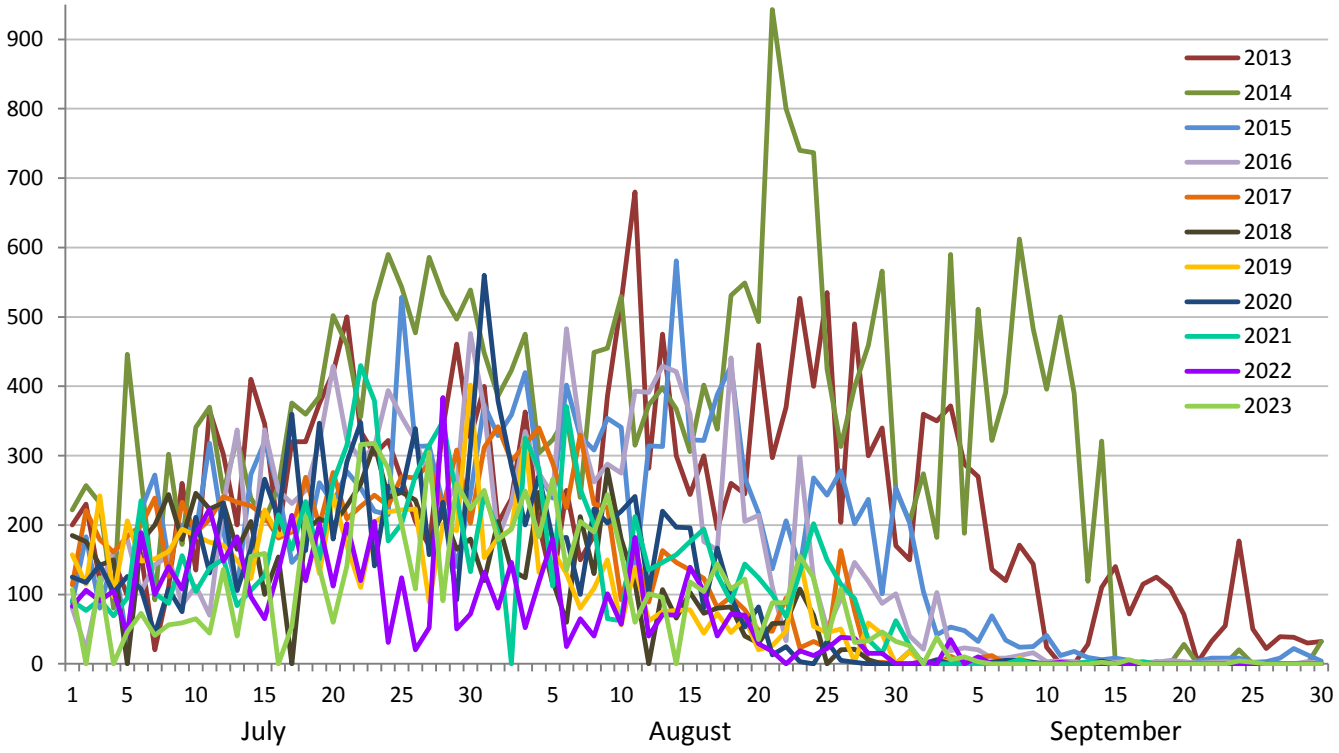
Combining data from Purple Cove and Middle Heath suggests that 102 pairs fledged 71 young; a combined productivity figure of 0.70 is the second highest estimate of the last decade, this 89.2% up on the 2013-2022 mean of 0.37 ±se 0.08 (there was a high during this period of 0.89 in 2021 and a low of 0.12 in 2020). It is unclear why productivity was above average this year. Ad hoc observations broadly mirrored the estimate; although fledglings across North Pond and North Plain could potentially have come from anywhere on Skokholm (and possibly elsewhere), a maximum of 93 on 24th July was the second highest count of the last six years (only down on the 136 present in 2021 when productivity was thought to be higher than in any other year this decade). Although it should be remembered that the breeding population has fallen considerably during the same period, the 2014-2022 mean maximum is 102.8, with a high of 141 in 2014.

Lesser Black-backed Gull productivity estimates 2008-2023 (where data exists).

2008	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
0.27	0.03	0.16	0.16	0.30	0.15	0.23	0.38	0.63	0.27	0.12	0.89	0.53	0.70

Although poor productivity is seemingly driving the decline in the Skokholm breeding population, it also seems possible that disease may be taking its toll in some years. There were ten dead adults encountered this year, six of which were found dead with no indication as to what had happened; birds were found at Crab Bay on 7th March, in the Bog on 1st May, in Peter's Bay on 17th June, at North Pond on 26th June and on North Plain on 21st July and 3rd August. Additionally a third-summer at the Top Tank had a bloody head injury on 29th April, an adult at the Cutting with a bloody broken wing on 3rd May walked to Frank's Point and was at Spy Rock between the 6th and 9th (it was not found dead), an adult with a broken wing at North Pond on the morning of 7th June was dead that afternoon, an adult on the Neck with a broken wing on 13th June had reached the Well by the 15th and was dead on the 16th, a bloody adult missing both feet along North Pond Wall on 20th June was dead the following day, a first-summer at North Pond on 20th June had a broken wing (it was not seen again), a second-summer along the south coast had a broken leg on 20th June, an adult with a broken wing on Home Meadow on 6th July was later found dead and an adult on North Plain had two broken legs on 19th July. There were nine non-juveniles found dead last year (including one shot using an air gun), 14 adults in 2021 (along with one which had recently lost a leg), 11 adults in 2020 (including an uncoordinated bird (with a clean vent) found dead two days later, but not including two live birds with broken wings, one with a broken leg and one missing a foot), two adults in 2019, 15 adults in 2018 (including a bird with a particularly dirty vent and a bird handed in live from a passing boat), three dead adults in 2017 and 21 dead adults in 2016 (which were thought to be diseased or poisoned, with the period before death characterised by very lethargic behaviour, fine shaking and an eventual loss of limb control (similar symptoms were seen in 2018 and 2021)). Although it is possible that aggressive interactions with other birds may have caused some deaths (indeed one body was inverted in much the same way as that of a Manx Shearwater), amputations likely result from human interaction (probably with the fishing industry), whilst disease or poisoning seem likely in many cases where intact bodies are found (HPAI was not suspected).

The number of Lesser Black-backed Gulls roosting on North Plain and in the vicinity of North Pond 2013-2023.



As is typically the case, the number of birds using traditional roost sites increased during July; 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 at South Pond and on the Neck. This year saw the July roost peak at 318 on the 23rd; this was the third lowest July peak this decade, down on a 2013-2022 mean of 449.5 and a high during that period of 590 in 2014. A cumulative July total of 4064 roosting birds was 23 more than last year's tally but otherwise the lowest of the last 11 years and well down on highs of 8353 in 2013 and 11,226 in 2014. Whereas roost counts between 2013 and 2017 peaked in August, the last six years have seen a more rapid departure of birds from the Island. This year saw an August peak of 266 on the 5th, this up on an August 2022 high of 182 but otherwise the lowest maximum of the last 11 years (the 2013-2022 mean high is 456.5, with a peak of 943 in 2014). An August total of 3660 roosting birds was also up on last year, but down on a 2013-2022 mean of 5959.2 (between 2013 and 2015 the August total ranged between 8903 and 13,849, there were 7306 in 2016 and no more than 4364 since). The last three-figure roost count of the year was the 108 present on 26th August; this was ten days later than the last such count of 2022 and on the same date as the last of 2021 (between 2013 and 2016 the last three-figure roost counts were logged in September). September again proved to be quiet, with only 71 roosting birds noted during the month; although up on totals of between eight and 50 logged in each year between 2017 and 2022, the September roost total was in three-figures in 2015 and 2016, whilst in 2013 and 2014 it was in four (with a high of 5359 in 2014). A flightless juvenile with a drooped wing was present to the north of the Pedestal on 11th September, this individual regularly guarded and fed by both aggressive parents until 8th October when it was seen in flight (having presumably recovered from a wing strain or fracture); none of the three birds were knowingly encountered thereafter. These lingering birds, along with daycount highs of 17 on the 2nd and 13 on the 12th and 15th, contributed to an October bird-days total of 104, this the highest October tally since the 166 of 2016 (there was a 21st century high of 658 in 2013). November also proved more productive than of late, with sightings on all but three dates and highs of 19 on the 7th (18 on North Pond), 54 at North Pond on the 20th and 20 there on the 23rd and 26th; a November bird-days total of 255, although down on the 277 of 2020, was otherwise the highest this century and up on a 2013-2022 mean of 156.7 (this was the tenth year this century in which staff were present throughout the month). Two adults on the 1st was the only December sighting prior to a staff departure on the 3rd.

Ringing recovery Left leg white darvic with black N:M3M, Right tibia 6009695
Originally ringed as an adult male, R.S.U. LOS RUICES DUMP, MALAGA, SPAIN 22nd October 2022
Recovered as an adult, SPY ROCK, SKOKHOLM 21st and 22nd April and 1st May 2023
Finding condition Darvic ring read in field
Distance travelled 1664km at 353 degrees (N)
Days since ringed 181, 182 and 191

Ringing recovery Left leg green darvic with black 3NF, Right leg FH07803
Originally ringed as a juvenile, FLAT HOLM ISLAND, CARDIFF 2nd July 2006
Previously recovered as a juvenile, GLOUCESTER LANDFILL, GLOUCESTERSHIRE 17th July 2006
Previously recovered as an adult, GLOUCESTER LANDFILL, GLOUCESTERSHIRE 30th June 2010
Previously recovered as an adult, QUARTEIRA, FARO, PORTUGAL 6th and 8th October 2010
Previously recovered as an adult, FIGUEIRA DA FOZ, COIMBRA, PORTUGAL 10th November 2011
Previously recovered as an adult, EAST BOG, SKOKHOLM 31st July 2022
Recovered as an adult, EAST BOG, SKOKHOLM 17th March and 22nd, 23rd and 27th April 2023
Finding condition Darvic ring read in field
Distance travelled 154km at 283 degrees (WNW)
Days since ringed 6102, 6138, 6139 and 6143
Given that this individual has now been seen five times in under two years, it would seem likely that it has recently switched nest site to an area closer to the Skokholm path network.

Ringing recovery GV83171
Originally ringed as a chick, SKOKHOLM 9th July 2021

Recovered as a second-winter, TORREIRA, AVEIRO, PORTUGAL 23rd February 2023
Finding condition Unidentified gull found freshly dead
Distance travelled 1241km at 193 degrees (SSW)
Days since ringed 594

The birds previously carrying GPS tags, 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. Although the number of encounters logged each year is unsurprisingly declining, the darvic rings have yielded a fantastic number of field resightings; the 73 ringed birds have produced 184 separate resightings of 38 different individuals away from Skokholm. The table below summarises resightings received since similar tables were published in the 2014-2022 Seabird Reports. As has been shown by the British Trust for Ornithology GPS tracking project on Skokholm, 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 reflected in the colour ringing data, with 19 birds having been resighted at the same location in more than one winter. Records of returning birds have come from several sites in Portugal and Spain, along with two in France, one in the Channel Islands and one in Morocco. This year saw 9J:W in Malaga Harbour for at least a fifth winter (it was there 2017-2018, 2018-2019, 2019-2020 and 2020-2021), but also at a new site in Cadiz (it was seen in Barbate Harbour, 51km to the south of Cadiz, in the winters of 2014-2015, 2015-2016, 2016-2017, 2020-2021 and 2022-2023). Five different individuals were seen on Skokholm this year.

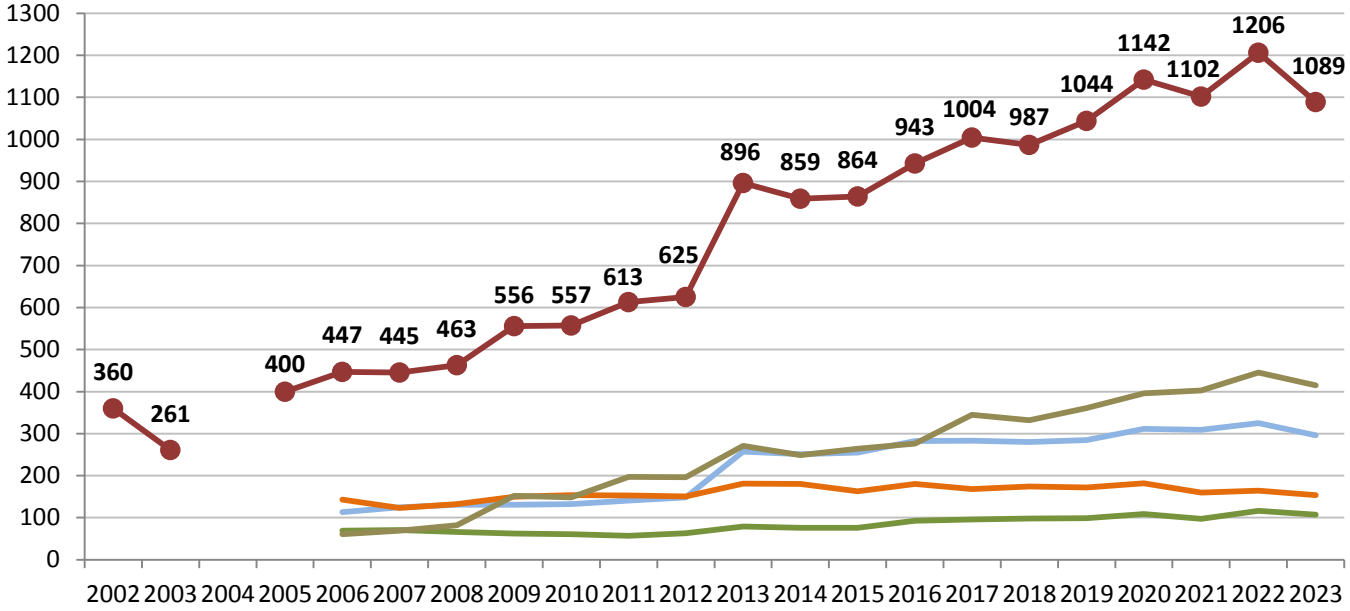
Darvic	Ring	Location	Country	Date
9J:W	GR98265	Malaga Harbour	Spain	07/01/23
9J:W	GR98265	La Caleta, Cadiz	Spain	28/11/23

Guillemot *Uria aalge* **Gwylog**
Very Abundant Breeder Common during the period 1928-1996, numbers then increasing rapidly
2 controls
1936-1976: 1021 trapped, 2014-2022: 7 pulli trapped, 25 controls

The mean March daycount was 511.2, this less than half the all-time high of 1159.6 recorded last year and down on a 2013-2022 mean of 610.1; there were 16 dates without a sighting (ten last year) and a further five dates when between two and five were encountered (five last year), but highs of 2973 on the 5th, 2341 on the 17th and 3087 on the 18th (the 2022 March daycount high was a record 4306, whilst the 2013-2022 mean is 2993.9). Customary departures for the sea continued in April, with 20 dates when counts of less than 600 were logged (including two dates without a sighting and 12 dates with between one and 19 birds present); there were 16 similar mass April departures last year, nine during an unprecedentedly early 2019 breeding season and an average of 15.1 between 2013 and 2022 (with highs of 25 in 2013 and 20 in 2014). A minimum of 3610 on the 23rd was the third highest April peak to date, a tally down on the 3971 of 2020 and the 3725 of 2021. The first egg to be found was at Middlerock on 1st May, this on the same date as the 2013-2022 first egg mean; the first 2019 egg (which was believed to be the earliest yet recorded in Wales (Birkhead, *pers*. *comm*.)) was found on 18th April and was perhaps the result of unusually high sea surface temperatures (Burton, M., 2019), however the only other earlier eggs during this period were found on the 29th in 2017 and on the 27th in 2020, 2021 and 2022 (the latest egg during this period, found on 15th May 2014, followed a winter of prolonged storms and significant auk wrecks). Early eggs are likely to be at risk during spring storms, as was the case on the night of 26th April 2019 when Storm Hannah encouraged the majority of auks back to sea (leaving those incubating birds which managed to protect their early eggs from the storm more exposed to predators). Exceptional 16 metre seas during the 20th and 21st May 2021 led to the loss of many eggs from the more exposed ledges, an unseasonable disruption which probably altered the number of adults present on at least some

areas of cliff during the 2021 survey period. May weather was more clement in 2022, although an eight metre sea on the night of 17th May, which destroyed both Razorbill and Herring Gull eggs, may have impacted Guillemots. No major weather events were recorded this breeding season.

The total number of adult Guillemot in all six study plots 2002-2023 (as an average from ten visits) and the totals from the four largest plots since 2006 (as an average from ten visits).



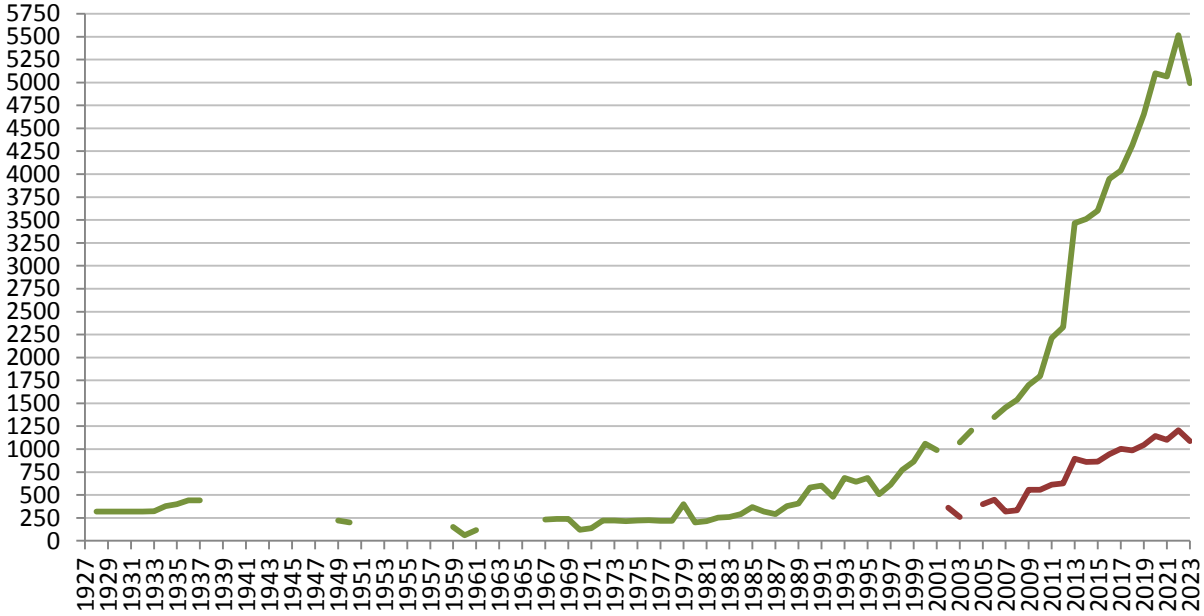
The whole Island totals (adults on ledges suitable for breeding), mean plot totals, the range of totals over ten study plot visits, the standard deviation observed over the ten visits and the percentage of the Island total made up of study plot birds 2014-2023.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Island	3512	3603	3949	4038	4316	4654	5101	5065	5515	4992
Plots	859	864	943	1004	987	1044	1142	1102	1206	1089
Range	797-947	756-939	887-1003	939-1144	937-1060	982-1140	1069-1213	1012-1209	1144-1318	1035-1150
±SD	54.25	58.30	40.25	57.45	37.38	54.40	50.57	68.55	55.19	39.88
Plot %	24.5	24.0	23.9	24.9	22.9	22.4	22.4	21.8	21.9	21.8

The six study plots were counted on ten dates between 29th May and 9th June. The mean total from all plots was 1089 adults on ledges; this was 9.7% down on that recorded last year, but 8.4% up on the 2013-2022 mean (1004.7 ±sd 119.0) and the fourth highest total yet recorded. The mean declined in all six plots, with the largest drop at Middlerock where an average of 37 adults on ledges was 28.8% down on the 52 of last year and the lowest mean yet recorded (down on the 43 of 2007). A 23.1% decline was seen on the slope to Purple Cove, where the mean dropped from 104 to 80, the latter the fourth highest total yet recorded (there were 85 in 2020 and 2021). A Little Bay mean of 296 was also the fourth highest to date, down on the 311 of 2020, the 309 of 2021 and 8.9% down on the 325 of last year. A Steep Bay mean of 107 was the third highest, down on the 109 of 2020 and 7.8% down on the 116 of last year. Although a North Gully mean of 415 was 6.7% down on the 445 of last year, it was the second highest to date. The smallest drop was seen on Guillemot Cliff where a mean of 154 was 6.1% down on the 164 of last year; nevertheless the mean was the lowest since 2012, down on a 2013-2022 mean of 172.4 and a high during that period of 182 in 2020. Previous reports have suggested that this drop in the number of birds using Guillemot Cliff, along with the decline seen on Middlerock, may be due in part to an increase in Fulmar numbers; although the number of Fulmar pairs in these Twinlet plots dropped by two this year, there were still 67% more pairs nesting than in 2013, the petrels perhaps excluding auks from previously occupied areas and halting any further expansion of auks along their current ledges. Although Fulmar-free ledges

apparently suitable for colonisation by cliff nesting auks are present within the study plot boundaries, these new areas were not utilised this year. The only other plot which contains Fulmar is at Little Bay, however numbers here have declined from a high of 19 in 2013 to only 12 in 2023, this no doubt reducing any impact on the auks. The remaining three plots did not contain Fulmar this year. The Twinlet counts will again have been impacted by a pair of Crows which nested in Steep Bay; this pair specialised in taking the eggs and young of Guillemots, with one Crow grabbing an auk until they tumbled towards the sea, this allowing the second bird to snatch unattended ledge contents. Despite the potential impacts of Fulmars and Crows, it would seem certain that the 9.7% drop in the number of plot Guillemots was driven by other factors.

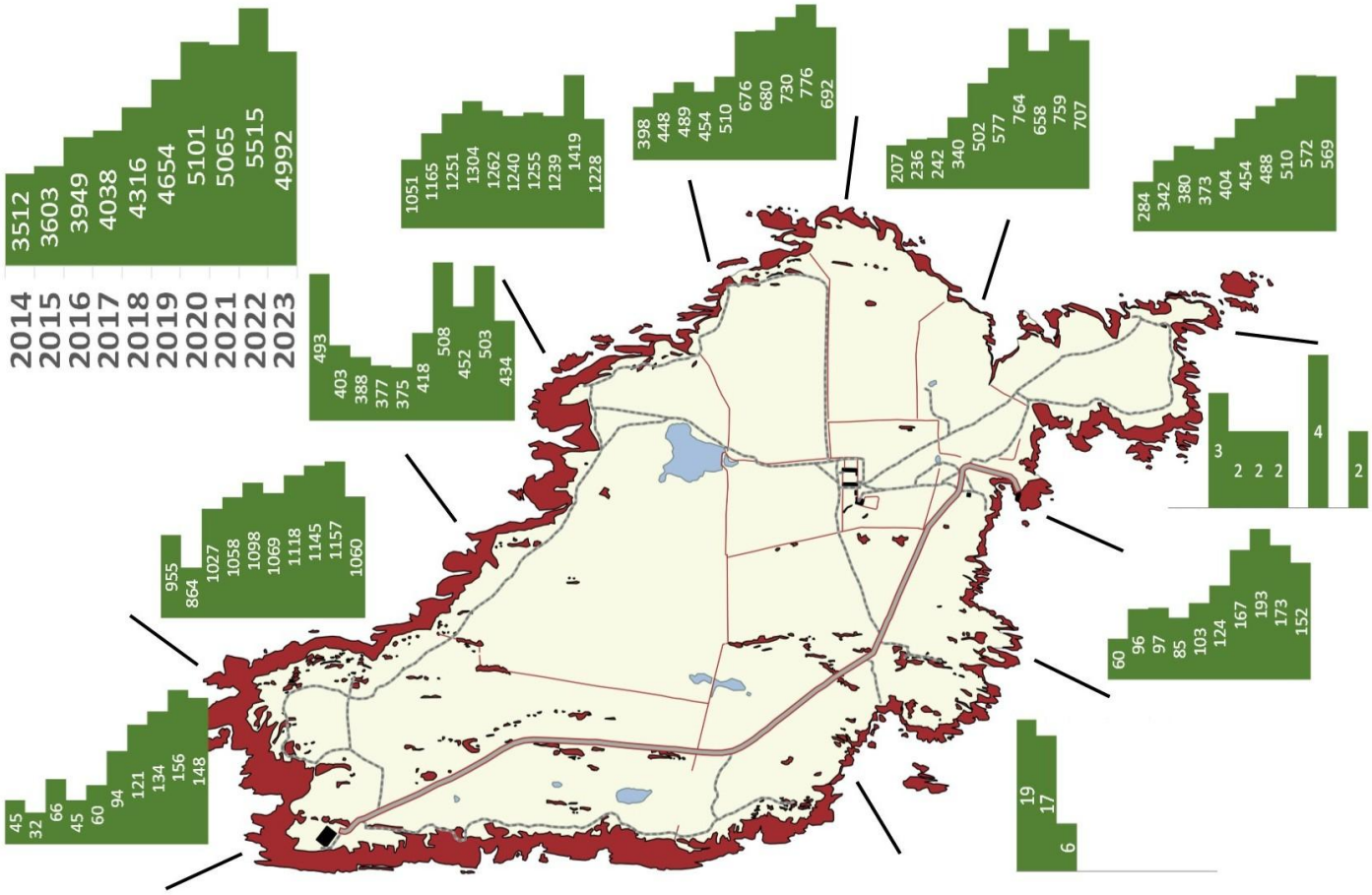
The total number of Guillemots (adults on ledges suitable for breeding) recorded on Skokholm since 1928 and the number of birds within the study plots since 2002.



Whole Island counts were made from the land between the 1st and 11th June and calm seas allowed for a boat-based survey on 7th June. 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; they have not always been available, with 2012 the last year in which there was not at least one boat survey. A mean total of 4992 adults in suitable breeding habitat was

9.5% down on the 2022 count but the fourth highest tally yet recorded on Skokholm (also down on the 5101 of 2020 and the 5065 of 2021). The proportion of the whole Island total made up of study plot birds (21.8%) matched that of 2021 and almost matched the 21.9% of last year, but was down on the 2006-2022 mean of 25.3% and matched the fourth lowest on record. This was only the second time since 2001 in which the mean whole Island total has declined, the drop the largest since the 25.6% decline observed between 1995 and 1996 (and the largest numerical decline to date, with drops of 200 birds between 1979 and 1980 and of 175 birds between 1995 and 1996 the previous highs). It is tempting to attribute the decline to avian influenza, although it would seem that the drop in numbers occurred prior to, rather than during, the 2023 breeding season; the plots at Twinlet and North Gully were again counted on nearly every day of the season (see chart below), with the mean May total for 2023 (510.23 adults on ledges) being 12.2% down on a 2022 mean of 581.33 (this greater than the 9.7% decline seen during the plot count period (see above)). Nevertheless a dead adult was in the North Gully plot from 3rd July, this an unusual sight on Skokholm; it was not accessible for HPAI testing (see below for the post-breeding impact of HPAI).

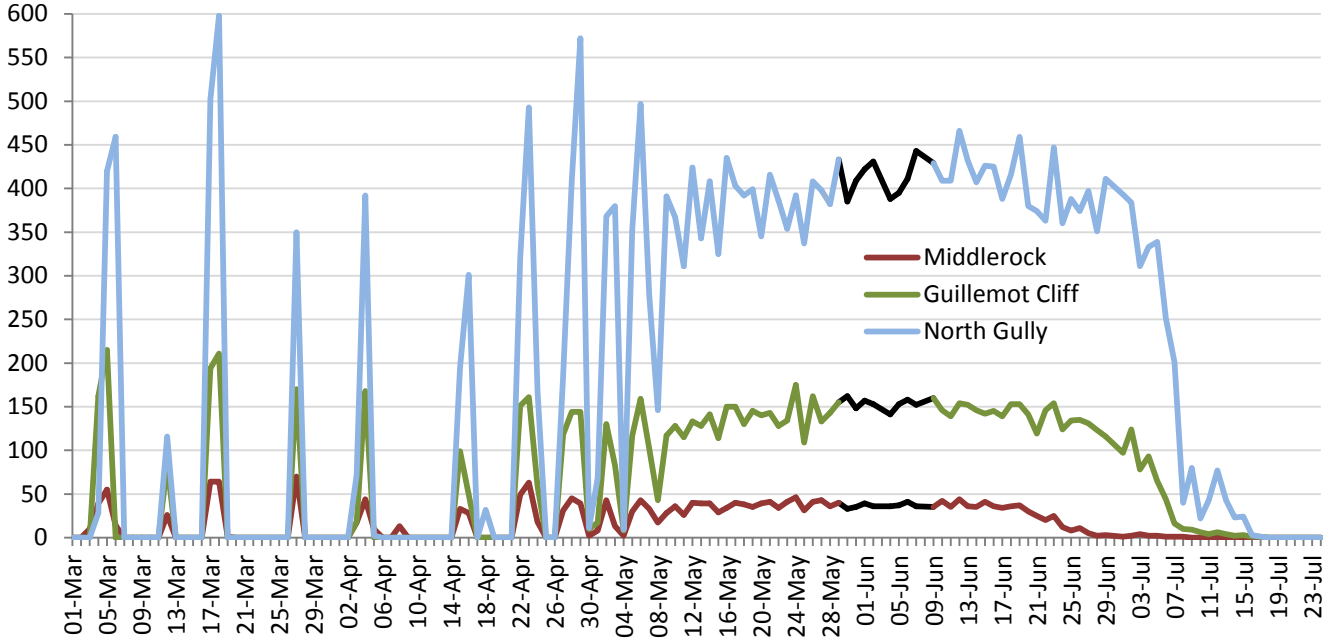
The distribution of Guillemots on suitable breeding ledges 2014-2023.



As can be seen from the above map, there were numerical declines in all bar two areas; the area around Crab Bay was again free of Guillemots (they last occupied ledges in 2016), whilst an average of two birds joined the Razorbills in Peter's Bay following an absence last year. The largest drop in numbers was seen in the area between the Jogs and the Dents where there were, on average, 191 fewer individuals (this a 13.5% decline). The largest proportional decline was seen between Twinlet and Purple Cove where there were 13.7% fewer adults on ledges (69 fewer birds). There was a 5.1% decline around the Quarry, an 8.4% decline around the Bluffs, a 10.8% decline around Little Bay, a 6.9% decline between Smith's and Far Bays and a 12.1% decline around Hog Bay. An average of only three birds were missing from the north coast of the Neck and the Stack, this a 0.5% decline. These counts of individuals on ledges potentially include incubating adults, some of their partners, failed

breeders, non-breeding adults and younger birds yet to pair; 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 close 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 3345 pairs, this 350 fewer than last year.

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



The first chick to be seen this year had only just hatched, this at Middlerock on 4th June; this was four days later than the first to be seen last year (which was also at Middlerock) and one day later than the 2013-2022 mean (the earliest chick during this period was logged on 23rd May in 2019, whilst the first chick of 2014, the year following the severe winter auk wrecks, was on 13th June). Productivity, calculated at between 0.55 and 0.61 jumplings per pair in 2013 and at 0.6 in 2007, was again not assessed in 2023 following recommendations from the Islands Conservation Advisory Committee. Chicks were watched jumping from the fourth week of June and the number of adults recorded in the three regularly monitored plots dropped from 626 on the 23rd to 530 on the 25th, 428 on 4th July and 296 on the 6th (see chart above). There were no late spikes in the number of birds occupying the plots; see previous seabird reports which document a late spike in numbers in the majority of years.

Between the 8th and 9th July, the number of adults in the Middlerock plot dropped from one to zero, this matching the third earliest departure from this plot in ten years of monitoring; between 2014 and 2022, the last day with birds in the Middlerock plot averaged 10th July, with the latest still present on the 17th in 2021 and the earliest last seen on the 1st in 2022. The lone bird present at Guillemot Cliff on 17th July was the last to be seen in this plot, this the latest departure from here for at least a decade and nine days later than the 2014-2022 mean. Counts at North Gully dropped from 24 on the 15th to three on the 16th and to one on the 17th, the latter one day later than the 2014-2022 last bird mean (the latest bird in this plot was still present on the 22nd in 2014, the earliest last seen on the 13th in 2022). This was thus only the second year of the last ten in which birds have not remained for longer at North Gully than at the other plots (a pattern probably explained by the larger North Gully population). Whole Island counts mirrored those made at the plots, with Steep Bay and the area above the Jogs the only sites to see breeding birds ashore after the 21st; there were two at each site on the 23rd, one at each site on the 24th and one at Steep Bay on the 25th, the latter five days later than the last to be seen ashore in 2022 and three days later than the 2013-2022 last bird mean (the earliest last was seen on 16th July in 2019 and the latest on the 27th in 2013 and

2021). There were no further July sightings until three were seen off the Lighthouse on the 28th, after which daily counts peaked at 19 on the 31st. There were sightings on 13 August dates (13 fewer than last year), with eight single-figure daycounts and highs of 41 on the 1st, 19 on the 13th and 15 on the 25th; an August bird-days total of 112 was the lowest since 2016 and well down on a 2013-2022 mean of 722.3 (this a period which included all-time highs of 3841 in 2018, 1129 in 2019 and 1138 in 2020). A bird ashore in Peter's Bay on 4th August mirrored the single seen ashore last August.

There were 1060 dead Guillemot collected from beaches by the Pembrokeshire local authorities during three weeks from 8th July, with 500 reported in Carmarthenshire during the same period (PCC, 2023). Moribund birds were found from Anglesey to Cardiff, with the actual number of dead Guillemot no doubt higher than officially reported. The H5N1 strain of highly pathogenic avian influenza was found in tested birds.

Sightings on 13 September dates were all of eight or less bar 21 on the 3rd and 17 on the 26th, a bird-days total of 83 being down on a 2013-2022 mean of 287.9 but up on five of the years during that period (there were all-time highs of 287 in 2012, 563 in 2014, 1419 in 2018 and 277 last year). There were an additional 318 distant, unidentified auks logged during September, this the second lowest total of the last nine years (there were all-time highs of 2613 in 2018, 1261 in 2021 and 2814 last year). Sightings of up to eight Guillemot on nine October dates totalled 33 bird-days, this down on a 2013-2022 mean of 114.4 (there was a high of 519 in 2021 when there was an unprecedentedly early return to the cliffs). An additional 457 unidentified auks were logged during October, this down on a 2013-2022 mean of 1738.6 and on all but one year during that period (there was an all-time high of 7951 in 2021). There was again a staff presence throughout November, with sightings on 13 dates and highs of 16 on the 12th and 22nd and 11 on the 27th taking the bird-days total to 100; the peak November daycount was down on a 2013-2022 mean of 311.4 (there was a high of 790 in 2015) and the total was down on a mean of 1231.9 logged during the same period (a high of 3441 was tallied in 2019). An additional 3706 distant auks were noted during the month, this including 1520 on the 24th which was a new November daycount high (482 on the 22nd and 455 on the 25th were the eighth and ninth highest November daycounts to date). There were no Guillemot logged during the first three days of December, although there were daily sightings of up to 52 large 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 16th November in 2013 and 24th November in 2014. However birds were seen ashore in

seven of eight subsequent Novembers, with 2017 the only year without a record (when staff departed on the 9th); the 2013-2022 mean first winter return date is 3rd November (this not including the three years without a record), with the earliest ashore on 23rd October 2021 and 1st November 2019, the latest on 6th November in 2018 and 2022 and 11th November 2015 (a landfall on 27th October 1999 is the only other to be documented prior to 6th November). A fresh leg was above the Dents on 7th November this year, although no birds were seen ashore and there was no guano at the sites which typically hold early returning birds. Two at North Gully on 26th November were the only Guillemot to be seen ashore prior to the 3rd December staff departure; there was again no guano found elsewhere. Such a return to the colony outside of the breeding season, with the risk of being attacked, must have a substantial benefit; it has been suggested that the return may be to secure the best ledge and thus attract the best mate (Harris *et al*., 2006), but birds ashore may also use less energy than those at sea (Humphreys *et al*., 2007). The majority of early winter sightings of birds ashore come from the ledges above the Jogs; this site holds the largest breeding season aggregation, perhaps suggesting that the need to come to land is greater in birds which occupy areas with more neighbours.

Ringing recovery Left leg white darvic with black 48T, Right leg N01129
Originally ringed as a pullus, THE AMOS, SKOMER ISLAND, PEMBROKESHIRE 2nd July 2006
Previously recovered as an adult, NORTH GULLY, SKOKHOLM 11th July 2021
Recovered as an adult, NORTH GULLY, SKOKHOLM 5th July 2023
Finding condition Colour ring read in field
Distance travelled 4km at 163 degrees (SSE)
Days since ringed 6212

Ringing recovery Left leg white darvic with black 24A, Right leg N03025
Originally ringed as a pullus, THE AMOS, SKOMER ISLAND, PEMBROKESHIRE 3rd July 2006
Previously recovered as an adult, NORTH GULLY, SKOKHOLM 15th April 2022
Recovered as an adult, NORTH GULLY, SKOKHOLM 12th and 13th June 2023
Finding condition Colour ring read in field
Distance travelled 4km at 163 degrees (SSE)
Days since ringed 6188 and 6189

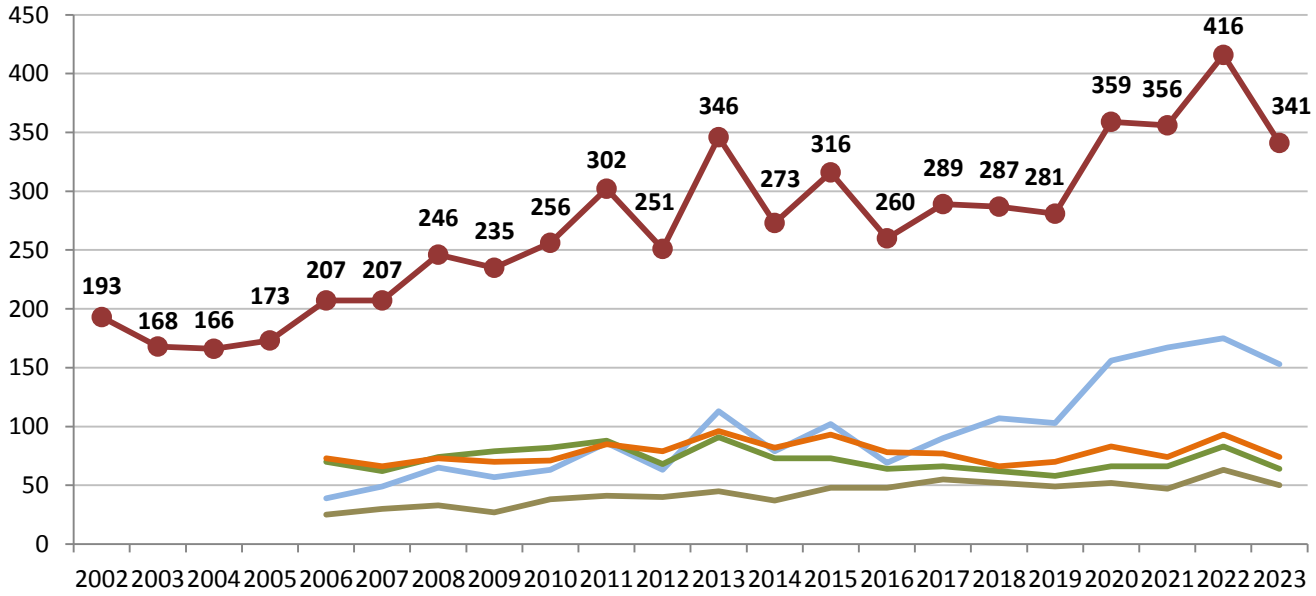
Ringing recovery Left leg N07823, Right leg blue darvic with white 0308
Originally ringed as a pullus, THE AMOS, SKOMER ISLAND, PEMBROKESHIRE 27th June 2016
Recovered as an adult, NORTH GULLY, SKOKHOLM 20th April 2022 (sic)
Finding condition Colour ring read in field
Distance travelled 4km at 163 degrees (SSE)
Days since ringed 2123

Razorbill *Alca torda* **Llurs**
Very Abundant Breeder Common or Abundant until 2007, numbers then increasing rapidly
23 trapped (all pulli), 4 retrapped/resighted, 1 control
1931-1976: 9705 trapped, 2013-2022: 364 trapped, 9 retrapped/resighted, 4 controls

There were sightings on 16 March dates (24 last year), with highs of 1946 on the 4th, 1391 on the 5th and 1973 on the 12th, but five further dates when fewer than six were noted and only 11,616 bird-days logged during the month (down on a 2013-2022 mean of 14,706 and on seven Marches during that period). The majority of March birds were again at sea, with 1005 on the 5th, 668 on the 12th and 659 on the 18th the highest counts of birds ashore. Daycounts continued to fluctuate during April, with highs of 2200 on the 3rd, 2460 on the 23rd and 2400 on the 29th, but lows of between zero and 46 on ten dates to the 20th. There were two dates in April when the only Razorbills ashore were those occupying crevices in the Anticline, the Oystercatcher roost perhaps offering sufficient safety

in numbers to allow for a landfall. The peak in numbers on 29th April coincided with the discovery of the first egg to be seen this year (at Middlerock), although it was soon eaten by Crows; this was 14 days later than the first to be seen last year (which was at North Gully), two days later than the 2013-2022 first egg mean and the latest first to have been recorded on Skokholm since one on 13th May 2014 (the latter was the latest for over a decade and no doubt a consequence of the prolonged winter storms preceding that breeding season, whilst the 15th April 2022 egg was the earliest on record). The majority of eggs were produced during early May, with 58% of Neck plot pairs having eggs by the 11th and 94% of Bluffs plot pairs having eggs by the 12th. A non-breeder encountered regularly at Middlerock from late May onwards had white proximal portions to both the primaries and primary coverts (below photograph).

The total number of adult Razorbill in all six study plots 2002-2023 (as an average from ten visits) and the totals from the four largest plots since 2006 (as an average from ten visits).



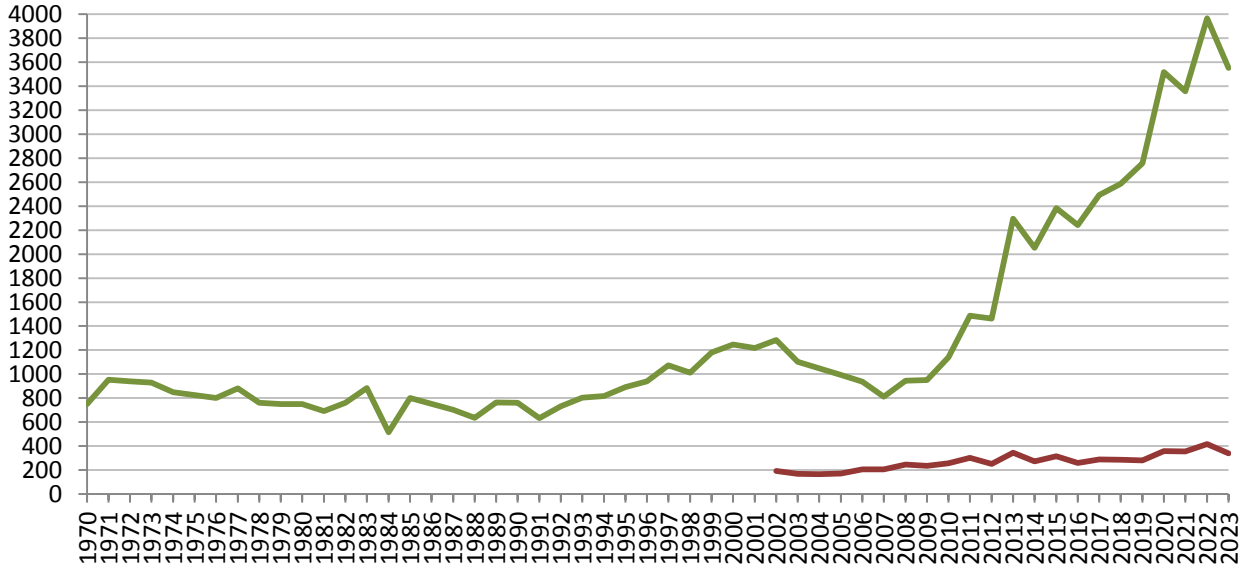
The six study plots, established in 2002, were visited on ten dates between 29th May and 9th June when every adult in suitable breeding habitat was counted. The mean single visit total of 341 adults on ledges was 75 (18.0%) down on that logged last year and down on the means recorded in 2013, 2020 and 2021, but was the fifth highest yet recorded and 7.1% up on the 2013-2022 mean (318.4 ±sd 49.4). The largest numerical decline was in Little Bay where the mean dropped by 12.6% from

175 to 153; this year's mean was only otherwise down on the 156 of 2020 and the 167 of 2021. The largest proportional decline occurred on Middlerock where the mean number of adults dropped from 83 to 64, this 22.9% decline leading to the lowest mean since the 58 of 2019 and matching the third lowest total of the last 11 years. A similar 22.6% decline was observed at Guillemot Cliff where the mean total fell from 93 to 72. With the notable exception of 2022, recent years have seen a decline in the number of Razorbill occupying the two Twinlet plots, drops tentatively linked to an increasing Fulmar population (which has no doubt led to competition for space within the confines of the plot boundaries); it is likely that this downwards trend was exacerbated this year by the activities of a Crow pair which routinely took eggs from the plot area. There was a mean of 12 fewer birds at North Gully, this a 19.0% drop on the 2022 total; a mean tally of 51 adults was still the fifth highest yet recorded. A mean of one bird joined the Guillemot ledge on the slope to Purple Cove; although up to two have been seen at this site on at least one date in each year since 2013, only singles in 2013, 2014 and 2021 and two in 2020 and 2022 have been present regularly enough to register on the ten visit mean. It was the first year since 2018 in which birds were absent from the Steep Bay plot on every visit; there was a mean of two in 2014 and 2021 and one in 2016 and 2022.

The whole Island totals (adults on ledges suitable for breeding), mean plot totals, the range of totals over ten study plot visits, the standard deviation observed over the ten visits and the percentage of the Island total made up of study plot birds 2014-2023.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Island	2052	2382	2242	2491	2585	2755	3517	3356	3965	3552
Plots	273	316	260	289	287	281	359	356	416	341
Range	254-315	291-346	236-324	253-334	263-309	230-351	312-395	312-411	376-446	299-409
±SD	19.96	15.78	26.58	25.61	13.25	40.82	30.72	34.06	23.15	31.74
Plot %	13.4	13.3	11.6	11.6	11.1	10.2	10.2	10.6	10.5	9.6

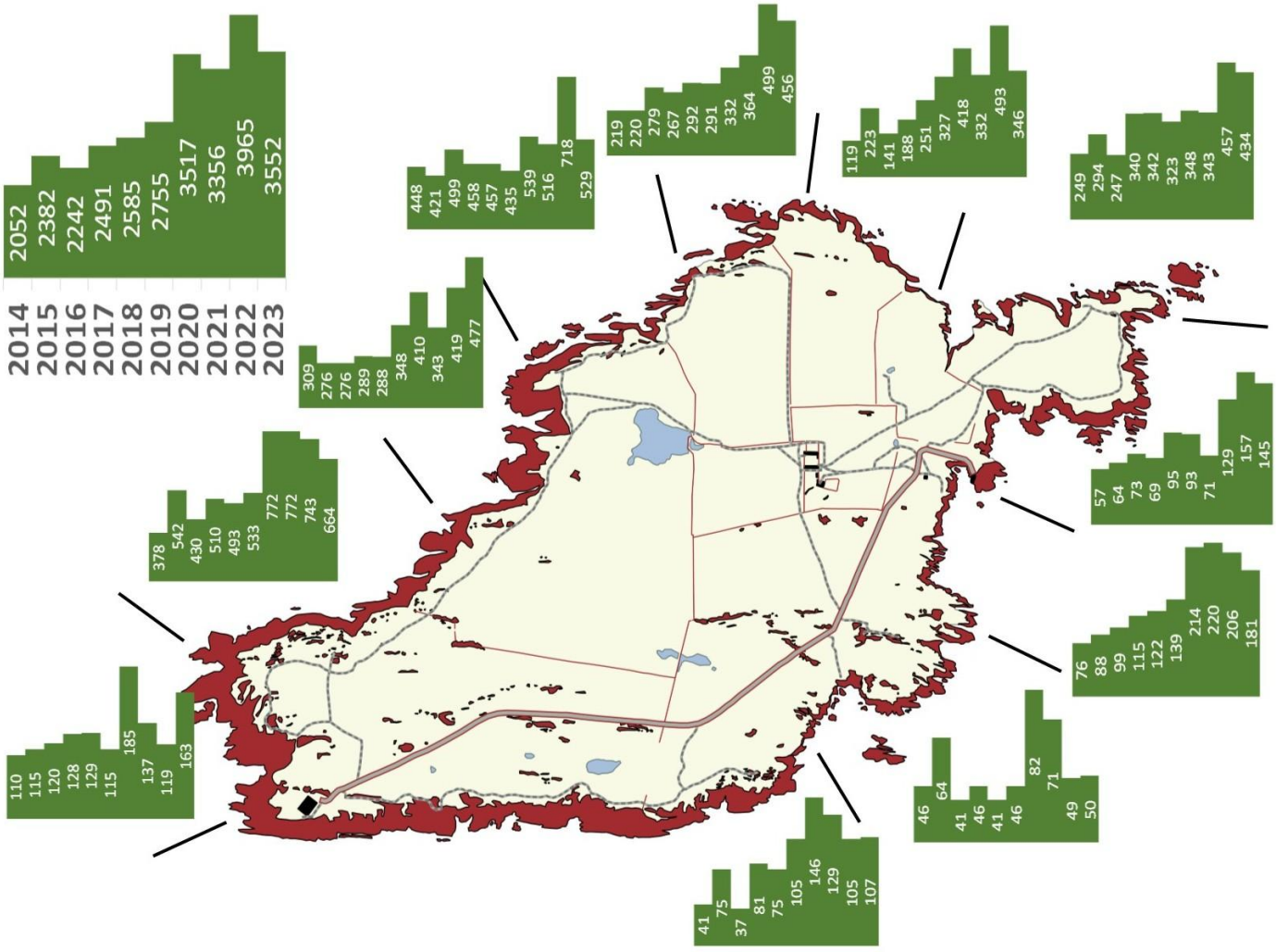
The total number of Razorbills (adults on ledges suitable for breeding) recorded on Skokholm since 1970 and the number of birds within the study plots since 2002.



Both 2020 and 2021 saw severe May weather impact the Razorbills nesting in the productivity plots (and no doubt elsewhere); a 2020 storm, with multiple waves of at least 11 metres, resulted in 60% of Neck pairs losing their eggs (but just one or possibly two of the North Gully eggs being lost), whilst a 2021 storm, with winds gusting at up to 69mph and several waves of at least 16 metres, led to 59% of Neck pairs and 7% of North Gully pairs losing their eggs. May seas peaked at eight metres in 2022 (as measured by the Mid Channel Rock Lighthouse Beacon off St Ann's Head), with rough weather on the night of 17th May probably being responsible for one egg loss at the Neck (elsewhere there

was a loss of Herring Gull eggs and chicks and some low nesting Razorbills lost eggs along the North Coast), whilst four Neck plot egg losses between the 21st and 24th May were perhaps due to heavy showers on the evening of the 23rd. The 2023 breeding season was by comparison a clement one, with no productivity plot losses directly attributable to weather events. Extreme May weather inevitably impacts the number of adults on ledges during the usual whole Island and study plot count period; in the unsettled June of 2012, plot counts fluctuated between 164 and 338 birds, whereas the 2018 counts, made during a prolonged period of high pressure, fluctuated between 263 and 309 (with the lowest standard deviation of the last 12 years (see table above)). Given that far fewer plot birds were impacted by the weather this year, it might be expected that the range in study plot counts (and the standard deviation given in the table above) might be lower than in the rough weather years of 2020 and 2021; however this was not the case, with a range of 110 birds being the second highest of the last 11 years (there was a difference of 121 in 2019) and the standard deviation being the third highest noted during the same period. It is unclear why the plot counts were so varied this year, particularly as Guillemot counts in the same areas were consistent.

The distribution of Razorbills on suitable breeding ledges 2014-2023.



Whole Island counts were made from the land between the 1st and 11th June, whilst a boat-based count was possible on 7th June. This was the 11th year running in which 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 2023 whole Island mean of

3552 adults in suitable breeding habitat was 10.4% down on the 3965 logged in 2022 but the second highest total yet recorded on Skokholm (28.5% up on the 2013-2022 mean of 2763.9 ±sd 633.6). Given the variability seen in the plot counts this year, it should be remembered that the whole Island total given here (based on fewer visits) could be less accurate than in most other years. As can be seen from the map above, the number of adults present did not decline everywhere, indeed there were increases in four areas; the largest increase occurred between Purple Cove and Twinlet where there were on average 58 more birds (a mean of 477 being a new high for this area, this despite the decline seen in the Twinlet plots), whilst there were 44 more in the vicinity of the Quarry (a mean of 163 only down on the 185 of 2020), two more along the South Coast (there have been higher means in two years) and one more between Wreck Cove and Crab Bay (there have been higher means in three years). The largest numerical decline occurred between the Jogs and the Dents where there were on average 189 fewer adults on ledges, although the mean was the third highest to be recorded in this area. There were an average of 147 fewer birds between Far and Smith's Bays, a total of 346 still the third highest to date, whilst there were 79 fewer between Wardens' Rest and Fossil Bay (there have only been higher means in the last three years), 43 fewer in the vicinity of Little Bay and Little Bay Point (the total only down on that of 2022), 25 fewer between South Haven and Hog Bay (there have been higher means in three years), 23 fewer to the north of the Neck (the total only down on the 457 of 2022) and 12 fewer around the southerly portion of the Neck (the total also only down on that of 2022). Although the drop in the whole Island count mirrored the drop at the plots, the local factors impacting some plots (namely the increase in Fulmar numbers and the impact of Crows at Twinlet) are possibly not responsible for declines elsewhere; avian influenza may have had an impact since 2022, although rough weather can also influence the population (as was seen between 2013 and 2014).

Productivity monitoring was undertaken for an 11th consecutive year. There are some concerns among ICAC members that recent Pembrokeshire productivity estimates have been quite low (on Skokholm ranging between 0.23 in 2015 and 0.69 in 2018), perhaps lower than what actually occurred given the continued growth of the population and certainly too low to maintain the expansion; one explanation for continued population growth despite low productivity estimates could be that the plots do not represent the Island as a whole. This is potentially the case at the exposed Neck plot where predation levels are often quite high and where, in recent years, extreme weather events have had a greater impact; although Razorbills nest in similarly exposed places elsewhere on Skokholm, an additional plot looking at cliff nesting pairs was established at North Gully in 2017 in an attempt to study birds in a somewhat more sheltered setting. There were thus three survey areas this year, one a cliff below the Neck Razorbill Hide where 33 incubating pairs

were mapped between the 2nd and 29th May, one the ledges around North Gully where 27 pairs were mapped between the 2nd and 18th May and one an area among the Bluffs boulders where 52 egg sites were marked between the 12th and 20th May.

The first five chicks to be encountered anywhere on Skokholm were at the Bluffs on 30th May (the oldest of which was seemingly two days old); this was three days later than the first of last year, but two days earlier than the 2013-2022 mean (which is 1st June, with the earliest on 18th May 2019 and the latest on 15th June 2013). At the Neck there were six egg stage failures, four failures at either egg or small chick stage (ledges were found empty, with no indication as to what had happened), two chick losses and 21 pairs produced jumping age chicks at the first attempt; of the pairs which failed with their first egg, two re-laid, one of which lost a large chick between the 18th and 20th July and one of which produced a jumpling. The resulting productivity figure of 0.67 matched that logged last year as the third highest value of the last 11 years, up on a 2013-2022 mean of 0.41 ±se 0.09 (productivity at this site is very variable, with highs of 0.77 in 2013 and 0.86 in 2018, but lows of 0.03 in 2016 and 0.14 in 2017). The North Gully plot saw 20 pairs successful at the first attempt, two egg stage failures (both pairs re-laid, one again failing with an egg and the other failing with a ten day old chick) and five chick stage failures. The resulting North Gully productivity value of 0.74 jumplings per pair was only down on the 0.76 of 2020 and was up on a 2017-2022 mean of 0.67 ±se 0.03 (there was a low of 0.58 in 2017). The combined productivity estimate for cliff nesting pairs was 0.71; this was up on a 2017-2022 mean of 0.56 ±se 0.06 and was the second highest estimate in this period, only down on the 0.74 of 2018 (there was a low of 0.36 in 2017 when Neck productivity was particularly poor, with 0.44 in 2021 the next lowest mean (again due to a poor season at the Neck)).

Among the Bluffs boulders, eight pairs failed at egg stage, nine pairs failed with eggs or small chicks (crevices were found empty, with no indication as to what had happened) and an unprecedented 23 pairs failed with chicks. All bar two of the chicks went missing prior to reaching jumping age, whilst one was found dead (a milky yellow substance was present in the beak) and an adjacent chick was found dying (similar beak contents were present); the dead chick was sent for HPAI testing, with both cloacal and oro-pharyngeal swabs proving negative for the disease. Only one pair produced a second egg, an attempt which again failed at egg stage. Thus only 12 pairs produced a jumpling, this equating to a productivity value of 0.23 per pair; the 2023 Bluffs productivity estimate was the lowest yet recorded at this site, down on a 2013-2022 mean of 0.55 ±se 0.04 and previous lows of

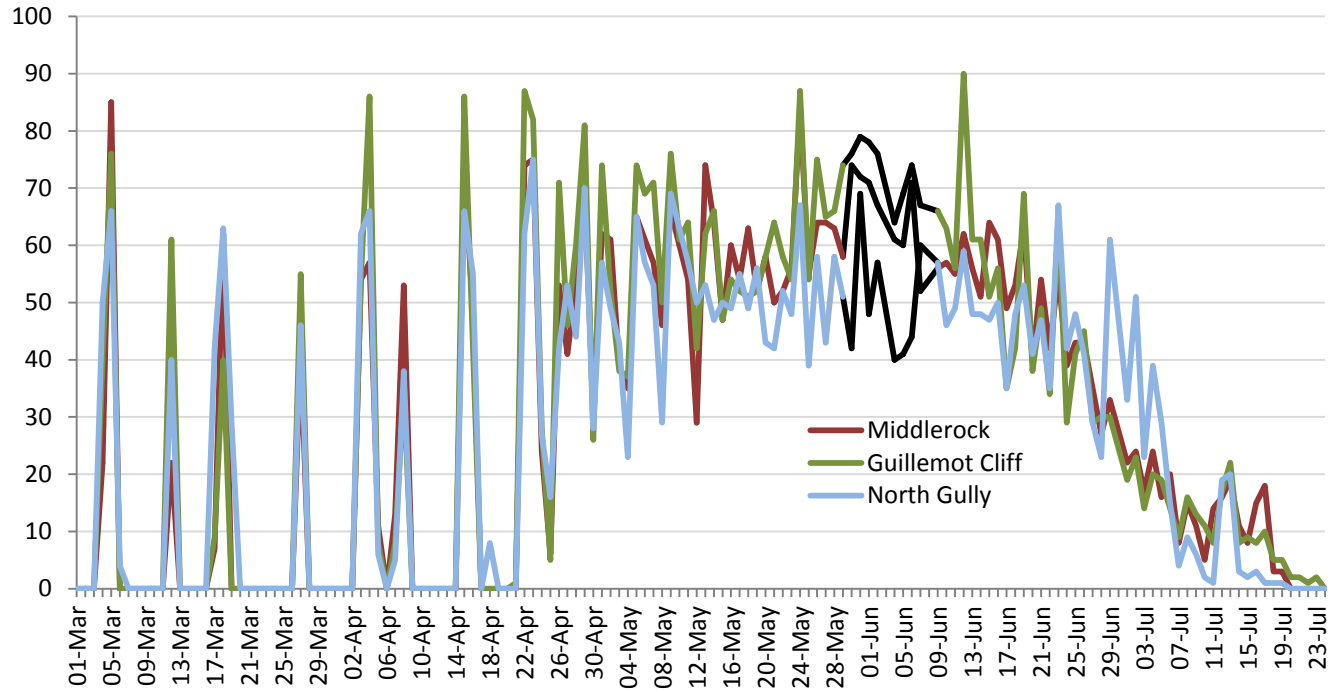
0.44 in 2014 and 0.29 in 2015 (there were highs during this period of 0.74 in 2016, 0.60 in 2018 and 0.71 in 2020). It is unclear why productivity was so poor this year, particularly given the above average productivity recorded on the cliffs; at least eight chicks went missing from sites not accessible to gulls (although no doubt reachable by the smaller corvids), whilst the two dead youngsters perhaps hint at an issue other than predation. For an 11th year running, the last of the breeding attempts within the boulders were concluded before the last of the attempts on the cliffs.

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 of 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). The former, preferred, technique produces a productivity estimate of 0.55 jumplings per pair and the latter 0.48. Although down on the 0.64 of last year, the 2023 estimate is up on that seen in five of the last ten years and up on a 2013-2022 mean of 0.51 ±se 0.05 (lows during this period were of 0.23 in 2015 and 0.39 in 2016, both these calculated prior to the establishment of the less variable and more sheltered North Gully plot, whilst the only values up on that of 2022 are the 0.66 of 2013 and the 0.69 of 2018).

In an effort to ascertain the pattern of colony attendance, near daily counts were made at three of the plots throughout the breeding season (see chart below). There were again fluctuating numbers in all three subcolonies following the usual count period and regular peaks when the totals were augmented by the return of partners, failed adults, successful females or non-breeding birds; interestingly these peaks were again broadly consistent between subcolonies, suggesting that returning auks respond to the same environmental cues (in previous years the peaks have also coincided with increases in Guillemot numbers, although counts of the latter did not peak as usual this year (see above)). The first jumpling had departed the productivity plots by 18th June; this was six days later than the first of last year and the latest first of the last five years, two days later than the 2015-2022 mean (between 2015 and 2022 the first productivity plot chick jumped between the 8th and 26th June). The number of adults within the three plots declined during June, with only double-figure totals logged from 1st July (the 2014-2022 mean is 4th July, ranging between 30th June in 2019 and 10th July in 2018) and single-figure counts from 18th July (the 2014-2022 mean is 13th July, ranging between 9th July in 2019 and 2022 and 18th July in 2014 and 2018). Although this was a poor year at the Bluffs (see above), all of the study chicks at this site had departed by 24th June (three further attempts had failed by the 29th), whilst 12 of 33 attempts at the Neck plot and 13 of

27 attempts at the North Gully plot were still active on 1st July. The last seemingly successful North Gully chick jumped between the 9th and 10th July (a late chick perished between the 18th and 19th) and the last seemingly successful Neck chick jumped by 16th July (a late chick perished between the 18th and 21st). Across the Island there were 45 adults ashore on 19th July and single-figure counts each day from the 20th until 25th July, with one in Purple Cove on the 27th the last to be seen on land; the 2013-2022 mean last adult ashore date is 27th July, with the earliest lasts logged on 24th July in 2015, 2016 and 2017 and the latest on 2nd August in 2018.

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



There were sightings of Razorbill at sea on 16 August dates, with highs of 23 on the 3rd and 20 on the 14th taking the bird-days total to 119; there have been higher August daycounts in six years and higher bird-day totals in four years (a record August daycount of 159 took the 2020 tally to a record 575). Counts on 13 September dates, with highs of 98 on the 19th, 45 on the 25th and 52 on the 28th, led to a bird-days total of 282, this the sixth highest September tally to date; five of the six highest September bird-day totals have been recorded in the last seven years, with a peak of 1708 logged in 2017. October counts were low for a second straight year, with birds noted on 16 dates and highs of only 14 on the 16th and 12 on the 23rd taking the bird-days total to just 76; the peak October daycount was the lowest of the last 12 years, whilst the total was the third lowest logged during the same period (the 2013-2022 October bird-days mean is 369.3, with an all-time high of 1224 in 2019 and a low of 56 last year). November counts were also below average, with sightings on 13 dates including highs of 25 on the 8th and 14 on the 11th which took the total to 76; the 2013-2022 peak November daycount mean is 40.6 and the mean bird-days total for the same period is 98.2. There were no Razorbill seen ashore for an 11th successive November, this seemingly an auk behaviour confined to Guillemot during the early winter period. The only December record was of one in Broad Sound being eaten by a Great Black-backed Gull on the 3rd. Further large auks were present at sea during the autumn, but they remained unidentified due to their distance from the Island; there were 318 in September (66.6% down on a 2013-2022 mean of 952.6), 457 in October (73.7% down on a 2013-2022 mean of 1738.6), 3706 in November (this including a new November daycount high of 1520 on the 24th and the third highest tally in this month) and 99 in the first three days of December.

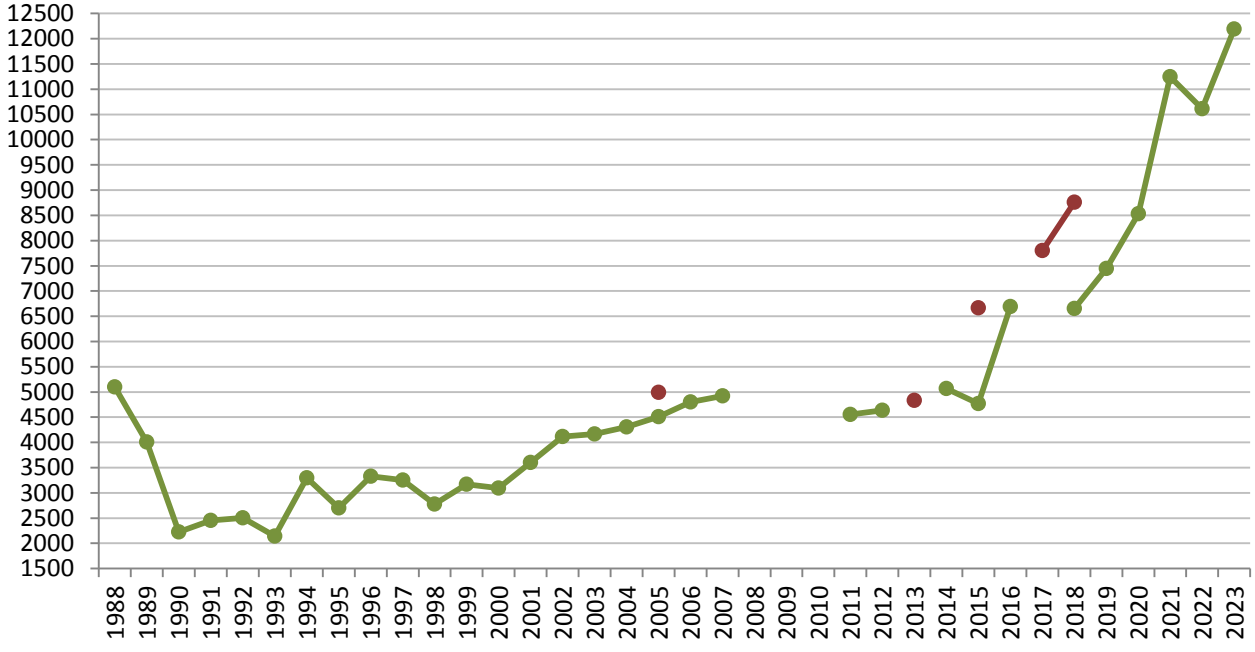
Ringing recovery M93635
Originally ringed as a pullus, SKOMER ISLAND, PEMBROKESHIRE 24th June 1999

Previously Recovered as an adult, THE DENTS, SKOKHOLM 27th April 2018
Recovered as an adult, THE DENTS, SKOKHOLM 19th May 2023
Finding condition Metal ring read in field
Distance travelled 4km at 163 degrees (SSE)
Days since ringed 8730

Puffin *Fratercula arctica* **Pâl**
Very Abundant Breeder
74 trapped (including 29 pulli), 4 retrapped, 220 resighted, 1 control
1936-1976: 5412 trapped, 2011-2022: 766 trapped, 33 retrapped, 2066 resighted, 1 control

One off South Haven on the afternoon of 2nd March was the first of the year, this 11 days earlier than the 2013-2022 first arrival mean and the second earliest returning individual yet recorded (there was a single on the 1st in 2019). There were 112 logged the following day, 108 of which were off South Haven; this was the earliest ever three-figure daycount, 15 days earlier than the 2013-2022 mean (the earliest three-figure daycount prior to this year was logged on 9th March 2021, the latest of the last 12 years on 31st March 2014). There were no sightings on five of the next eight dates, including on the 11th which is now the only March date without a record. A minimum of 1730 on the 12th was the earliest ever four-figure daycount, this ten days earlier than the 2013-2022 mean (a count of 1741 on 15th March 2022 was the previous earliest, a count of 3491 on 4th April 2014 the latest of the last 12 years). Despite the large attendance and several records of wheeling birds, a landfall was not recorded on the 12th, indeed it was not until the 17th that birds were first seen ashore; this matched 2020 as the second earliest landfall to date, two days later than the first of last year and seven days earlier than the 2013-2022 first landfall mean (the latest first landfall during this period was on 6th April 2013). There followed sightings on every March date bar the 22nd and 31st, the bird-days total for the month coming to 29,915; the five highest March bird-day totals have occurred in the last five years. Between 2013 and 2019, daily counts were made from around the Neck each spring evening to record the pattern of colony attendance and to help select the most productive times for a whole Island count (see the 2013-2019 Seabird Reports for charts showing spring attendance around the Neck). The impetus for the 2023 whole Island count on 27th March was an assessment of the (again remarkable) number of birds rafting in and around South Haven.

The maximum Puffin daycount recorded each spring during the period 1988-2023. Green points represent counts made during March and April, maroon points counts made in May.

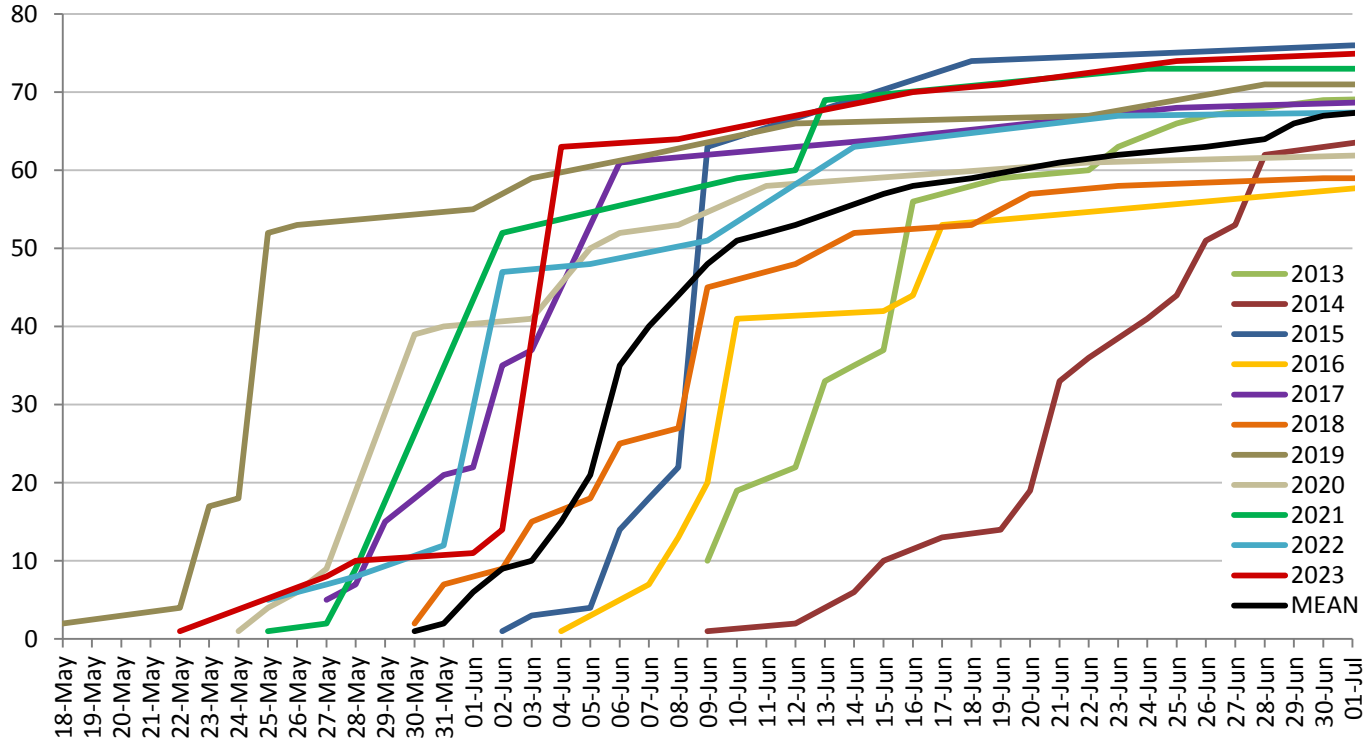


The 27th March whole Island survey produced a total of 12,192 individuals (to the north there were 3615 on the sea, 29 in the air and four ashore, to the south 2668 on the sea, 222 in the air and 1527 ashore and around the Neck there were 4073 on the sea, 26 in the air and 28 ashore); although numbers are still well down on Lockley's spring estimates of approximately 40,000, this was the highest post-War spring count, up on the 10,000 logged on nine occasions between 6th April 1950 and 22nd April 1953, the 11,245 counted on 22nd March 2021 and the 10,611 present on 23rd March last year. The 2023 south coast total was 426 down on that of 2022 (and 737 down on that of 2021), however the Neck total was 695 up and the north coast total 1312 up, both the latter tallies new highs. The north coast count included only 13 in the region of the Quarry, this area probably now home to five times this number. The whole Island counts provide a relatively consistent long-term method for monitoring the trend in numbers, however it is difficult to ascertain how the totals reflect the actual size of the Skokholm breeding population. Monitoring work at the Crab Bay study plot revealed 79 active burrows in an area which comprises approximately 10% of the colony and where less than half of occupied burrows were study burrows; we might thus predict a very rough minimum of 1580 pairs for Crab Bay (as active burrow distribution is apparently quite even), 3160 individuals being close to the 2997 seen during the 27th March whole Island count. Notable range expansions included a bird ashore to the west of the Lighthouse Manx Shearwater plot on 18th June and one visiting a Western Plain burrow only ten metres from the inland Bracken edge on 21st June. Puffins nested in the new Crab Bay Hide for the first time, with at least three of the roof top boxes (photograph below) and three of the one-way glass tunnels being occupied (an additional burrow was dug by Puffins on the roof); unfortunately none nested in viewable positions this year (see the introduction to the 2022 Annual Report for further information).

A productivity plot established at Crab Bay in 2013 was used for an 11th season. Of 90 marked non-bifurcating burrows, 71 were seen to be occupied and were visible throughout the season (68 in 2022); productivity estimates are based on observations of these burrows. Chick provisioning was first witnessed on 18th May, with a successful delivery made on the north coast; this was on the same date as the first of last year and six days earlier than the 2013-2022 mean (the earliest in this period was logged on 14th May in 2019 and the latest on 3rd June in a post-wreck 2014). The mean 2013-2022 first fish delivery to the Crab Bay plot is 29th May, this five days after the whole Island mean (in 2020 the first plot delivery was on the same date as the first delivery anywhere, whereas in 2013 it was ten days later); this year saw a fish delivery to a plot burrow on 22nd May, this three days earlier than the first of last year and seven days earlier than the mean (see the graph below for the

first plot delivery dates logged in previous years). The first daylight hours watch showed that 79% of study burrows had been provisioned by 4th June, the 2023 chick feeding period approximately three weeks earlier than in 2014 (the breeding season which followed the most severe winter storms recorded during this study). The breeding season is seemingly getting earlier; the five earliest chick provisioning periods between 2013 and 2023 have occurred in the last five years. Four active burrows (5.63%) were not seen to be provisioned with fish and it is assumed that these failed at egg stage (the 2013-2022 mean is 6.63%, with a low of 2.82% in 2021 and a high of 14.71% in 2022).

The number of study burrows which had been provisioned with fish by a particular date each year, along with the 2013-2022 mean.



Although the study plot was visited regularly following the first recorded fish delivery, 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 amassed to allow further comparisons to be made in the future (see 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 when burrows contain large chicks is inevitably the main issue with this technique, necessitating earlier watches to detect chick hatching dates (which since 2013 have varied by as much as a month). Whereas five daylight hours watches were performed in each year between 2014 and 2019 and in 2021 and 2022, a COVID-19 dictated staffing shortage meant that the five 2020 watches each lasted from 0430-1700hrs only; this year the watches again lasted all of the hours of daylight.

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

No. of deliveries	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
No. of burrows 4 June		13	8	9	8	8	2	5	5	1	1	1	1			1
No. of burrows 16 June	2	2	4	1	3	6	7	4	6	8	6	7	6	2	1	
No. of burrows 25 June		4	3	3	7	10	8	12	6	6	4	2	2	1		
No. of burrows 8 July		9	7	4	6	5	3	4	5	2	1	1				
No. of burrows 16 July		1	6	2	1		3			1	1	1	2			3

Calculating productivity using only three daylight watches. The first watch was between 25th May and 28th June (dependent on the date of first fish delivery that year), the second between 11th June and 8th July and the third between 28th June and 24th July. Chicks are assumed to have fledged if fed on a minimum of two watches. Ad hoc productivity is based on a chick reaching 31 days and the mean is that from 2013-2022.

	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.
2023	22 May	26 Jul	39	22 (4/6 - 25/6)	5	22 (25/6 - 16/7)	12	43 (4/6 - 16/7)	**0.79** (56 of 71)	0.52
2022	25 May	25 Jul	31	22 (2/6 - 23/6)	7	21 (23/6 - 13/7)	11	42 (2/6 - 13/7)	**0.72** (49 of 68)	0.53
2021	25 May	24 Jul	38	23 (2/6 - 24/6)	11	20 (24/6 - 13/7)	8	42 (2/6 - 13/7)	**0.80** (57 of 71)	0.62
2020	24 May	14 Jul	3	13 (30/5 - 11/6)	16	22 (11/6 - 2/7)	33	34 (30/5 - 2/7)	**0.78** (52 of 67)	0.64
2019	18 May	24 Jul	19	19 (25/5 - 12/6)	9	17 (12/6 - 28/6)	29	35 (25/5 - 28/6)	**0.76** (57 of 75)	0.55
2018	30 May	30 Jul	20	22 (9/6 - 30/6)	11	18 (30/6 - 17/7)	15	39 (9/6 - 17/7)	**0.75** (46 of 61)	0.56
2017	27 May	30 Jul	33	20 (6/6 - 25/6)	6	18 (25/6 - 12/7)	16	37 (6/6 - 12/7)	**0.80** (55 of 69)	0.57
2016	04 Jun	13 Aug	7	16 (17/6 - 2/7)	3	13 (2/7 - 14/7)	38	28 (17/6 -14/7)	**0.73** (48 of 66)	0.64
2015	02 Jun	05 Aug	16	14 (18/6 - 1/7)	2	12 (1/7 - 12/7)	42	25 (18/6 -12/7)	**0.75** (60 of 80)	0.55
2014	09 Jun	06 Aug	14	11 (28/6 - 8/7)	4	17 (8/7 - 24/7)	38	27 (28/6 -24/7)	**0.74** (56 of 76)	0.50
Mean	**29 May**	**30 Jul**							**0.76**	**0.56**

Puffins can fledge having spent 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 were counted as fledged when they had reached as little as 22 days old (see table above). However it would be incorrect to assume that only those provisioned on all three watches went on to fledge; early hatchers 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 ad hoc recording, the 2013 to 2023 productivity estimates of between 0.72 and 0.80 fledglings per pair include birds which did not fledge; there have been examples each year of chicks already counted as having fledged which were eaten or found dead (this including the chick in burrow 52 this year which was eaten at approximately 43 days old and the chick in burrow 80 which was mauled by a Lesser Black-backed Gull (having lain dazed for a few minutes it stumbled back to its burrow, although it was not seen to be provisioned again)). This technique also misses fledglings in some years, with apparently successful chicks known to hatch after the second watch (which were thus recorded on only one of three watches and assumed to have failed). Nevertheless this more standardised monitoring suggests that a 2023 productivity figure of 0.79 was similar to that of recent years (the 2013-2022 mean is 0.76 ±se 0.01). 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 2023 data suggests that, of the 71 monitored attempts, perhaps as few as 37 were successful (0.52 fledglings per pair); the 2013-2022 mean ad hoc productivity figure is 0.57 ±se 0.02, with a high of 0.64 in 2016 and 2020 and a low of 0.49 in 2013. At least 44 attempts saw a chick reach a minimum of 26 days (62.0% or 0.62 chicks per pair, see table below); this figure was very close to the 0.65 of last year.

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

Days	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50
No. of burrows	6		1		16	7	20	2	15	

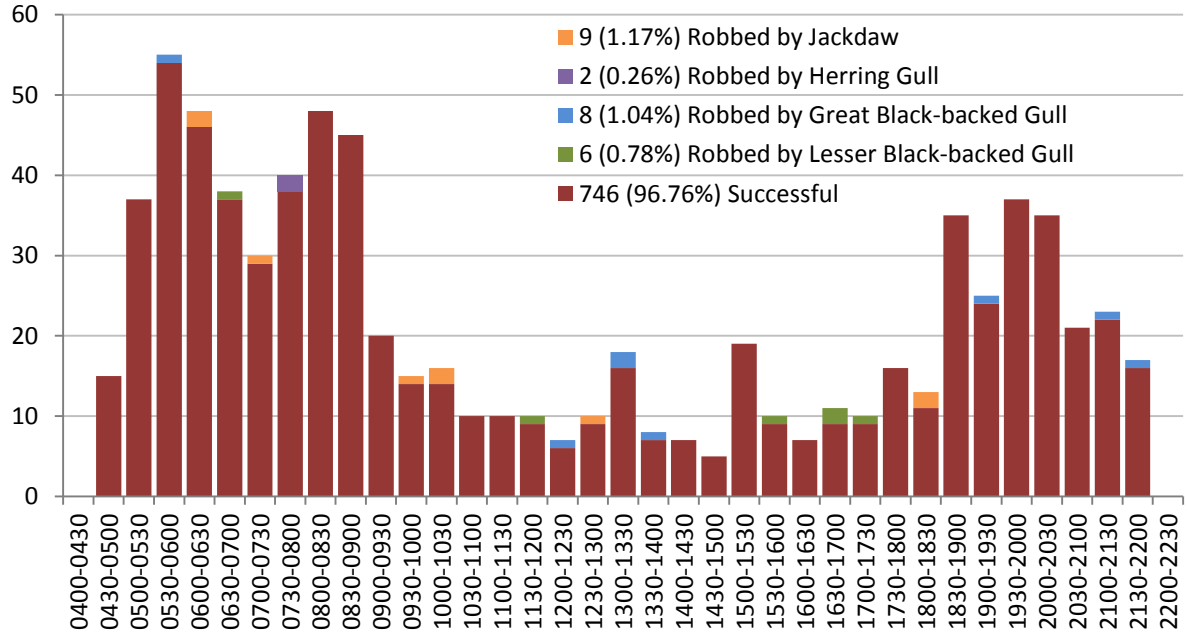
The number of fish deliveries made to the study plot during each daylight hours watch, the number of Puffins which lost fish over the plot and the percentage which lost fish.

		Watch 1	Watch 2	Watch 3	Watch 4	Watch 5	Total
2023	Number of deliveries	771	1379	1395	555	399	**4499**
	Number parasitised	25	22	81	23	18	**169**
	Percentage parasitised	3.24	1.60	5.81	4.14	4.51	**3.76**
2022	Number of deliveries	497	880	1131	541	243	**3292**
	Number parasitised	7	12	13	15	10	**57**
	Percentage parasitised	1.41	1.36	1.15	2.77	4.12	**1.73**
2021	Number of deliveries	464	891	1262	813	394	**3824**
	Number parasitised	13	11	9	11	5	**49**
	Percentage parasitised	2.80	1.23	0.71	1.35	1.27	**1.28**
2020*	Number of deliveries	357	553	600	659	170	**2339**
	Number parasitised	22	37	3	10	5	**77**
	Percentage parasitised	6.16	6.69	0.50	1.52	2.94	**3.29**
2019	Number of deliveries	579	929	504	429	228	**2669**
	Number parasitised	25	18	14	18	5	**80**
	Percentage parasitised	4.32	1.94	2.78	4.20	2.19	**3.00**
2018	Number of deliveries	701	852	527	511	359	**2950**
	Number parasitised	19	12	8	8	33	**80**
	Percentage parasitised	2.71	1.41	1.52	1.57	9.19	**2.71**
2017	Number of deliveries	844	991	1100	527	177	**3639**
	Number parasitised	30	11	3	7	5	**56**
	Percentage parasitised	3.55	1.11	0.27	1.33	2.82	**1.54**

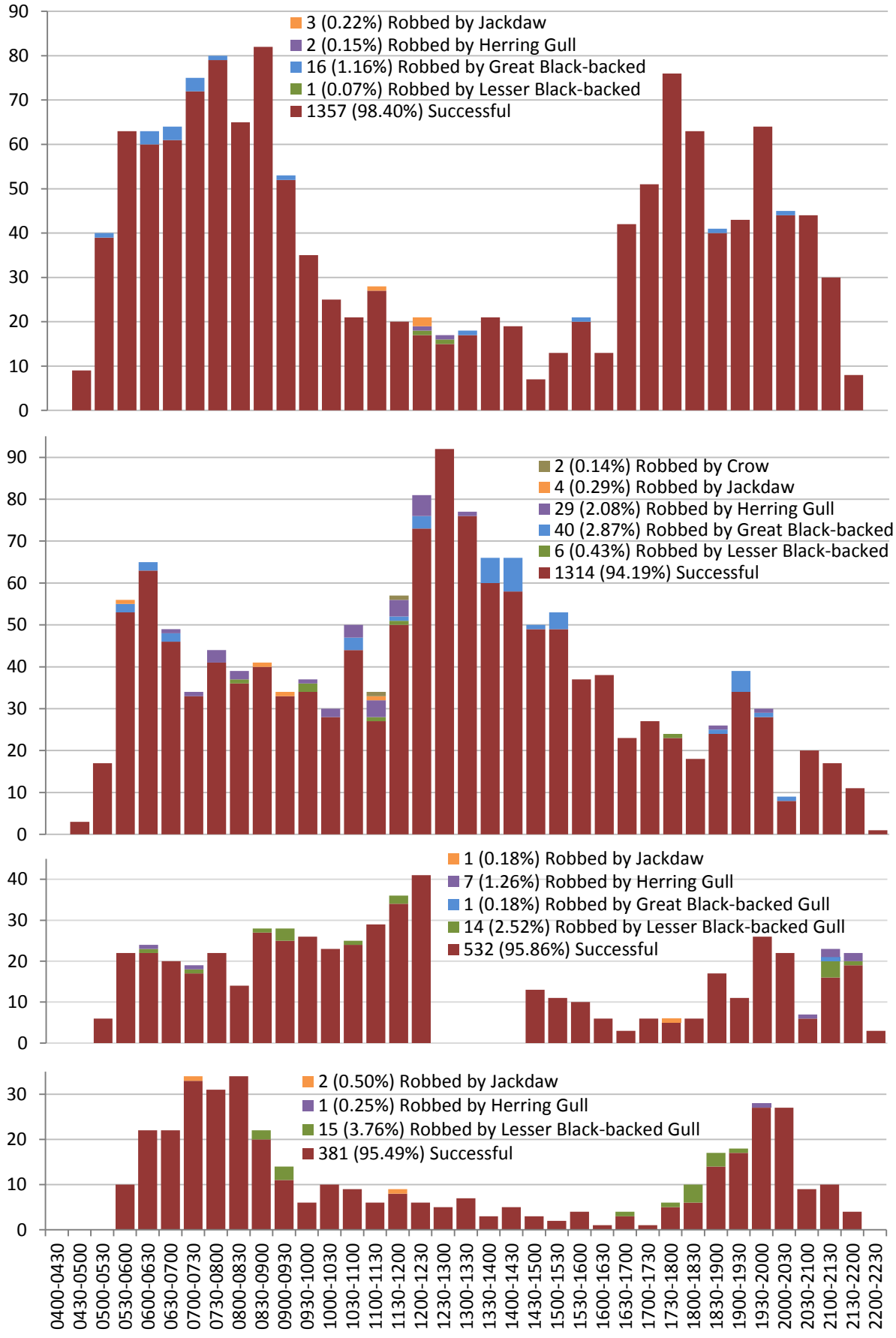
*watches stopped at 1700hrs.

The five daylight watches were also used to monitor kleptoparasitism. The study plot was confined to the area of the 90 numbered burrow stakes at Crab Bay. On 4th June 771 Puffins arrived to the study area with fish and of these 25 (3.24%) were successfully robbed. On 16th June 1379 arrived and 22 (1.60%) were robbed. On 25th June 1395 arrived and 81 (5.81%) were robbed. On 8th July 555 arrived and 23 (4.14%) were robbed. On 16th July 399 arrived and 18 (4.51%) were robbed. These figures do not take into account the number of fish lost to gulls at sea or on the approach to the colony. The total number of deliveries witnessed over the five watches was a new high, up on the 3824 of 2021. In terms of the percentage of deliveries lost over the study plot, a five visit mean of 3.76% was the highest since the 4.51% of 2016 and up on a 2013-2022 mean of 3.47%. Over the five 2023 watches, 1.51% of deliveries were taken by Lesser Black-backed Gull (the fourth lowest of the last ten years and down on a 2014-2022 mean of 2.31%), 1.05% were taken by Great Black-backed Gull (the third highest of the last ten years), 0.80% were taken by Herring Gull (the highest of the last ten years), 0.47% by Jackdaw (the highest of the last ten years) and 0.03% by Crow (the highest of the last ten years). Jackdaw were not seen to take fish during plot watches between 2013 and 2017, took between 0.04% and 0.07% of deliveries between 2018 and 2021 and took 0.39% last year.

The number of chick provisioning attempts during daylight on 4th June 2023, along with the number of times that gulls and corvids successfully robbed the fish.



The number of chick provisioning attempts during daylight on the 16th and 25th June and the 8th and 16th July 2023, along with the number of times that gulls and corvids 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 217 birds (93.94%) are now known to have been alive in 2015, of a 2014 total of 231 (57 ringed in 2014 plus 173 (93+40+41) 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.

	2011	2012	2013	2014	2016	2017	2018	2019	2021	2022	Total	Survival after one year
Total Ringed	128	58	51	57	23	24	31	28	40	30	470	
Seen in 2012	72										72	
Alive in 2012	114										114	
% survival	89.06										89.06	-
Seen in 2013	102	52									154	
Alive in 2013	111	55									166	
% survival	97.37	94.83									96.51	**97.37**
Seen in 2014	86	36	37								159	
Alive in 2014	93	40	41								174	
% survival	83.78	72.73	80.39								80.18	**80.12**
Seen in 2015	78	37	35	50							200	
Alive in 2015	86	39	38	54							217	
% survival	92.47	97.50	92.68	94.74							93.94	**93.68**
Seen in 2016	67	34	32	43							176	
Alive in 2016	79	38	36	48							201	
% survival	91.86	97.44	94.74	88.89							92.63	**92.63**
Seen in 2017	71	35	31	44	19						200	
Alive in 2017	79	38	33	45	20						215	
% survival	100.00	100.00	91.67	93.75	86.96						95.98	**97.01**
Seen in 2018	69	34	28	40	19	20					210	
Alive in 2018	75	37	31	41	20	23					227	
% survival	94.94	97.37	93.94	91.11	100.00	95.83					94.98	**94.88**
Seen in 2019	65	33	27	36	17	20	21				219	
Alive in 2019	68	36	29	39	19	23	30				244	
% survival	90.67	97.30	93.55	95.12	95.00	100.00	96.77				94.57	**94.27**
Seen in 2020	60	31	23	33	15	18	22	17			219	
Alive in 2020	63	34	26	38	17	22	29	25			254	
% survival	92.65	94.44	89.66	97.44	89.47	95.65	96.67	89.29			93.38	**93.85**
Seen in 2021	57	30	23	28	16	16	25	22			217	
Alive in 2021	59	32	25	33	17	20	28	25			239	
% survival	93.65	94.12	96.15	86.84	100.00	90.91	96.55	100.00			94.09	**94.09**
Seen in 2022	47	29	21	29	13	19	21	18	26		223	
Alive in 2022	53	29	24	32	16	19	26	23	32		254	
% survival	89.83	90.63	96.00	96.97	94.12	95.00	92.86	92.00	80.00		91.04	**92.89**
Seen in 2023	38	21	20	27	11	14	22	20	28	19	220	
% survival	71.70	72.41	83.33	84.38	68.75	73.68	84.62	86.96	87.50	63.33	77.46	**79.13**

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 ringed in the first year, 166 between 2012 and 2014, 106 between 2016 and 2019 and 70 between 2021 and 2022; a further 21 adults were colour marked 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 plot or probably because their rings have been missed. Indeed 26 were not seen for two years (including two which went missing for two years twice), 13 were not seen for three years, two were not seen for four years and two were not confirmed for five years. Additionally one was missing for nine years, although this was due to ring loss. We now know that when 223 were seen last year, at least 254 were alive; between

2013 and 2022 a mean of 90.40% of known live birds were seen each year. A 2022-2023 survival figure of 77.46% is thus likely to increase in the future. With 12 years of resighting data now available, we can start to look at fluctuations in survival over time. The percentage of birds surviving the winter during the period 2011 to 2022 has varied between 80.18% (2013-2014) and 96.51% (2012-2013), with only the 2014 return rate being below 89% and a 2012-2022 mean of 92.40% ±sd 4.58. A flaw with this survival estimate is that colour marks were added to Puffins caught in flight, birds 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). The resulting survival estimates range from 80.12% (2013-2014) to 97.37% (2012-2013), with a 2013-2022 mean of 93.08% ±sd 4.82. The most striking feature of these estimates is the substantial drop in survival 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.

Puffins were again taken regularly by Great Black-backed Gulls during the breeding season, checks of the Buzzard nest revealed fresh carcasses and Lesser Black-backed Gulls took Pufflings on occasion. Adult losses became rarer during the Puffling feeding period, dropped fish seemingly a sufficient deterrent. Crab Bay was regularly quiet from 7th July and was almost devoid of surface birds on the 23rd, however the North Coast and Neck remained busy (birds in the latter areas seemingly also bred a little later last year). The last four-figure daycount was logged on 22nd July, two days earlier than the last of 2022, and raft counts remained in the hundreds until 30th July (between 2013 and 2022 the last three-figure daycount averaged 2nd August, with the earliest on 29th July 2020 and the latest on 6th August 2014). Daily August sightings to the 8th peaked at 26 on the 1st and 18 on the 3rd. The last fish delivery to be seen this year was made to a burrow above Steep Bay on 8th August, this three days earlier than the last of 2022 and four days earlier than the 2013-2022 mean; the latest last delivery recorded during this period was on 23rd August 2014, whilst one on 4th August 2019 was the earliest (the latter the only last delivery earlier than that of this year). A second bird was seen at sea on 8th August, these the last of the year.

Ringing recovery EJ99230
Originally ringed as a pullus, SKOMER ISLAND, PEMBROKESHIRE 6th July 2006

Recovered as an adult, CRAB BAY, SKOKHOLM 14th May 2023
Finding condition Metal ring read in field
Distance travelled 4km at 163 degrees (SSE)
Days since ringed 6156

Ringing recovery EZ16232
Originally ringed as an adult, SKOKHOLM 17th July 2015
Recovered as an adult, PLAGE SUD, BISCARROSSE, LANDES, FRANCE 14th January 2023
Finding condition Fresh dead on beach
Distance travelled 861km at 160 degrees (SSE)
Days since ringed 2738

Ringing recovery EZ85652
Originally ringed as a pullus, SKOKHOLM 23rd June 2018
Recovered as an adult, NEWHAVEN, EAST SUSSEX 7th January 2023
Finding condition Fresh dead on beach
Distance travelled 385km at 106 degrees (ESE)
Days since ringed 1659

Storm Petrel *Hydrobates pelagicus* **Pedryn Drycin**
Abundant Breeder a 2016 whole Island survey predicted 2383 occupied sites
415 trapped (including 63 pulli), 12 retrapped, 21 controls
1933-1976: 18,473 trapped, 2011-2022: 6747 trapped, 662 retrapped, 278 controls

Despite the sizable Skokholm breeding population and the significant amount of time dedicated to seawatching, Storm Petrels typically prove a rare sight at sea. Indeed the only at sea sightings this year were of one off South Haven on the afternoon of 22nd July, one heading northwest off the Lighthouse on 5th August, two off the Lighthouse on 19th August, five feeding around a Great Black-backed Gull off Crab Bay on 19th September and a further four past on the latter date. With the exception of a small number of incubating adults visible in shallow crevices or in nest boxes, all other 2023 sightings came at night, although birds occasionally called from holes during the day and vocal responses were elicited for monitoring purposes. The first record of the year was of three heard during the day on 25th April and five were around the Quarry on the night of the 26th; the former were ten days earlier than both the first diurnal record of last year and the 2013-2022 mean (the earliest during this period was heard on 23rd April 2017 and the latest on 25th May 2013). Birds lingering around Migration Rocks on the nights of 23rd May and 16th June were notable; there were no records included for this area during the 2016 whole Island survey. The infrared viewing equipment again proved popular, producing peak nocturnal counts from the Quarry of at least 104 on 26th May, 154 on 9th June and 105 on 23rd June. Interestingly a Storm Petrel was watched dipping down onto the surface of Orchid Bog on the night of 12th August.

Four playback transects established at the Quarry in 2010, along with plots in North Haven Gully and along two of the walls which radiate from the Farm, potentially provide a sound method for monitoring changes in the Skokholm population (see the 2013-2019 and 2021-2022 Seabird Reports for full details). Unfortunately the COVID-19 dictated Island closure meant that there were insufficient staff to safely survey the boulder areas in 2020, however a check of the accessible crevices used for productivity monitoring revealed incubating adults in the vast majority of usual sites. We were joined by two Long-term Volunteers for the full survey period this year, this allowing work to be completed in the usual period; ten visits were made to the study areas between 20th June and 16th July. An MP3 recording of male song was played into every crevice encountered along the transects, both numbered (and therefore used previously) and unmarked, with each active crevice being recorded and marked if new. It was first noted in 2013 how some marked crevices no longer

fell within the two metre wide transects, an observation which prompted regular checks to assess the drift caused by (typically) small scale rock movements (and almost certainly in a small number of cases by erroneous measurements early in the project); it should be noted in future surveys that some marked crevices which were once within the two metre transects now lie outside of the survey area. The playback census this year again focused on the area delineated by marked burrows, although the results were then divided into those which fell within the two metre transects 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 monitored since the project's inception. There was no 2020 survey, the mean that for the period 2010-2019 and 2021-2022.

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	
2023	9	13	17	15	(6)	15†	(8)†	12	(7)	61	(32)	103	(53)	142	(92)
2022	9	18	19	16	(5)	18†	(9)†	17	(10)	57	(32)	108	(56)	154	(102)
2021	9	17	16	17	(5)	15†	(7)†	14	(10)	43	(22)	89	(44)	131	(86)
2019	10	23	12	18	(7)	18†	(9)†	13	(8)	44	(20)	93	(44)	138	(89)
2018	6	13	11‡	15	(5)	15†	(10)†	12	(8)	49	(30)	91	(53)	121	(83)
2017	7	20	15‡	15	(5)	13†	(7)†	10	(9)	47	(27)	85	(48)	127	(90)
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	**7.3**	**14.4**	**16.7**	**13.6**	**5.0**	**15.4**	**8.4**	**12.3**	**8.3**	**41.2**	**23.3**	**81.2**	**44.2**	**119.4**	**82.4**

* Transect 1 was only visited on four occasions in 2016 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 in October 2017.

Between 31 and 56 responses were elicited along the Quarry transects using MP3 playback in each of the years between 2010 and 2019 and in 2021 and 2022, although a substantial rock slide in 2016 significantly reduced the area which could be surveyed that year; Quarry transect two, which held between four and 12 responding birds, was almost entirely destroyed in 2016 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 35 years. Visits to the Quarry in 2017 established that there had been no further significant slides on any of the transects; the decision was made to reinstate transect one entirely and to use the upper section of transect two, a situation which has remained the same since. It was decided in 2017 that all of the data previously collected for transects one and two would be compared directly with future years; no adjustments have thus been made for the fact that transect two was shorter from 2017 onwards and that transects one and two were missed in 2016. Although it was again apparent that there had been some small winter rock slides, again along transect four, there were no safety concerns this year.

There is a general consensus that the number of pairs utilising the 18th 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. However standardised survey work over the last 13 years suggests that there have been no further declines, although clearly there is some variation in the number of responses elicited each year (perhaps in part due to fluctuations in the number of transient, non-breeding birds, rather than changes in the number of breeding pairs (Brown and Eagle, 2017)). This year saw 18.5% fewer wall responses than in 2022, however a combined North Pond Wall and Little Bay Wall total of 22 matched the 2010-2022 mean (21.7 ±sd 6.4); there were highs of 33 in 2019 and 27 in 2017 and 2022, lows of 12 in 2011 and 13 in 2010. It would seem that the Walls population can still be cautiously regarded as stable. The six holes excavated by hand in 2021 and 2022 were not used.

The huge swell generated by Storm Ophelia in October 2017, the remnants of the easternmost major Atlantic hurricane on record, caused yet another scouring event in North Haven Gully. Nest boxes installed 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 were all destroyed, whilst the painted marker stones were again moved from their original locations. This was the third major change to the North Haven landscape in five years, a series of events which almost certainly contributed to a 38.9% decline in the number of occupied crevices located between 2010 and 2018. No further significant changes to the North Haven landscape have been observed since, although a small rock fall above the upper east portion of the gully has created additional sites. Nevertheless, recent weather events releasing soil from further up the gully have seemingly reduced the overall number of open fissures suitable for nesting. How such a loss of available nest sites effects the Skokholm population as a whole is unclear; it would seem likely that nest sites are available away from North Haven and that the birds were not impacted directly (as they were predominantly absent during the scouring events), however the impact of looking for new nest sites on adult survival and productivity is something of an unknown. There were 17 active sites discovered in North Haven Gully this year, this two fewer than last year but matching a 2010-2022 mean of 16.7 ±sd 3.4 and matching the 2015 and 2016 totals as the second highest since the 22 of 2013 (the first big scouring event during this study was in the winter of 2013-2014).

The ephemeral nature of Storm Petrel nest sites was also evident at the Quarry where there were further small scale movements, particularly along transect four. A transect one total of six was one

up on both that of last year and the 2010-2022 mean (there have been five transect responses in nine of 12 years). A transect two total of eight was one down on that of 2022 but matched the mean (8.4 ±sd 2.0), this despite the fact that the transect was shortened in 2017. A transect three total of seven was three down on that of last year and matched those of 2013 and 2015 as the lowest since the five of 2012 (the 2010-2022 mean is 8.3 ±sd 1.8). The 32 responses elicited within the two metre wide transect four over ten visits matched the record total logged last year; the previous highs were the 27 of 2013 and 2017 and the 30 of 2018, whilst the 2010-2022 mean is only 23.3 ±sd 5.5. The overall Quarry total of 53 was three down on that of last year but matched that of 2018 as the second highest on record, this 19.9% up on the 2010-2022 mean (44.2 ±sd 7.2).

The number of crevices which have at some point been occupied over the 13 study years (a total of 394), 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. Crevices in the lower half of transect two, not visited after the 2016 rock fall, are not included in this table.

	Quarry Transects	The Walls	North Haven Gully	Total	% of total
1 year of apparent occupancy	53	41	23	**117**	29.70
2 years of apparent occupancy	34	9	22	**65**	16.50
3 years of apparent occupancy	24	8	9	**41**	10.40
4 years of apparent occupancy	22	6	13	**41**	10.40
5 years of apparent occupancy	23	5	1	**29**	7.36
6 years of apparent occupancy	14	7	5	**26**	6.60
7 years of apparent occupancy	9	5	2	**16**	4.06
8 years of apparent occupancy	18	1		**19**	4.82
9 years of apparent occupancy	10	1	1	**12**	3.05
10 years of apparent occupancy	6	1		**7**	1.78
11 years of apparent occupancy	10	3		**13**	3.30
12 years of apparent occupancy	2			**2**	0.51
13 years of apparent occupancy	4	1	1	**6**	1.52
Total	**229**	**88**	**77**	**394**	

Overall there were 92 responses elicited this year, this ten fewer than logged in a record 2022 (there were two fewer active sites in North Haven, five fewer in Little Bay Wall and three fewer in the Quarry); nevertheless the total was the second highest on record, up on the 91 of 2013, the 90 of 2017 and a 2010-2022 mean of 82.5 ±sd 10.9. It still seems likely that, over the last decade at least, the Skokholm study population has been stable at worst, 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). One of the most important variables highlighted in recent years is nest site availability within the study areas; birds can only react to the changing landscape and maintain a stable population if further nest sites open up as others are lost. It is clear that some Storm Petrel nest crevices are short lived (as shown in the table above, nearly a third of those found over the course of this study have only been occupied during a single year), however stable sites are also in existence; over 25% of the active crevices located during 13 years of study have shown signs of occupancy in six or more years and 7.11% of crevices have contained a calling bird in ten or more years. Although changes in the positioning of rocks will mean that some crevices were only available for a single year, it is tempting to suggest that some of the crevices occupied only once are perhaps unsuitable nest sites (although they contained a calling bird, such sites may have never actually supported a breeding attempt).

The proportion of known active crevices which respond to a recording of male song during any single visit unsurprisingly fluctuates; there are several reasons for this, including the chance presence of birds of different sexes, individual variation in response rate, nest site positioning (which will

influence how occupants hear the stimulus) and breeding status (non-breeders are perhaps more likely to leave a crevice unattended, to occupy multiple crevices during the study period or to respond at a different rate to breeding birds, whilst breeding status could also change during the survey period). The Walls saw an average of 6.9 (31.4%) of the 22 active sites respond per visit, although between three and 14 responded on a single visit. At North Haven a mean of 6.3 (37.1%) of 17 active sites responded, although between two and 11 responded on a single visit. At the Quarry a mean of 35.5 (34.5%) of 103 active sites responded, but this was between 20 and 50 on any particular date. Despite this significant variation between dates, the mean response rates at the Walls, North Haven and the Quarry fell within the ranges observed between 2014 and 2022 (see table below). An average response rate for all sites of 34.3% was the second highest to be observed in nine years, only down on the 36.7% recorded last year; although it is unclear why, the three highest average response rates have occurred in the last three years and the five highest in the last five years. The use of these 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). Based on the data collected over nine of the last ten years, the number of active sites present in an area is likely to be in the region of 3.23 times more than the number encountered on a single visit. However the variation seen in this year's figures is a reminder of how difficult it is to assess the 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 ten visits, and the 2014-2023 mean (the resulting correction factors are given in parenthesis).

Year	The Walls	North Haven	Quarry	Rock fall	Average
2023	31.4 (3.19)	37.1 (2.70)	34.5 (2.90)	34.8 (2.87)	34.3 (2.92)
2022	29.6 (3.38)	40.0 (2.50)	37.9 (2.64)	38.2 (2.62)	36.7 (2.73)
2021	34.2 (2.92)	36.9 (2.71)	32.1 (3.11)	32.9 (3.04)	33.1 (3.02)
2019	31.2 (3.20)	35.8 (2.79)	30.1 (3.23)	30.8 (3.24)	30.9 (3.24)
2018	22.6 (4.42)	31.8 (3.14)	32.6 (3.06)	32.5 (3.07)	31.0 (3.23)
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)
Mean	**30.6 (3.26)**	**35.1 (2.85)**	**30.4 (3.29)**	**30.9 (3.23)**	**31.0 (3.23)**

A summary of Petrel Station contents 2018-2023

	2018	2019	2020	2021	2022	2023
Number of pairs that produced eggs	4	9	8	5	6	7
Number of pairs that fledged young	0	2	2	3	4	5
Productivity	0.00	0.22	0.25	0.60	0.67	0.71
Boxes with signs of occupancy	8	13	12	19	58	64

There is a clear need to discover what the birds which respond to playback during the annual monitoring are actually doing; due to the fact that the vast majority of responding birds are hidden, it is unclear how many of these (and indeed how many of the 2383 occupied sites predicted during the 2016 whole Island census (Wood *et al.*, 2022)) are actually breeding (as opposed to non-breeders moving around potential nest sites or diurnal refuges unsuitable for nesting). Previous attempts to use an endoscope in natural sites have failed to locate a sufficiently large sample size for monitoring purposes. One way to improve our knowledge is to encourage petrels to occupy accessible artificial 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 added in April 2017). Ten

visits were made to this 'Petrel Station' between 26th June and 11th July 2020 when an MP3 playback census was conducted (this within the standard period used for the transect survey). The ten visits elicited calls from just three boxes, with a mean of 1.1 responses per visit and a mean apparent response rate of 36.67%. Confirmatory checks during the chick provisioning period revealed discrepancies between the playback results and the box contents; two of the boxes found to be active during the survey contained chicks, but one only contained a nest scrape, whilst a further three boxes from which responses were not elicited contained nest scrapes and six additional boxes contained egg stage failures by silent pairs. This has obvious implications for the whole Island census as evidently some active sites were not detected over ten visits (which would perhaps suggest that the Skokholm population is larger than estimated in 2016). It should be remembered that the Petrel Station was probably not then representative of the Island as a whole, primarily as the majority of occupants were likely to be younger, inexperienced birds. This theory is supported by the 2018-2020 productivity estimates (see table above), these figures well down on those seen elsewhere on the Island. Given the poor productivity witnessed early in this project, it was decided that there would be no Petrel Station playback census in 2021, 2022 or 2023 (to allow for productivity checks in years without a potentially disturbing survey).

Visits to the Petrel Station during the 2023 chick provisioning period revealed that 64 boxes had contained a Storm Petrel at some point this year, this six more than last year and a new high. Only nest scrapes were present in 57 of these boxes, with seven pairs having produced eggs. An egg in box 21 was abandoned (there was a nest scrape in this box last year and no signs of occupation previously), as was an egg in box 104 (this site was seemingly occupied for the first time last year when a chick died during hatching). Chicks fledged from boxes 11 and 64 for a fifth consecutive year and a chick fledged from box 12 for a third consecutive year. A chick fledged from box 63 for the first time; this site held an egg stage failure in 2018 and was not seemingly occupied from 2019 to 2022. A chick also fledged box 112 for the first time; this site held egg stage failures in 2019 and 2020, was seemingly empty in 2021 and contained an empty scrape last year. Assuming that no eggs had been removed from the Petrel Station by the petrels or scavengers (a difficult task as there is a lip between the nest chamber and the access tunnel to each box), then productivity was 0.71 fledglings per pair, this a new high for this site and more consistent with that observed elsewhere. It is unclear whether the improved productivity seen since 2021 is due to reduced disturbance or the fact that this site may now contain older, more experienced birds. Eight cameras were installed in the Petrel Station this year, four of these in boxes 11, 12, 64 and 112. The cameras again captured courtship and mating, egg laying, incubation and chick feeding, along with some fascinating pebble tossing behaviour (the latter seen in both adults and chicks). An increasing number of Petrel Station

fledglings was sufficient inspiration for a Petrel Station II which was built near the Farm, this containing 148 accessible nest chambers (above photographs).

There were 25 sites discovered this season where an incubating bird was evident early enough in the nesting period to allow for a productivity estimate, these including the four Petrel Station cameras listed above (the largest sample this decade had been 20, with a 2014-2022 mean of 17.6). Although some very 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. The first eggshell fragments indicative of a hatched chick were discovered along Quarry Transect two on 5th July, this two days earlier than the 2015-2022 mean (the earliest chick during this period was discovered on 29th June 2019 and the latest on 26th July 2021). Only five of the monitored nest attempts failed; attempts in the Gantry Wall, under a rock in the Quarry and in Quarry box A2 failed at either egg or very small chick stage (the nest contents were not found), an egg in Quarry box A5 was abandoned and a smashed egg was found in Quarry box B8. The remaining 20 attempts were successful, the 2023 productivity estimate thus being 0.80 fledglings per pair; although down on the 0.85 of last year, this matches that of 2021 as the second highest estimate of the last decade (the 2014-2022 mean is 0.63 ±se 0.05, with a low of 0.45 in 2020). It is unclear why productivity was so high during the last three years, although predominantly dry conditions no doubt benefitted small chicks left alone in relatively exposed sites.

Although only small numbers of accessible chicks are ringed each year on Skokholm, the tape luring of adult birds in South Haven is giving some indication as to their post-fledging survival (this coupled with a small number of controls from elsewhere). Of four birds ringed as chicks in 2013, one has been found subsequently (25.0%), whilst three of 11 2014 chicks (27.3%), four of 17 2015 chicks (23.5%), one of six 2016 chicks (16.7%), one of seven 2017 chicks (14.3%), two of 15 2018 chicks (13.3%), five of 24 2019 chicks (20.8%), three of 15 2020 chicks (20.0%) and five of 42 2021 chicks (11.9%) have been encountered again (the controls being a 2015 chick retrapped in Cornwall in 2018 and again in France in 2021, a 2016 chick retrapped on the nearby mainland in 2019, a 2018 chick retrapped in Cornwall and then Wexford in 2021, a 2021 chick retrapped in Gwynedd this year and a 2021 chick retrapped in Donegal this year). Thus, of the 99 Storm Petrel ringed as chicks between 2013 and 2020, 20.2% have been seen again. Of the 25 youngsters now encountered subsequently,

15 were first found two summers after fledging (including one also seen three summers after), nine were first found three summers after fledging (including one also seen six summers after and one also seen four and seven summers after) and one was first found four summers after fledging. Four ringed in the Petrel Station have been seen again, this including the chicks ringed in box 11 in 2019, 2020 and 2021, all potentially siblings and encountered in South Haven this July.

In 2013 a thermal imaging camera recorded a Short-eared Owl hunting Storm Petrels in the Quarry, an event which has subsequently been shown to be quite regular. The remains of six petrels were found that year, with 16 in 2014, 18 in 2015, 51 in 2016, 98 in 2017 (the only year on record in which Short-eared Owls have been proven to breed), 31 in 2018, five in 2019, three in 2020, 39 in 2021 and five last year; the majority of these were thought to be the victims of Short-eared Owls, usually due to the presence of feathers or pellets. There were 20 Short-eared Owl bird-days logged this season, this matching the fourth lowest total of the last 11 years and down on a 2013-2022 mean of 33.7 (there was a high of 76 in 2017 and a low of 16 in 2020). The remains of eight adult Storm Petrels were located this year, all between 22nd June and 10th September; between 2013 and 2022 there was an annual mean of 27.2 ±sd 29.7 dead birds logged (see above). There were again no Little Owl records (the last was seen on 17th March 2018); this introduced species is a well-documented Storm Petrel predator, for example the 1936 Skokholm Bird Observatory Report includes details of a Little Owl nest containing the remains of nearly 200 petrels. In 2019 a House Mouse was watched via a live infrared camera feed as it entered Petrel Station burrow 64; it was seen to walk to the end of the entrance tunnel but did not drop down into the chamber or interact with the resident Storm Petrel chick, indeed neither seemingly reacted to the other's presence. There is as yet no evidence that the Skokholm mice take eggs or chicks, even those abandoned following failed nest attempts.

Adult Storm Petrels were lured to the traditional South Haven netting site on 16 nights between 17th July and 4th September; this was nine more nights than last year (when ringing was suspended due to HPAI concerns) and five more nights than the 2013-2022 mean, indeed it was more nights than in any other year during this period (although the six nights from 20th August yielded only 27 new birds, a retrap and a control). The largest catch was of only 74 birds on the night of 17th July; this was the lowest peak catch of the last 11 years (the previous low being the 101 of 2013), 193 down on the record of 267 set in 2022 and well down on the mean (190.2 ±sd 57.3). Subsequent catches were smaller still, with peaks of 56 on the night of 18th July, 51 on the night of the 19th and 55 on the night of the 25th. There were 379 adults handled in South Haven this year, this the lowest total of the last decade and down on a 2013-2022 mean of 722.4 (there were highs of 1063 in 2018 and 1284 in

2021). Of those handled, 8.4% were already wearing a ring (the mean during the period 2013-2022 was 11.1%, with a high of 21.3% in 2021 and a low of 5.4% in 2014); these included two ringed as adults in 2021, two ringed as adults in 2022, one ringed as an adult this year and six ringed as chicks (one in 2019, two in 2020 and three in 2021), whilst 21 (5.54%) had been ringed elsewhere (the mean during the same period was 4.07%, with a high of 5.68% in 2013 and a low of 2.58% last year). Since ringing fully recommenced in 2013 we have now received news of 542 Storm Petrels either ringed on Skokholm and found elsewhere or ringed elsewhere and controlled on Skokholm; of these 353 have been exchanged with sites more than 10km away from the Island (see map below). Unless stated otherwise, all of the following recoveries were of birds deliberately mist netted.

Ringing recovery 2186282
Originally ringed as an adult, SKINNINGROVE, REDCAR & CLEVELAND 20th July 2023
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 20th August 2023
Distance travelled 432km at 223 degrees (SW)
Days since ringed 31
Only the seventh 21st century encounter with a bird ringed on the east coast of England. A Skokholm ringed bird is yet to be found on that side of the country.

Ringing recovery 2547865
Originally ringed as an adult, GREAT SALTEE ISLAND, WEXFORD, IRELAND 15th June 2023
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 18th July 2023
Distance travelled 102km at 119 degrees (ESE)
Days since ringed 33
2547885, ringed as an adult on 16th June 2023, made the same journey, also reaching Skokholm on 18th July but after 32 days.

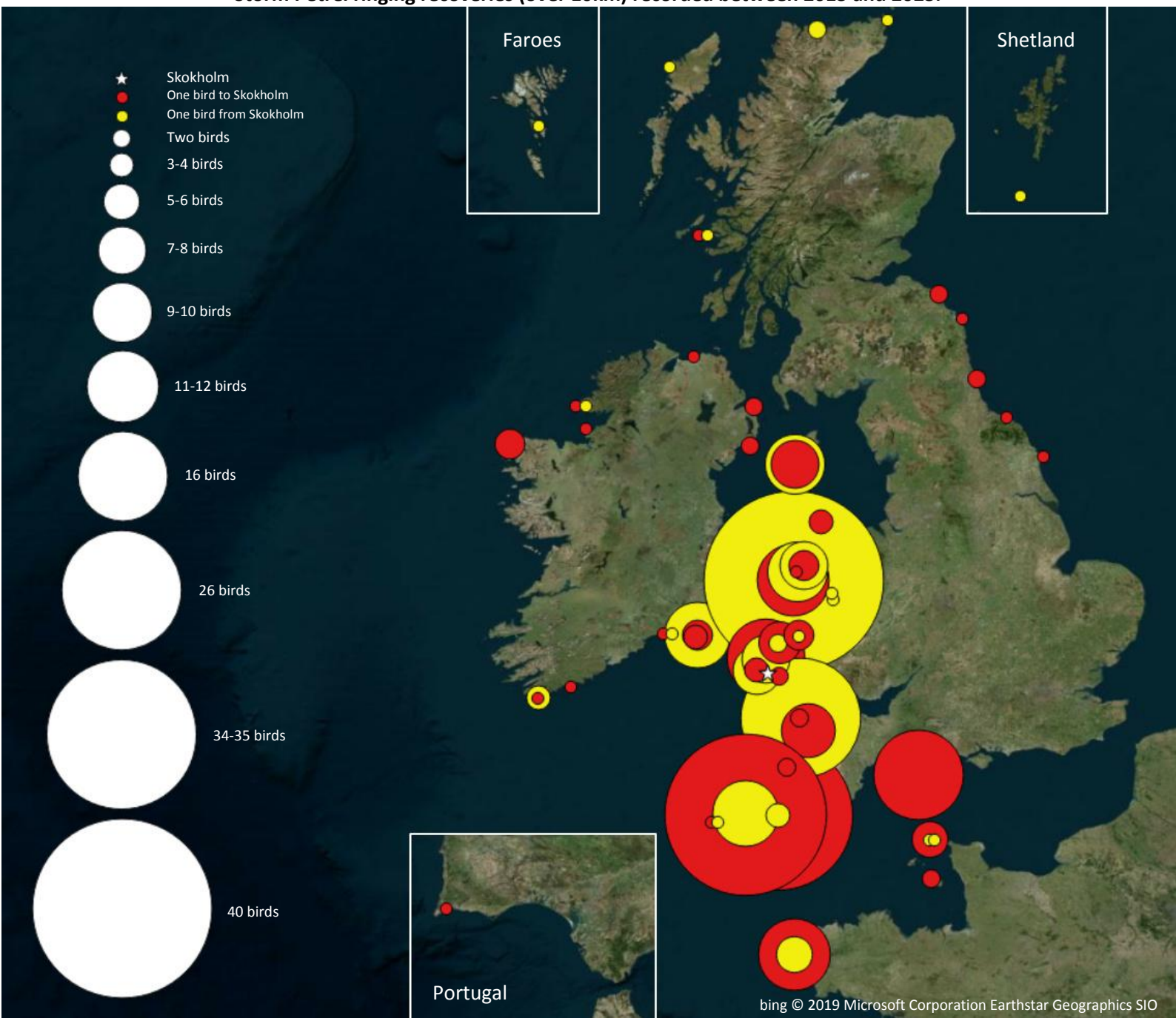
Ringing recovery 2566574
Originally ringed as an adult, GWENNAP HEAD, PORTHGWARRA, CORNWALL 13th July 2002
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 21st July 2023
Distance travelled 187km at 9 degrees (N)
Days since ringed 7678
This was the oldest Storm Petrel encountered during the 2023 season. Additionally 2761201 and 2780591, ringed as adults at Gwennap Head on 7th June 2021 and 4th July 2022, were both in South Haven on 18th July 2023 after 771 and 379 days respectively. 2780599 and 2780665, ringed as adults at Gwennap Head on the 4th and 28th July 2022, were in South Haven on the 7th and 15th August 2023 after 399 and 383 days respectively. 2780684, 2780696 and 2780766, ringed as adults at Gwennap Head on the 15th, the 15th and 18th June 2023, were in South Haven on the 19th, the 26th and 19th July after 34, 41 and 31 days respectively. 2774544 made the reverse journey; having been ringed as an adult in South Haven on 20th July 2022, it was controlled at Gwennap Head on 18th July 2023 after 363 days.

Ringing recovery 2587602
Originally ringed as a juvenile, FRESHWATER WEST, PEMBROKESHIRE 26th October 2019
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 19th July 2023
Distance travelled 17km at 290 degrees (WNW)
Days since ringed 1362
Yet more evidence that wayward youngsters released back to sea can go on to survive. This is the second Storm Petrel in four years to be encountered following a release at this site.

Ringing recovery 2649657
Originally ringed as an adult, PORTH IAGO, LLŶN PENINSULA, GWYNEDD 24th June 2020
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 18th July 2023

Distance travelled 133km at 197 degrees (SSW)
Days since ringed 1119

Storm Petrel ringing recoveries (over 10km) recorded between 2013 and 2023.



Ringing recovery 2685475
Originally ringed as an adult, SOUTH HAVEN, SKOKHOLM 20th July 2014
Recovered as an adult, LUNDY ISLAND, DEVON 19th July 2023
Distance travelled 69km at 142 degrees (SE)
Days since ringed 3286
Additionally 2685534 and 2685757, ringed as adults in South Haven on the 20th and 24th July 2014, were controlled at Lundy on the 25th and 16th July 2023 after 3292 and 3279 days respectively. 2705497, ringed as an adult in South Haven on 31st July 2015, was controlled at Lundy on 17th August 2023 after 2939 days. 2722660, ringed as an adult in South Haven on 8th August 2017, was controlled

at Lundy on the 10th and 23rd July 2023 after 2162 and 2175 days. 2740238, ringed as an adult in South Haven on 19th July 2018 and controlled at Lundy on 1st September 2018, was again there on the 19th and 24th July 2023 after 1826 and 1831 days. 2740568, ringed as an adult in South Haven on 4th August 2018, was controlled at Lundy on 6th August 2023 after 1828 days. 2746782 and 2746817, both ringed as adults in South Haven on 13th July 2020, were controlled at Lundy on 16th July and 28th August 2023 after 1098 and 1141 days respectively. 2746895, ringed as an adult in South Haven on 17th July 2020, was controlled at Lundy on 17th August and 16th September 2023 after 1126 and 1156 days. 2758118, 2758120 and 2758755, ringed as adults in South Haven on the 31st, 31st and 18th July 2021, were controlled at Lundy on 20th July, 10th July and 16th August 2023 after 719, 709 and 759 days respectively. 2774192 and 2774446, ringed as adults in South Haven on the 12th and 17th July 2022, were controlled at Lundy on 20th July and 16th August 2023 after 373 and 395 days respectively. 2775076 and 2775094 made the reverse journey; having been ringed as adults at Lundy on the 19th and 20th July 2023, they were controlled in South Haven on 17th August and 26th July after 29 and six days respectively.

Ringing recovery 2685726
Originally ringed as an adult, SOUTH HAVEN, SKOKHOLM 24th July 2014
Previously recovered as an adult, BARDSEY ISLAND, GWYNEDD 28th June 2016
Recovered as an adult, BARDSEY ISLAND, GWYNEDD 9th August 2023
Distance travelled 125km at 16 degrees (NNE)
Days since ringed 3303
Additionally 2774127, ringed as a large chick along Quarry Transect Four on 5th September 2021, was controlled at Bardsey on 9th July 2023 after 672 days. 2773191 made the reverse journey; having been ringed as an adult at Bardsey on 28th July 2022, it was controlled in South Haven on 19th July 2023 after 356 days. Whilst the majority of Storm Petrels controlled on Skokholm have been ringed to our south, primarily in Cornwall and Dorset, the majority of birds ringed on Skokholm are controlled to our north. Skokholm ringed birds have now been controlled at Bardsey Island on 40 occasions since 2013, with 26 at Lundy, ten at Little Saltee and Gwennap Head and nine at Porth Iago and the Calf of Man the next highest tallies.

Ringing recovery 2722782
Originally ringed as an adult, SOUTH HAVEN, SKOKHOLM 24th August 2017
Recovered as an adult, FAIR ISLE, SHETLAND 16th August 2023
Distance travelled 902km at 15 degrees (NNE)
Days since ringed 2183
The first 21st century bird to be found on Shetland.

Ringing recovery 2724168
Originally ringed as an adult, SKOMER ISLAND, PEMBROKESHIRE 23rd July 2022
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 19th July 2023
Distance travelled 4km at 163 degrees (SSE)
Days since ringed 361
There were 25 Skomer ringed birds encountered on Skokholm between 2013 and 2022, along with 55 Skokholm ringed birds found on Skomer, however this was the sole exchange reported this year.

Ringing recovery 2739409
Originally ringed as an adult, STRUMBLE HEAD, PEMBROKESHIRE 17th July 2023
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 19th July 2023
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 7th August 2023
Distance travelled 40km at 202 degrees (SSW)
Days since ringed 2 and 21
2774206 and 2774825 made the reverse journey; having been ringed as adults in South Haven on

22nd July 2022 and 19th July 2023, they were controlled at Strumble Head on 23rd June and 26th July 2023 after 336 and seven days respectively.

Ringing recovery 2746296
Originally ringed as an adult, SOUTH HAVEN, SKOKHOLM 27th July 2019
Previously recovered as an adult, LUNGA, TRESHNISH ISLES, ARGYLL & BUTE 2nd July 2021
Recovered as an adult, CALF OF MAN, ISLE OF MAN 29th June 2023
Distance travelled 263km at 8 degrees (N)
Days since ringed 1433

Ringing recovery 2758936
Originally ringed as an adult, SOUTH HAVEN, SKOKHOLM 27th July 2021
Recovered as an adult, ILE DE BANNEG, LE CONQUET, FINISTÉRE, FRANCE 25th June 2022 (sic)
Distance travelled 364km at 178 degrees (S)
Days since ringed 333
Additionally 2774507, ringed as an adult in South Haven on 19th July 2022, was controlled at Ile De Banneg on 3rd August 2022 (sic) after 15 days. FRP SE39284 and FRP SE42550 made the reverse journey; having been ringed as adults at Ile De Banneg on 11th June and 8th July 2021, they were controlled in South Haven on the 4th and 2nd August 2021 (sic) after 54 and 25 days respectively. FRP SE45101 also made the reverse journey; having been ringed as an adult at Ile De Banneg on 3rd August 2022, it was in South Haven on 18th July 2023 after 349 days. The commune of Le Conquet is home to Banneg, the largest Storm Petrel colony in France, an island believed to support just under 1000 pairs which primarily nest in abandoned Rabbit burrows. Interestingly this nesting habitat was not found to be in use on Skokholm during the 2016 whole Island census (although in 2019 birds were found calling from a small area of burrows to the west of Dip Gully). There have now been 11 Banneg ringed individuals found on Skokholm since 2013, whilst five Skokholm ringed birds have been found there.

Ringing recovery 2774131
Originally ringed as a large chick, FRANK'S POINT, SKOKHOLM 6th September 2021

Recovered as an adult, MALIN BEG, GLEANN CHOLM CILLE, DONEGAL, IRELAND 5th August 2023
Distance travelled 404km at 325 degrees (NW)
Days since ringed 698

Ringing recovery 2774652
Originally ringed as an adult, SOUTH HAVEN, SKOKHOLM 18th July 2023
Recovered as an adult, HOUMET HERBE, ALDERNEY, CHANNEL ISLANDS 15th August 2023
Distance travelled 310km at 135 degrees (SE)
Days since ringed 28

Ringing recovery CIJ P19472
Originally ringed as an adult, BURHOU ISLAND, ALDERNEY, CHANNEL ISLANDS 14th July 2023
Recovered as an adult, SOUTH HAVEN, SKOKHOLM 16th August 2023
Distance travelled 305km at 316 degrees (NW)
Days since ringed 33

Fulmar *Fulmarus glacialis* **Aderyn-drycin y Graig**
Fairly Common Breeder first bred in 1967
3 pulli trapped
1968-1976: 19 trapped, 2017-2021: 6 pulli trapped

Although birds were absent from the cliffs on both the 1st and 2nd March, Fulmar were ashore on each subsequent March date; birds were absent from the cliffs on an average of 2.6 March dates between 2016 and 2022 (with some birds ashore on every date in 2021 and birds absent on six dates last year). A 16th to 31st March daycount mean of 70.5 was up on a 2013-2022 mean of 60.3 (indeed it was only down on the 85.0 of 2018 and the 78.7 of 2021), whilst a peak March daycount of 209 on the 7th was only down on the 216 of 2016 and the 264 of 2021. Although there were eight April daycounts of 70 or less, including lows of 40 on the 12th (when no birds were ashore), 30 on the 16th and 43 on the 20th, eight three-figure daycounts took the April bird-days total to 2602 (this close to a 2013-2022 mean of 2517.9). No more than 59 were logged each day between the 2nd and 16th May, this pre-laying exodus mirroring that seen in recent years (there were lows of 28 on the 3rd and 25 on the 8th, with daycounts increasing to 88 on the 17th, 106 on the 19th and 139 on the 20th). The first egg to be seen was on Little Bay Point on 16th May, this two days later than the first of last year but matching those of 2019, 2020 and 2021 as the second earliest of the last 11 years; the 2013-2022 first egg mean is 19th May, with the latest during this period logged on the 28th in 2014 (following prolonged and severe storms during the preceding winter).

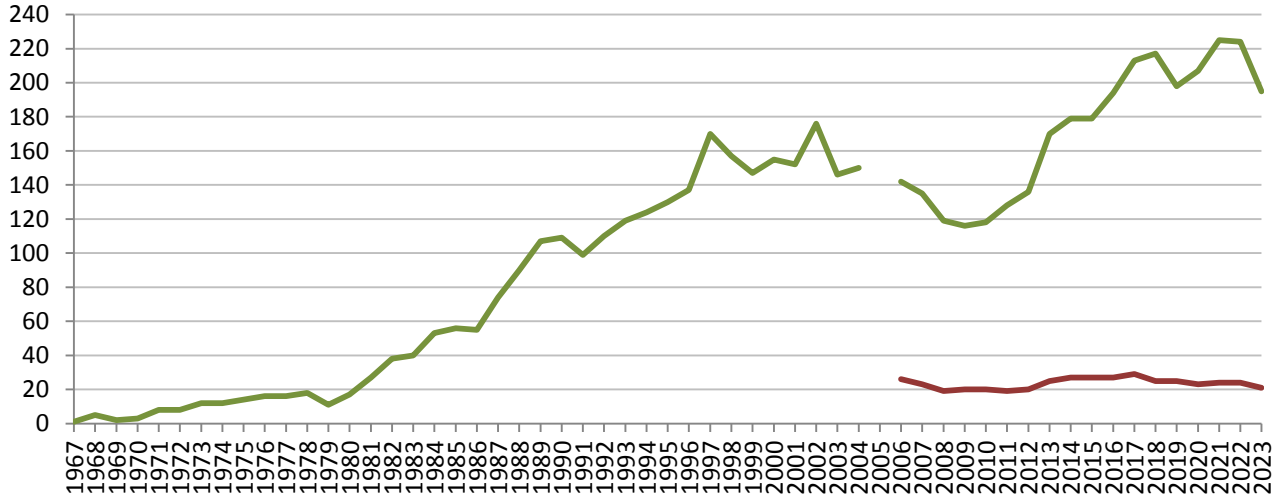
The six study plots counted annually since 2006 were visited on ten dates between 29th May and 9th June, an entirely dry period during which predominantly light winds blew entirely from the easterly quarter; some survey periods are far less clement, for example the 2020 and 2021 seasons saw May storms and huge seas which inevitably influenced Fulmar ledge attendance (the standard deviation recorded across ten visits being higher in rougher years (see below)). A 2023 average of 21 apparently occupied sites was the lowest since the 20 of 2012, eight down on the 2017 record and down on both a 2013-2022 mean of 25.60 ±sd 1.84 and a 2006-2022 mean of 23.71 ±sd 3.14. The mean total at Little Bay was again 12, this a plot where the number of occupied ledges has declined from a high of 19 in 2013 to 18 in 2014 and 2017, 17 in 2015, 16 in 2016, 14 between 2018 and 2020, 13 in 2021 and 12 last year; although 2019 saw one of the lowest plot averages, it was the year in which the area which contains this plot saw the highest number of apparently occupied sites (see map below), whilst this year the count for this area mirrored the plot (with the lowest total of the last decade). The Guillemot Cliff mean remained at five, this matching that logged in all but one year between 2014 and 2022. The Middlerock mean dropped to five, this matching the 2015, 2017 and 2020 totals as the lowest since the four of 2014. Up until the 2017 season, only these three plots

had contained Fulmar, however a hollow in the top third of the North Gully auk colony was occasionally occupied in three of the years between 2017 and 2020 (the overall mean was only changed in 2017); Fulmar were again absent from the North Gully plot this year.

The whole Island totals (apparently occupied sites), mean plot totals, the range of totals over ten study plot visits, the standard deviation observed over the ten visits and the percentage of the Island total made up of study plot birds 2013-2023.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Island	170	179	179	194	213	217	198	207	225	224	195
Plots	25	27	27	27	29	25	25	23	24	24	21
Range	22-28	23-29	26-29	25-29	26-31	23-27	23-27	19-27	21-27	20-27	20-24
±SD	2.07	1.79	1.14	1.26	2.00	1.26	1.35	2.27	1.90	2.10	1.26
Plot %	14.7	15.1	15.1	13.9	13.6	11.5	12.6	11.1	10.7	10.7	10.8

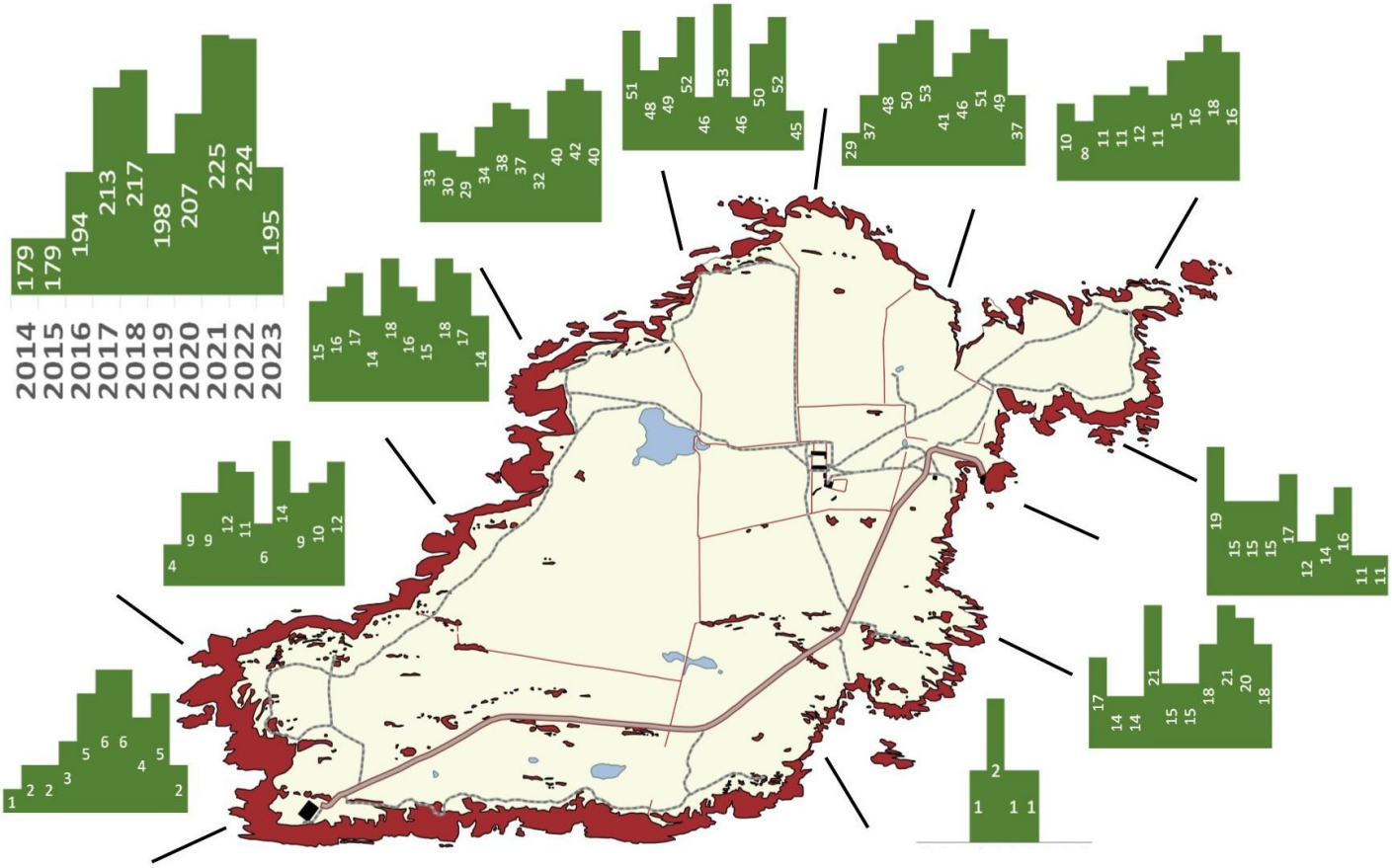
The total number of apparently occupied Fulmar sites recorded on Skokholm since breeding began in 1967 and the number within the study plots since 2006.



The whole Island counts undertaken between 29th May and 11th June yielded an average of 195 apparently occupied sites, this the lowest total since the 194 of 2016 and 2.8% down on a 2013-2022

mean of 200.60 ±sd 19.79; this was only the ninth time on record in which the total has been down on the mean of the preceding decade, with the same occurring in 2003 and annually between 2006 and 2012. There was a decline in numbers in all bar two of the occupied coastal sections, with the Peter's Bay mean matching that of last year as the lowest for more than a decade (this perhaps in some way connected to the poor productivity commonly recorded in this area (see below)) and two more apparently occupied sites between Wardens' Rest and the Bluffs (the total matching that of 2017 as the second highest to date). The declines were of three in the vicinity of the Quarry (-60%), three between Purple Cove and Twinlet (-18%), two between the Dents and the Jogs (-5%), seven between Little Bay and Little Bay Point (-13%), 12 between Far and Smith's Bays (-24%), two to the north of the Neck (-11%) and two in Hog Bay (-10%). The 2023 whole Island count includes approximately 30 pairs which would be difficult or impossible to see from the Island itself (birds seen from a boat to the west of North Gully, in Little Bay, on the Little Neck and in hidden crevices between Smith's 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 was 10.8% this year; this is 16.3% down on the 2013-2022 mean (12.9% ±sd 1.8), almost matched the lowest recorded since the plots were begun (the 10.7% of 2021 and 2022) and is probably an indication that the plots are not representative of the Island as a whole (perhaps due to a lack of space for expansion, although up to eight more pairs have been resident in the Little Bay plot previously). The plots are nevertheless useful as they give an indication as to how the number of occupied ledges varies during the whole Island count period; they thus serve as a reminder that the population could be somewhat different to that deduced during a comparatively low number of visits.

The distribution of apparently occupied Fulmar sites 2014-2023.



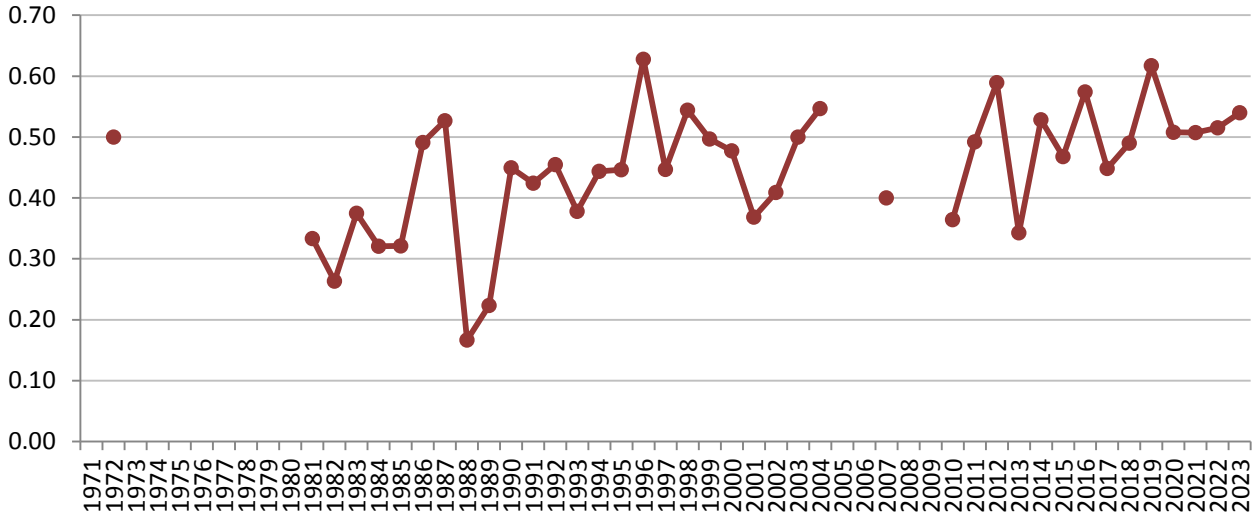
From 16th May, 63 incubating adults were selected for productivity monitoring (eight at Twinlet, 12 at North Gully and the Dents, 17 in Little Bay, 13 on Little Bay Point, five at Rat Bay and eight at

Peter's Bay); birds seen with eggs or those apparently incubating for ten consecutive days were included in the sample (thus more birds were initially monitored but were soon discovered not to be incubating). Unusually no failures became apparent during the first ten days of incubation, whilst three attempts failed within three weeks, six failed within four weeks, one failed after approximately 36 days and two failed within a week of the first chicks hatching; there were thus 12 egg stage failures, with all ledges found empty. An additional 13 failures became apparent at the time when the eggs of neighbouring pairs were hatching, however the nest sites were also found to be empty; none of these sites were seen to contain abandoned eggs, hatched eggshell or dead chicks (the contents were thus removed by either the parents, by other Fulmars visiting abandoned ledges, by predators or by scavengers). A ledge at Little Bay which had held an adult with hatched eggshell was empty four days later. A dead chick seen alone on Middlerock at approximately nine days of age was gone four hours later. There were two large chick failures, with one at Little Bay found alive on a lower ledge, wings broken and covered in oil at approximately 42 days (it was gone the following day) and one dead on its natal ledge at approximately 47 days (it was also missing the following day).

Of the 63 monitored breeding attempts, 34 (53.97%) were successful; a productivity estimate of 0.54 fledglings per pair is 20.0% up on the post-1972 average of 0.45 ±se 0.02 and 8.0% up on a 2013-2022 average of 0.50 ±se 0.02 (although it is down on two of the last ten years). The last ten years have seen productivity above or equal to the long-term average, with a 2013 estimate of 0.34 fledglings per pair the last to fall below the mean. The seventh highest whole Island total of apparently occupied sites, coupled with above average productivity, leads to a predicted 105 Skokholm fledglings in 2023; this matches the sixth highest predicted total to date, down on highs of 122 in 2019 (when there were 198 apparently occupied sites and monitored productivity was 0.62 fledglings per pair) and 115 last year (when there were 224 apparently occupied sites but monitored productivity was only 0.52 fledglings per pair). Poor productivity at Peter's Bay in eight of the years between 2013 and 2022 influenced the overall estimates; Peter's Bay productivity in 2013 was 0.06 (compared with an overall figure of 0.34), in 2014 it was 0.40 (0.53 overall), in 2015 it was 0.18 (0.47 overall), in 2017 it was 0.31 (0.45 overall), in 2018 it was 0.36 (0.49 overall), in 2020 it was 0.33 (0.51 overall), in 2021 it was 0.30 (0.51 overall) and in 2022 it was 0.44 (0.52 overall). The 2016 season saw 0.54 fledglings per pair, a total virtually identical to the overall value of 0.57, and 2019 saw 0.60 fledglings per pair, a total virtually identical to the overall value of 0.62. The reason for this near annual discrepancy is still unclear, as is what linked the more successful 2016 and 2019 seasons; neither environmental factors, predation pressure nor the behaviour of the birds themselves have been obviously different at this site. Six of the eight pairs monitored at Peter's Bay failed this year, at least five of which failed at egg stage; a productivity value of 0.25 fledglings per pair was the lowest

recorded at any of the monitored bays (productivity was 0.33 at North Gully, 0.46 at Little Bay Point, 0.65 at Little Bay, 0.75 at Twinlet and 1.00 at Rat Bay).

Fulmar productivity (total number of fledged young per monitored pair) in each year that it has been calculated between 1972 and 2023. The 1972-2023 mean is 0.45 ±se 0.02 fledglings per pair.



It is likely that the larger Fulmar population of recent years will have affected other species; observations during the last few years have included both adult and young Herring Gulls oiled by nesting Fulmars, adult Fulmars sat on Herring Gull nests, Razorbill adults and chicks evicted from ledges by prospecting birds, an oiled juvenile Peregrine and what was probably a Raven oiled so extensively that it led to the failure of a nest attempt. Intraspecific interactions have also been witnessed; heavily oiled adults are noted on occasion, whilst two chick stage failures and at least two egg stage failures have been attributed to aggressive neighbours (the eggs were lost prior to the whole Island census). There were no similar observations this year. Although Storm Petrels are regularly encountered without feet, and Manx Shearwaters occasionally so, a one-footed adult Fulmar photographed on 12th August was unusual.

The first fledgling of the year had departed its natal ledge at Little Bay Point by 21st August, this one day later than the first two of last year and on the same date as the 2013-2022 first fledgling mean (the earliest during this period had departed on the 18th in 2019 and the latest on the 25th in 2013). The first five study plot fledglings left ledges at Little Bay and Little Bay Point by 22nd August, this one day later than the 2014-2022 mean and on the same date as the firsts of 2021 and 2022. All of the

remaining 29 productivity plot fledglings departed over the following 16 days; the first 25% had fledged by 25th August (one day earlier than the 2014-2022 mean), 50% had departed by 27th August (two days earlier than the 2014-2022 mean) and 75% had departed by 31st August (one day earlier than the 2014-2022 mean). The last had left its Peter's Bay nest by 7th September, although it only reached as far as a lower ledge, a site which it occupied throughout a fogbound 8th and on the morning of the 9th; this matched the 2014-2022 mean (the earliest last plot fledgling during this period had departed by 3rd September in 2017, the latest by 22nd September in 2021). Interestingly the late 2021 fledgling was not wholly the result of a late hatching, indeed it had first been seen as a hatchling on 20th July meaning that it was on its natal ledge for 64 days (this a period typically closer to 51 days). The number of birds around the cliffs again dropped rapidly as the fledglings departed, with September highs of 32 on the 1st and 48 on the 2nd (when 19 rafted off the Neck). The Peter's Bay straggler was the last youngster to be seen ashore, 9th September being three days later than the lasts of 2017 and 2022 but otherwise matching one in 2016 as the third earliest last bird this decade; the latest bird to be seen ashore between 2014 and 2023 was present on the 21st in 2021, with the 2014-2022 mean being 11th September. There were September sightings of birds at sea on six further dates to the 20th, with a high of five on the 13th and no more than two from the 14th.

Seawatching during October produced only singles on the 22nd (a bird very close in at Guillemot Cliff), on the 27th (when one was also ashore at Guillemot Cliff) and on the 30th; an October bird-days total of four was the lowest of the last 11 years, down on a 2013-2022 mean of 43.4 and highs during this period of 185 in 2013 and 79 in 2020. The bird ashore was seemingly the earliest on record; the first seven returning birds were ashore on 6th November last year, whilst the 2013-2022 mean first return date is 7th November (with the earliest during this period present on the 3rd in 2021 and the latest on the 11th in 2015). There were no November records during the first four days of the month and only singles on the 5th, 6th and 7th, whilst sightings on 17 dates from the 9th included highs of 97 on the 17th, 121 on the 18th and 98 on the 23rd which took the bird-days total for the month to 779; the peak November daycount was the second lowest of the last 11 years (the 2013-2022 mean is 182.1, with a high of 283 in 2019), whilst the bird-days total was massively down on recent highs of 2006 in 2019, 2222 in 2020 and 2683 in 2021 (when staff were also present throughout the month). Despite the very early first autumn landfall, it was not until 18th November that 20 birds had been ashore, this nine days later than the 2013-2022 mean (20 had been ashore by the 6th in 2017, but not until the 20th in 2015). In total there were birds ashore on 11 November dates (two fewer than last year), including highs of just 69 on the 18th, 47 on the 27th and 36 on the 29th (although up on last year's November peak of 30, the number of birds ashore was well down on all-time highs of 189 on the 28th in 2019 and 180 on the 19th in 2021). The only sightings during the first three days of December were on the 2nd when four were ashore.

Manx Shearwater *Puffinus puffinus* **Aderyn Drycin Manaw**
Very Abundant Breeder a 2018 census estimated 88,945 pairs (95% CI: 21,892). 2012-13 est. 63,980
2097 trapped (including 118 pulli), 1421 retrapped, 4 controls
1928-1976: 171,509 trapped, 2012-2022: 15,425 trapped, 6852 retrapped, 31 controls

One calling after dark on 9th March was three days later than the first two of last year but otherwise the earliest nocturnal record since singles on 27th February and 4th March 2000. Two were off the Lighthouse the following day when the first Lighthouse burrows were streaked with faeces, whilst the first two eaten birds were found on the 12th (two days later than the first single of last year which is the only earlier Great Black-backed Gull casualty on record). April seawatching produced peak daycounts of 6000 on the 10th, 8657 on the 11th and 20,500 during a moderate southeasterly on the 26th; the latter was only down on an April record 21,600 recorded during Storm Hannah in 2019. Manx Shearwaters were seen to be ousted diurnally by Crab Bay Puffins on four dates during April, whilst heavy rain led to at least one Dip bird being flooded from a burrow on the 24th. An adult found at the Lighthouse on 29th April had foot blistering similar to that typically seen in puffinosised

youngsters. Peak May daycounts of 7474 on the 3rd and 10,400 on the 5th were made during moderate south and east winds; the 2013-2022 mean May peak is 13,581, with a high of 28,200 counted during a southwesterly gale in 2018. June daycounts were all of 3820 or less, these the lowest since 2018 and well down on a mean 2013-2022 maximum of 18,142 (there were highs during this period of 24,750 in 2020 and 72,000 during heavy rain and a near gale in 2019). Seawatching effort intensifies in July, however an increase in the number of birds lingering offshore was at least in part responsible for gale associated daycounts of 39,000 on the 7th and 49,560 on the 14th and a record July high of 50,400 during light northwesterlies on the 31st; the 2013-2022 peak July daycount mean is 21,981, with a previous July high of 45,016 logged in 2018. The following day saw a gentle westerly back to a moderate easterly and a minimum of 72,550 Manx Shearwaters offshore, this only down on an all-time high of 87,520 logged on 20th August 2020 (albeit down on the number present on the Island most days). There were further August highs of 42,680 on the 2nd, 34,880 on the 5th, 43,200 on the 8th and 66,090 on the 12th, with a northwesterly gale on the 5th being the only wind in excess of a force five during these watches.

The number of Manx Shearwaters breeding in the study plots encountered the following year and the number to have been found by 2023 (which were actually alive the following year).

	Birds found the next year		Birds found by 2023	
Birds breeding in 2022	279 of 345	80.87%	279 of 345	80.87%
Birds breeding in 2021	283 of 316	89.56%	287 of 316	90.82%
Birds breeding in 2020	253 of 328	77.13%	273 of 328	83.23%
Birds breeding in 2019	245 of 308	79.55%	260 of 308	84.42%
Birds breeding in 2018	247 of 296	83.45%	272 of 296	91.89%
Birds breeding in 2017	236 of 309	76.38%	254 of 309	82.20%
Birds breeding in 2016	238 of 287	82.93%	268 of 287	93.38%
Birds breeding in 2015	230 of 283	81.27%	248 of 283	87.63%
Birds breeding in 2014	215 of 278	77.34%	241 of 278	86.69%
Birds breeding in 2013	116 of 141	82.27%	126 of 141	89.36%

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 (see map below); all birds encountered within the burrows are ringed. Of 345 breeding adults bearing rings in 2022, 279 were found this year (80.87%); this almost matched a 2014-2022 next-year return mean of 81.10% (only 76.38% of 2017 birds were found in 2018, this following the ravages of Storm Ophelia which destroyed several study burrows, whilst a high of 89.56% of 2021 breeders were recorded last year).

The next-year return rate is not an accurate estimate of survival as there is no searching for marked birds in neighbouring, non-study burrows; the number of birds known to be alive will thus be revised upwards as they are discovered in future years. For example 82.27% of 2013 adults were encountered in 2014, but we now know that at least 89.36% of birds were alive (see table above). This year saw four 2021 breeders encountered which were not logged last year, two which had not been seen since 2020, six which had not been seen since 2019, five which had not been seen since 2018, one which had not been seen since 2017 and two which had not been seen since 2014 (one of which was in the same burrow it occupied nine years previously). Given that we are still encountering birds not logged for up to nine years, it is likely that many of the figures given above will again be revised upwards in the future, the current 2014-2022 corrected annual survival rate mean of 87.74% undoubtedly an underestimate.

There is typically a discrepancy in return rates dependent on the breeding success of the previous year; of 251 birds successful with their 2022 breeding attempt, 211 were found in 2023 (84.06%), whereas only 69 of 94 unsuccessful birds returned (73.40%). Of 65 birds which went missing in 2023, 25 (38.46%) had failed with their 2022 breeding attempt. Assuming that not all of the failures were due to the death of a bird, it could be concluded that some of the missing birds have rather opted for more suitable nesting sites. It was noted in 2017 that Storm Ophelia had caused considerable damage to the Lighthouse Study Plot, a destruction of burrows which no doubt led, at least in part, to the reduced number of recaptures in 2018; although 18 of the missing birds have been found subsequently, the return rate of 2017 breeders remains the lowest of the nine years prior to 2023 (82.20%). Ultimately the study burrows give a better insight into burrow fidelity and show an interesting correlation with the stability of the colony; in the fragile Lighthouse colony ten of 82 marked birds were in the same burrow this year as that in which they bred in 2013 (12.2%), whereas in the more stable Quarry Track and Crab Bay colonies four of 18 birds (22.2%) and 17 of 41 birds (41.5%) were still in their 2013 burrows respectively. The fragile nature of the Lighthouse colony, along with the high density of burrowing birds and occasional storm events, sees the structure of many breeding tunnels change annually; clearly some lose their suitability as nest sites. Of the 23 birds encountered in all 11 years between 2013 and 2023, two have fledged a chick in every year (EY41695 and EY41711 in Crab Bay burrow 8). Of the remaining 21 birds, four have fledged young on 73% of occasions, five have fledged young on 82% of occasions and 12 have fledged young on 91% of occasions; that the vast majority of these birds are exhibiting above average productivity is no doubt reflected in their continued use of the same stable burrows.

There were 14 adults in the Lighthouse Plot which had been ringed as chicks, this taking the total number of individuals ringed as plot chicks and subsequently found in the plots to 21. There were nine additions to this list, however only one of these was breeding; FB46236, which was ringed as a pullus in 2017, failed at egg stage this year. Of the eight non-breeders, two had been ringed in 2015, two in 2016, three in 2017 and one in 2019. Of the 21 returning birds ringed as chicks, 13 have been found to be breeding at some point, with five first found to be breeding after seven years, four after six years and three after five years, whist FB46145 bred successfully in 2021 at just four years of age (two metres from its natal burrow). Of the 13 found breeding between 2019 and this year, eight were successful with their first breeding attempt, a productivity value of 0.62 unsurprisingly down on that seen across the plots as a whole. More surprisingly, eight of the 12 birds found prior to 2023 were missing in the year following their first breeding attempt, only one of which has been found since. Of the five encountered more than once, overall productivity values of 0.67 (over three years), 0.60 (over five years), 0.50 (over four years), 0.50 (over two years) and 0.00 (over three years) have been observed.

The study burrows facilitate an accurate assessment of breeding success on Skokholm. There were 133 burrows at the Lighthouse occupied by a pair which produced an egg, eight burrows contained an egg along the Quarry Track and 25 pairs produced an egg inland of Crab Bay. There were thus 166

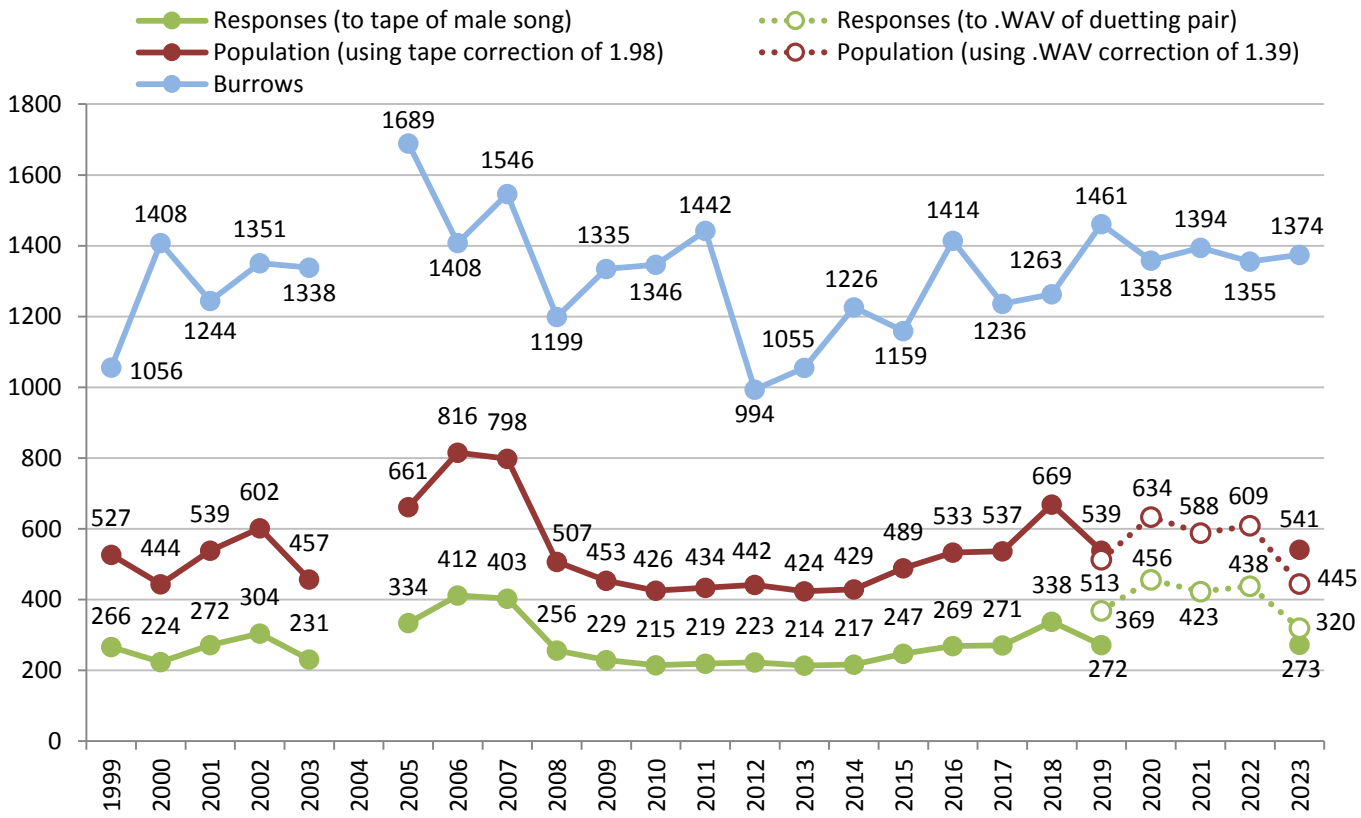
burrows this year from which productivity could be assessed (this up on a 2014-2022 mean of 159.7 and only down on the 168 of 2020 and the 185 of last year). At the Lighthouse 21 definitely failed at egg stage, two of which were close to hatching (one of these coincided with the discovery of parent EA46557 on a Swansea beach (a potential avian influenza casualty, see ringing recoveries below)). An additional 21 pairs failed at egg or very small chick stage, but no eggs, down nor dead chicks were found; three of these burrows had been dug into. There were three chick stage failures, birds which had attained wing lengths of 94mm, 123mm and 141mm before being taken from their burrows (two were excavated, one taken from the entrance). There were two failures along the Quarry Track, one at egg stage and one at egg or very small chick stage. Near Crab Bay there were six failures, five at egg stage (one of which was deposited in a burrow already occupied by a pair which went on to fledge a chick) and one at egg or very small chick stage. A chick is typically assumed to be of fledging size when its wing length is in excess of 200mm; although not ready to fledge, we have previously shown that chicks larger than this may swap to a different burrow and therefore go undetected. However the discovery of FB46025 on 17th May this year is of note; this bird, last seen as a 2015 chick with a wing chord of 165mm, was missing when a same-sized neighbour had attained 198mm, the former leaving its burrow before reaching 200mm (the 2015 productivity figure was thus 0.69 rather than 0.68). In total 113 were believed to have attained fledging size this year.

Productivity was thus 0.68 fledging-sized chicks per breeding pair (68.07% of pairs produced a fledging-sized chick); productivity at the Lighthouse was 0.66 fledglings per pair, along the Quarry Track it was 0.75 and near Crab Bay it was 0.76. The combined 2023 productivity estimate was down on a 2013-2022 mean of 0.71 ±se 0.02, indeed it matched the estimates of 2016 and 2020 as the second lowest of the last 11 years (there was a low of 0.63 in 2014 and highs of 0.80 in 2017 and 0.79 in 2021). 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 Gulls (and to a lesser extent corvids) as they exercise their flight muscles and make their first flights. Having said this, only one of the 113 chicks ringed in the study plots was found eaten after it fledged this year; none of 127 were found in either 2022 or 2021, one of 115 was found in both 2020 and 2019, none of 114 were found in 2018 and two of 135 were found eaten in 2017.

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 project is producing a substantial amount of data, data which is currently difficult to examine in any detail as the British Trust for Ornithology changes its recording system from IPMR to DemOn (the latter of which still lacks the reporting capabilities of the former). Of the 10,561 birds ringed along the transect between 2013 and 2022 (4263 of which were ringed as fledglings), 3096 have been retrapped or found dead on the transect subsequently (with these recaptured individuals accounting for 5300 separate handlings).

The total number of burrows, responses (to tape 1999-2019 and in 2023 and to .WAV 2019-2023) and the corrected population estimates for the 7000m² sampled annually since 1999.



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 size, however only seven plots have been studied for a full 24 years. On each annual visit the number of burrows within each area is counted, as is the number of burrows from which a response is elicited when a recording is played down them. Between 1999 and 2019 the recording was of a singing male made on a cassette tape, the standard correction factor of 1.98 then being used to estimate the population within an area (see the 2013 and 2014 Seabird Reports for checking of the correction factor). The latest whole Island census utilised a .WAV recording of a duetting pair (as opposed to the male only cassette) as it has been shown that a dual-sex recording achieves a higher and less variable response rate, the correction factor thus dropping to 1.39 (Brown and Eagle, 2018; Perkins *et al*., 2017). Bearing this in mind, along with the fact that the cassettes and playback devices are becoming harder to maintain and replace, it was decided in 2019 that it was time to begin the process of changing the annual plot methodology from the use of cassettes to the use of .WAV playback. This changeover will occur over the course of several years to ensure that the data collected over the previous 20 years remains comparable with that collected in the future.

This year saw each of the nine plots visited twice between 30th May and 9th June, with one visit using the old cassette recording of a singing male and one using the new .WAV recording of a duetting pair. The two visits to the 7000m^2 (seven plots) monitored since 1999 produced burrow counts of 1374 and 1369, a difference of five being even closer than the difference of eight achieved in 2019 and another confirmation that the variance in the number of burrows observed between years is in the most part genuine. The former burrow count was 19 up on that of last year, the fourth highest count of the last ten years and 4.4% up on the 1999-2022 mean (1316.39 ±sd 160.69). There was however a substantial decline in the plot started in 2006, the burrow count dropping from 368 in 2022 to 315 this year; this is a relatively stable plot inland from Purple Cove, the decline in apparent burrows perhaps in part due to a thick carpet of Sea Campion covering unused holes. There were 26 fewer burrows in the plot on The Head started in 2015, a total of 140 being the lowest since the 127 of 2017; this is an exposed area of very short sward with no Sea Campion, the decline in burrows likely a genuine one. It is not only digging by Manx Shearwaters which alters the number of burrows present; the weather may both close burrows and cause additional entrance holes to open (with both very dry and very wet periods shaping the landscape), whilst digging by Rabbits, Great Black-backed Gulls and in some areas by Puffins will also influence burrow numbers.

There were 320 responses elicited in the original 7000m^2 using the .WAV recording, this the lowest total recorded during the five years of using this method, down on a high of 456 observed in 2020 and 24.1% down on the 2019-2022 mean (421.50 ±sd 37.51). There were however small increases in four of the plots, whilst another saw a decline of only one response, the overall drop due to substantial declines of 123 responses at the Quarry Track and 33 responses at Horse Bottom; it is unclear why such a decline was seen at these, the densest two plots in the survey. Intriguingly there were 273 responses elicited in the original 7000m^2 using the cassette tape recording, this up on all but one of the years between 2008 and 2019 and virtually matching both a 2019 total of 272 (this the year in which tapes were last used) and a 1999-2019 mean of 270.80 ±sd 59.63; the number of cassette responses at the Quarry Track plot, that which saw the significant drop in .WAV responses, was only one different to that recorded in 2019. The two years of the last five with the lowest number of responses to the .WAV recording are the two years in which both cassette tapes and .WAV were used, a second visit perhaps influencing response rate (both visits were made on the same day); however it should be noted that the .WAV recording was used first at the Quarry Track, the drop in the number of responses not due to an earlier exposure to the cassette.

Using the .WAV correction of 1.39 predicts that there were 445 occupied burrows across the seven plots, whilst a correction of 1.98 for the cassette tape of male song predicts that there were 541 occupied burrows (see chart above). Both estimates are lower than those made over the last three years using only .WAV playback (588-634), however they are close to those made between 2008 and 2019 using the cassettes (the 2008-2019 mean is 490.07 ±sd 72.55, the 2023 .WAV estimate 9.2% down on this and the 2023 cassette estimate 10.4% up). Any comparison between the population predicted using the .WAV recording of the duetting pair and the male only cassette recording should clearly be a cautious one, although given that both the 2019 and 2023 .WAV estimates are below the cassette estimates, it is likely that we are not overestimating the population when using the .WAV correction any more than when using the tape correction. The .WAV survey suggested a 2022-2023 population decline of 24.8% in the 1000m^2 plot visited since 2006, the cassette survey a 27.4% decline in the same area since 2019; adding this data to that from the other 7000m^2 suggests that the combined population could be the lowest of the last nine years, albeit close to that seen between 2009 and 2015 (see table below). The .WAV survey suggested a 2022-2023 population decline of 37.7% in the 1000m^2 plot visited since 2015, the cassette survey a 34.3% decline in the same area since 2019. Although the number of pairs producing eggs in the accessible study burrows is stable, and it must be remembered that the proportion of burrows which respond to the playback on any given date varies considerably (leading to a high degree of error in these numbers (see Brown and Eagle, 2013, 2014 and 2019)), there is perhaps an indication here that the Skokholm Manx Shearwater population has declined after a peak, at least in some areas (although it would appear to be more stable in the 7000m^2 surveyed since 1999).

The estimated number of pairs in the 8000 square metres sampled 2006-2023, based on responses to a cassette of male song 2006-2019 and on responses to a .WAV of a duetting pair since 2020.

2006	2007	2008	2009	2010	2011	2012	2013	2014
869	954	620	525	499	495	501	521	476
2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
533	588	584	739	655	730	670	710	521

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 carcases would be impacting the species reliant on 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. The corpses are left in situ but marked by neatly slicing the flight feathers of both wings with a pair of scissors (using scissors has the added advantage that it makes it easier to check for rings in tightly inverted bodies). Although the vast majority of Manx Shearwater kills are made by Great Black-backed Gulls, a small number are also taken by Peregrines and Ravens, whilst a Sparrowhawk eating the head of a puffinosised youngster in 2019 had perhaps also made the kill and three Crow were seen tackling a live bird on 19th May 2022.

As might be expected with a larger Great Black-backed Gull breeding population, the number of corpses marked over the last ten years has been the most ever. However the average number of corpses per Great Black-backed Gull pair was only 41.3 in 2023; this has only been lower in nine previous years (including six of the last seven), with all-time lows of 30.8 in 1959 and 27.6 in 1970 (there were highs of 280.3 in 1968, 318.8 in 1977 and 182.0 in 1978). One possible explanation for this reduction in kills per pair is that the gulls were routinely disturbed between 1949 and 1985 which, whilst reducing the number of breeding pairs, probably inflated the non-breeding flock (which would still be taking shearwaters). The number of adults found dead was the second lowest of the last decade, with a total of 1859 only up on the 1618 of 2019 and 20.7% down on the 2014-2022 mean (2343.67 ±sd 451.84). Factors which may impact predation rates are the number of Great Black-backed Gulls present (and the number specialising in shearwaters (Westerberg *et al.*,

2018)), vegetation heights, the complexities of the weather and moon cycle influencing hunting, the availability of food away from the Island and perhaps the size of the Rabbit population (Rabbits being the other main prey item on the Island). The prevalence of puffinosis may well be influencing juvenile losses (see recent Skokholm Seabird Reports). It is often suggested that the majority of eaten shearwaters are younger, less experienced non-breeders, those which spend longer on the surface as they prospect for burrows and mates. However the 88 ringed birds found predated in 2023 again do little to support this theory (see below table and the 2018-2022 Seabird Reports); although several more years of ringing data would be helpful and there is no information on the breeding status of those eaten (so they could perhaps still have been unpaired or burrowless birds spending longer on the surface), at least 35 of 72 eaten adults were at least eight years old (48.6%).

The number of Manx Shearwater corpses found between 1957 and 1983 from Gynn (1984) plus data from 1984 to 1991 and 2014 to 2023. 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	1967	1968
Corpses	2465	1886	924	1354	1089	640	688	1059	857	946	816	841
GBBGU	27	30	30	10	12	5	7	12	8	10	10	3
	1969	**1970**	**1971**	**1972**	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**
Corpses	829	304	606	1350	1082	869	1051	1266	1913	1820	1153	1024
GBBGU	14	11	16	12	12	7	7	7	6	10	10	10
	1981	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**2014**
Corpses	1080	1479	1373	1316	1571	1068	1759	1760	1694	1915	2703	4271
GBBGU	11	16	11	14	11	10	11	12	15	16	20	84
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**			
Corpses	4123	3782	3449	3270	2707	4091	3237	2902	2724			
GBBGU	83	93	93	93	86	83	80	78	66			

The number of adult and juvenile Manx Shearwater corpses found each year since 2014, along with the number of untouched puffinosised bodies.

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Adults	2931	2702	2299	2071	2228	1618	3008	2132	2104	1859
Juveniles	1287	1324	1398	1289	971	1043	970	967	728	756
Puffinosis	53	97	85	89	71	46	113	138	70	109
Total	**4271**	**4123**	**3782**	**3449**	**3270**	**2707**	**4091**	**3237**	**2902**	**2724**

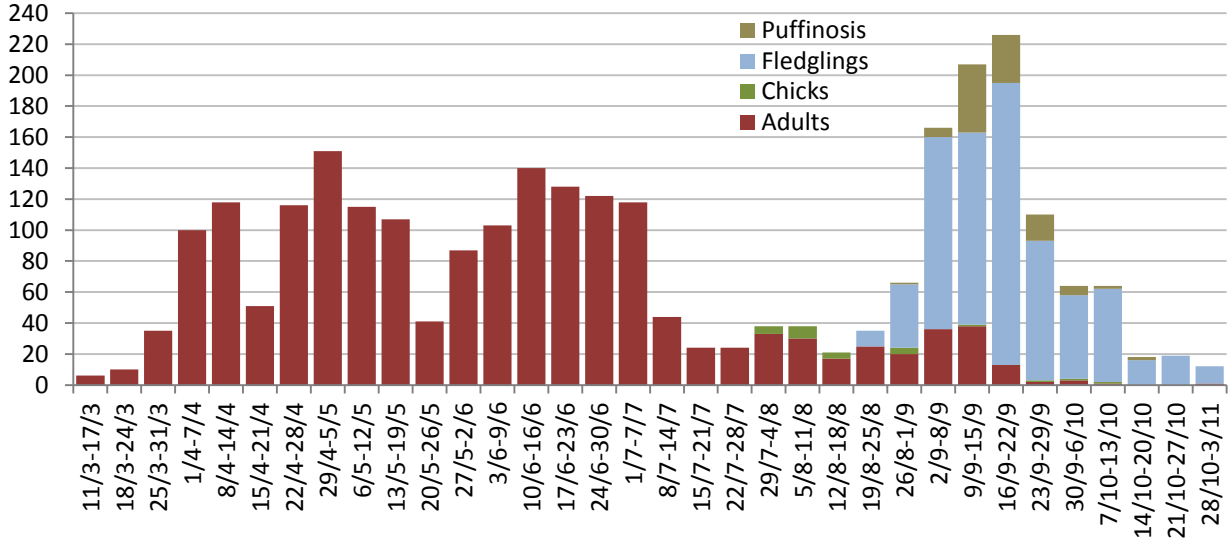
When the 88 ringed shearwaters found eaten in 2023 were marked. Note that the pre-2013 birds were controls ringed elsewhere (as were two ringed as adults in 2021) and that intensive ringing on Skokholm recommenced in 2013.

Pullus 2000	Adult 2004	Adult 2013	Adult 2014	Fledgling 2014	Adult 2015	Fledgling 2015	Adult 2016	Fledgling 2016	Adult 2017	Pullus 2017
1	1	8	10	2	7	1	5	3	3	2
Fledgling 2017	**Adult 2018**	**Fledgling 2018**	**Adult 2019**	**Fledgling 2019**	**Adult 2021**	**Adult 2022**	**Adult 2023**	**Pullus 2023**	**Fledgling 2023**	
5	6	1	3	4	5	3	2	1	15	

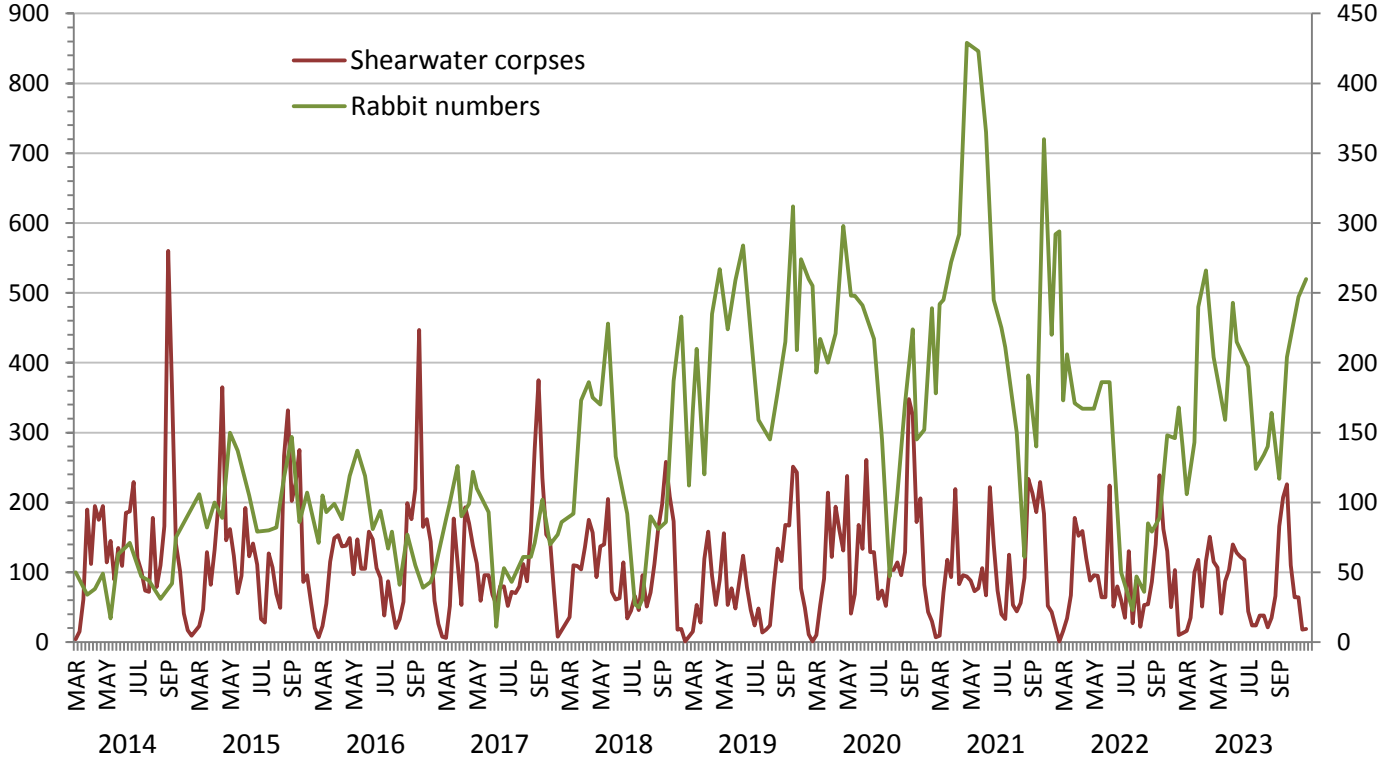
The data from the last ten years lends some support to the theory that Rabbit numbers influence Manx Shearwater predation (by providing an alternative food source for the gulls). The North Plain Rabbit count was lowest in 2014, when shearwater mortality and the number of corpses per Great Black-backed Gull pair were at their highest. The Rabbit counts were at their highest in 2019 and 2021, the former the year with the fewest shearwater corpses and the lowest number of corpses per pair, the latter the year with the fourth fewest corpses found. This year saw the fourth highest Rabbit counts and the fifth highest number of corpses per Great Black-backed Gull pair (albeit the

second lowest corpse total of the last ten years). The 2020 data did not fit this pattern, with the highest number of adult Manx Shearwater corpses being found in a year with a high Rabbit population (although a COVID-19 dictated reduction in disturbance may have given the gulls longer to hunt). One potential issue with this comparison is that North Plain Rabbit counts are probably not representative of the whole Island, with the effects of Viral Haemorrhagic Disease seemingly differing in different parts of the Island at the same time. Nevertheless it will be interesting to see if the next crash in Rabbit numbers coincides with an increase in Manx Shearwater carcasses.

The number of corpses found during each week from 11th March until 3rd November 2023.

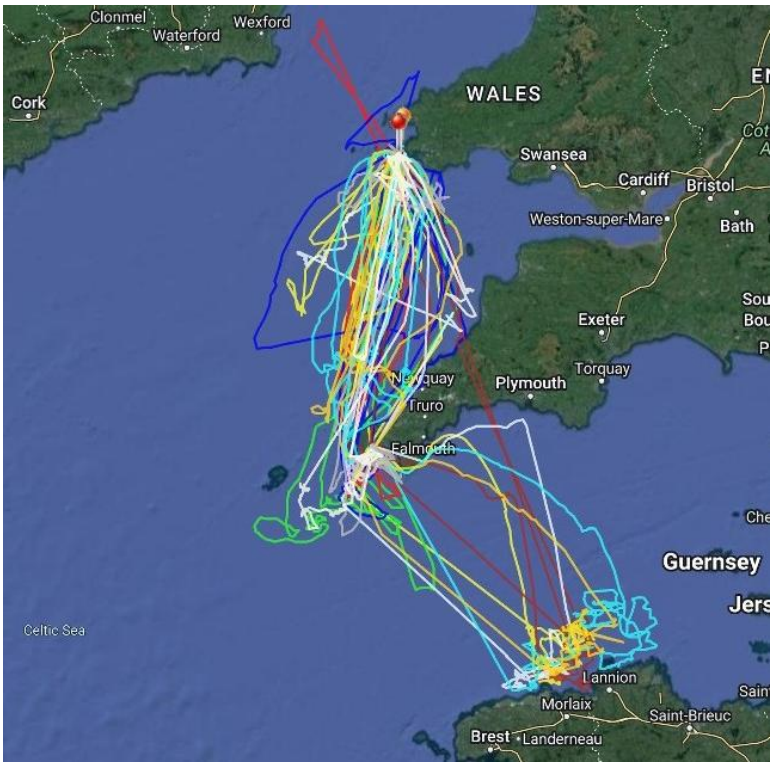


The total number of Manx Shearwater carcasses found each week 2014-2023 and the number of Rabbits counted in the North Plain census plot during the same period (secondary axis).



There were 20 chick rearing adults tracked from the Lighthouse Study Plot, with Oliver Padget and his team from the Oxford Navigation Group fitting and retrieving devices from 24th July to 9th August. Two different types of GPS device were used for this short-term deployment, both new technologies

which will improve data quality. Ten were Ornitela GPS-GSM devices which save GPS locations ascertained as normal using satellites, but then download these via the mobile GSM (3G) network when birds come close to the coast; this means that updates are received every few hours if shearwaters are in mobile signal. Despite not needing to retrieve these devices to obtain data, all ten were recovered after one or several foraging trips. The second device type was the new Oxford snapperGPS. These take 'snapshots' of GPS signals but, rather than process their location on-board, locations are computed after retrieval; this means that the devices use far less power than normal, allowing very high temporal resolution data to be collected. All ten snappers were also retrieved. As with previous studies, birds visited the waters earmarked for the Erebus wind farm and similar future projects (the map opposite shows GPS-GSM tracks linked by straight lines (birds did not fly over Cornwall)).



The first fledgling to be encountered was along the Lighthouse Track at 23:30 on 17th August, this four days earlier than the 2013-2022 mean and matching one in 2021 as the earliest to be logged during this period (two on the 27th in 2018 were the latest). The first fledgling showing signs of puffinosis was along the Lighthouse Track on the 28th, this three days later than the first of last year but one day earlier than the 2013-2022 mean. Puffinosis is a mysterious affliction which had been linked to the actions of a coronavirus, this leading to the development of conjunctivitis and blistered feet, further bacterial infection and problems with limb control (Nuttall and Harrap, 1982); it is typically fatal. A December 2022 paper concluded that, rather than being the result of a virus, the bacterial infection may actually occur following prolonged exposure to caustic faecal ammonia which causes foot dermatitis, this similar to the Foot Pad Dermatitis seen in chickens (Esmonde *et al*., 2022). Foot Pad Dermatitis occurs in chickens kept in poorly ventilated conditions, where respiration and excretion lead to high moisture levels which exacerbate the impact of faecal ammonia burns (Esmonde *et al*., 2022). Puffinosis has long been associated with the damper areas of Skokholm, conditions which may lead to a similar build-up of moist ammonia. In an attempt to achieve a better understanding of how puffinosised birds are distributed across the Island during the course of the autumn and of how the number of infected individuals changes from year to year, a transect walked by Island staff over eight September nights was established in 2015 (the 2015 Seabird Report gives details of the route). The position of each fledgling is recorded using a GPS unit before they are inspected for signs of puffinosis.

The number of shearwater fledglings located along the transect is likely to be different between years, not just because of fluctuations in productivity, but more critically due to differences in the weather and moon cycle which influence their surface behaviour. Over the eight visits there were 42 more fledglings encountered this year than in 2021, with a total of 943 being 15.3% up on the 2015-2021 mean (817.57 ±sd 181.86). An eight visit total of 83 apparently infected birds matched that of 2021 and was 24.8% down on the mean (110.43 ±sd 74.53), the proportion of birds showing signs being the second lowest to date (there was a high of 29.1% in 2015 and a low of 8.7% in 2018, the 2015-2021 mean being 13.5%). 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. Indeed a drier northerly route, which held 270 fledglings over eight 2020 nights, only produced one

bird showing signs of puffinosis (0.4%); the infected bird was along North Pond Wall, close to the Farm where a small number of similar birds have been seen previously (see lower map below).

The number of fledgling Manx Shearwaters encountered along the transect between 2017 and 2023, along with the number which showed signs of puffinosis (also given as a proportion of the total). Restrictions put in place to limit the spread of any potential HPAI outbreak meant that birds could not be adequately inspected in 2022, the puffinosis survey being suspended for that year.

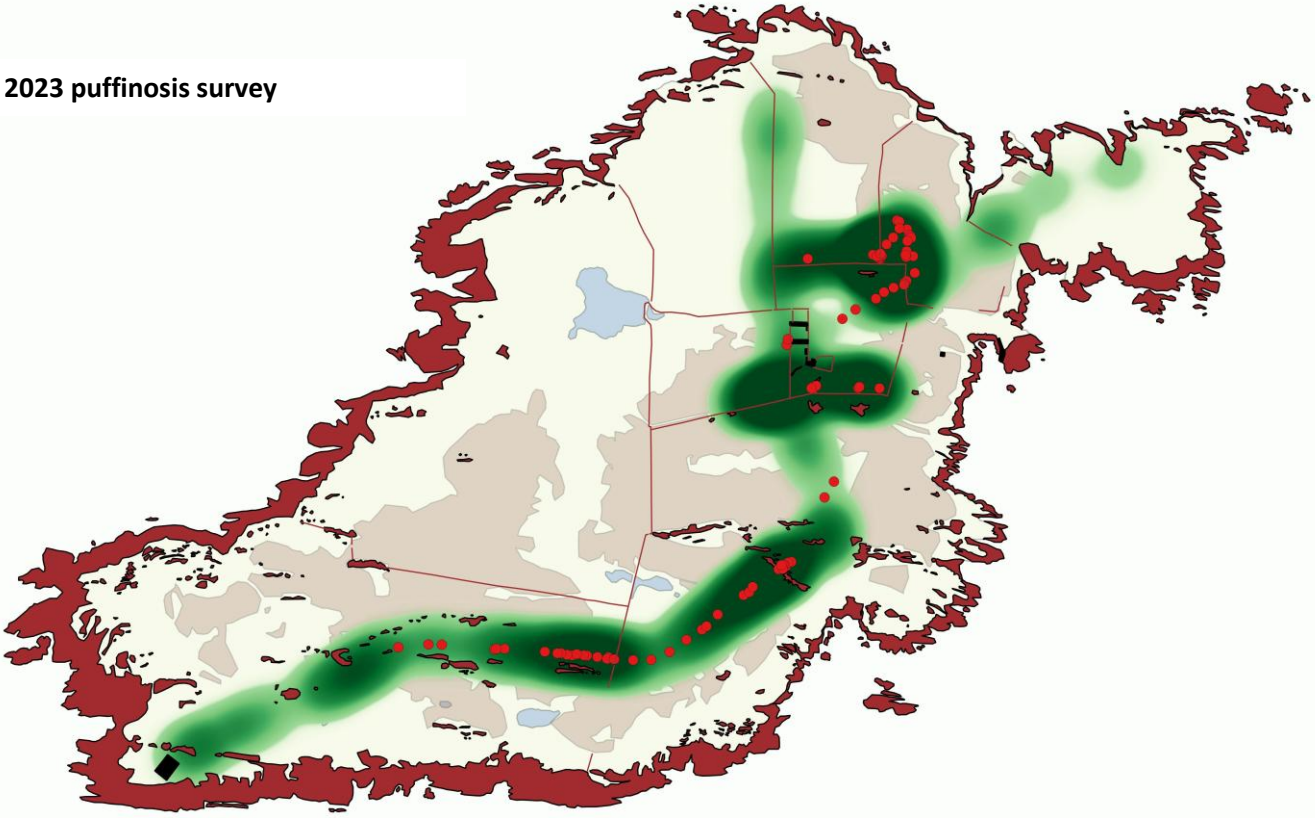
2023	1st-2nd	4th-5th	7th-8th	12th-13th	13th-14th	14th-15th	18th-19th	20th-21st	Total
Birds	56	127	174	196	140	126	76	48	943
Puffinosised	1	5	11	29	17	11	7	2	83
% Puffinosised	1.8	3.9	6.3	14.8	12.1	8.7	9.2	4.2	8.8
2021	1st-2nd	4th-5th	7th-8th	11th-12th	13th-14th	16th-17th	18th-19th	20th-21st	Total
Birds	147	143	228	152	111	75	29	16	901
Puffinosised	9	10	16	14	11	9	10	4	83
% Puffinosised	6.1	7.0	7.0	9.2	9.9	12.0	34.5	25.0	9.2
2020	1st-2nd	4th-5th	7th-8th	11th-12th	13th-14th	16th-17th	18th-19th	20th-21st	Total
Birds	52	101	201	235	118	111	68	55	941
Puffinosised	1	5	2	23	14	14	15	10	84
% Puffinosised	1.9	5.0	1.0	9.8	11.9	12.6	22.1	18.2	8.9
2019	1st-2nd	4th-5th	7th-8th	11th-12th	13th-14th	16th-17th	18th-19th	20th-21st	
Birds	120	182	100	70	55	81	34	49	691
Puffinosised	6	2	11	16	9	9	6	6	65
% Puffinosised	5.0	1.1	11.0	22.9	16.4	11.1	17.6	12.2	9.4
2018	1st-2nd	4th-5th	7th-8th	9th-10th	12th-13th	15th-16th	18th-19th	21st-22nd	
Birds	72	142	139	197	155	167	88	48	1008
Puffinosised	2	3	11	16	23	21	10	2	88
% Puffinosised	2.8	2.1	7.9	8.1	14.8	12.6	11.4	4.2	8.7
2017	1st-2nd	4th-5th	8th-9th	11th-12th	14th-15th	17th-18th	20th-21st	23rd-24th	
Birds	44	77	100	115	66	43	42	21	508
Puffinosised	4	13	16	10	4	16	14	1	78
% Puffinosised	9.1	16.9	16.0	8.7	6.1	37.2	33.3	4.8	15.4

Given that there is seemingly a link between wetter, poorly drained areas and diseased birds, one possible explanation for the lower proportion of puffinosised individuals encountered in recent years is that they all proved to be comparatively dry breeding seasons, although the more specific period during which wet conditions may lead to puffinosis is still unknown. That the proportion of infected birds was lowest in 2018, 2020, 2021 and 2023, the four years which have seen the lowest totals of predated juveniles (see above), is intriguing; it is quite probable that puffinosised birds are easier for Great Black-backed Gulls to catch, potentially leading to higher mortality in high puffinosis years (it would often be difficult to tell if an eaten bird had been diseased). However the number of juvenile corpses located in 2015, the worst puffinosis year of this eight year study, was not significantly higher than in 2016 and 2017 when the proportion of puffinosised birds was lower.

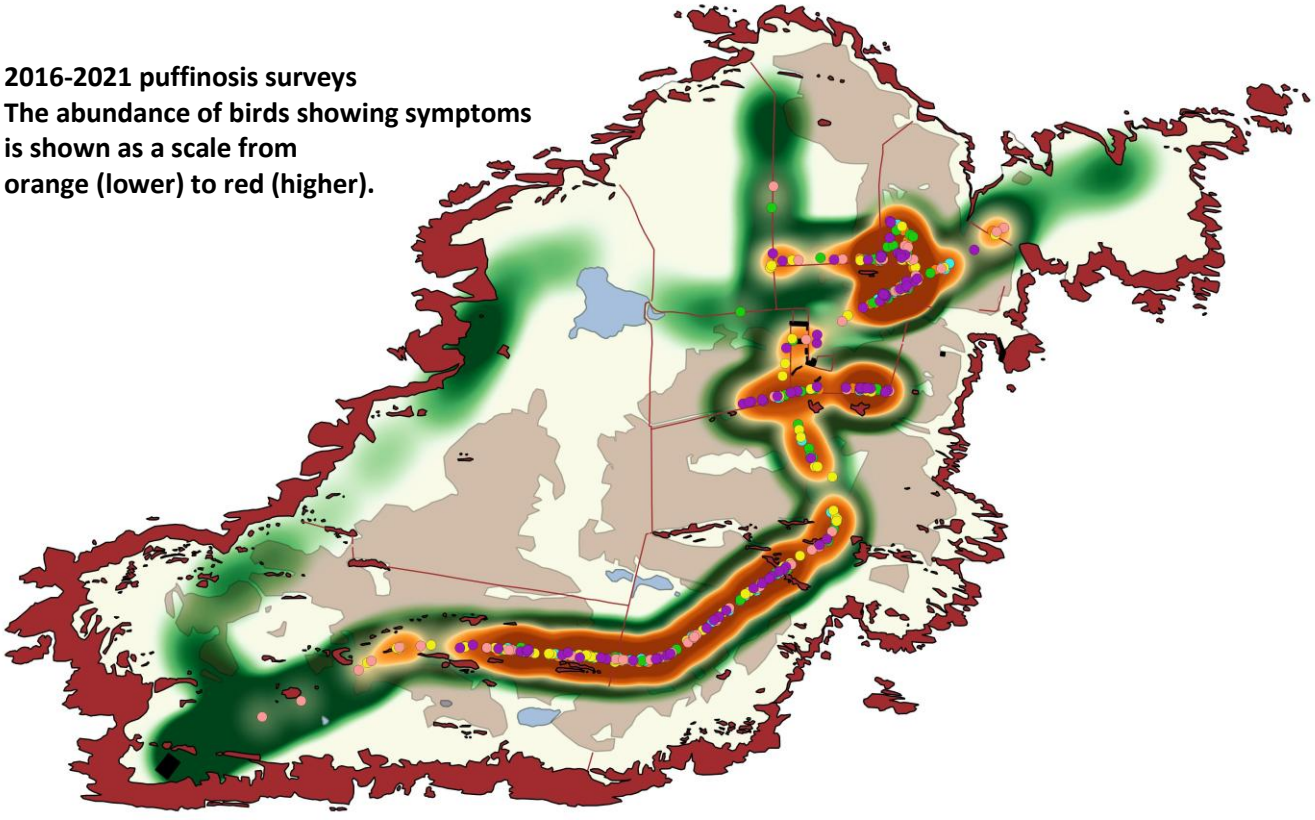
Of the 113 study plot fledglings, 22 (19.5%) had departed their natal burrows by 2nd September (49.6% had gone by the 4th in 2021, whilst there was no check last year due to HPAI concerns). Seawatching during the month produced daycounts of 14,000 on the 1st, 16,000 on the 2nd and 10,150 on the 3rd, although there were no counts of more than 578 after the 6th and 171 on the 28th was the high during the last third of the month; the September peak was the second highest to date, only down on the 20,115 logged on the 8th in 2018. Although birds were regularly calling at night until 11th October, the last grounded adults to be encountered along the transect were recorded on 18th September (a bird ringed in April 2013 and not seen since and a bird ringed in May 2014 and only seen in 2014 and 2023); these were one day later than the 2014-2021 last ringed adult mean.

The 2023 and 2016-2021 puffinosis surveys. Manx Shearwater fledgling density is shown in green, with the darker areas holding more birds (the northern footpath between Middle Heath and the Table was only surveyed in 2020). Each puffinosised bird encountered over the eight visits is marked by a circle, red in 2023, pink in 2021, lime in 2020, blue in 2019, yellow in 2018, orange in 2017 and purple in 2016. The 2018 Bracken distribution is also shown.

2023 puffinosis survey



2016-2021 puffinosis surveys
The abundance of birds showing symptoms is shown as a scale from orange (lower) to red (higher).



There were 48 at sea on 1st October, with seven along the Lighthouse Track that night taking the daycount to 55, this the second highest in this month (there were 83 on the 5th in 2014). Up to seven were at sea on three further October dates to the 6th, whilst juveniles were either seen after dark or found freshly eaten on all but one date to the 11th. There followed a juvenile at the Well on the 13th, a fresh kill on the 20th and further nocturnal juveniles on the 22nd and 24th, the latter the last to be seen on the ground in 2023 (11 days later than the last of 2022). One in Broad Sound on the 29th was the last to be seen at sea, whilst the only November record was of one calling over Spy Rock after dark on the 4th; there have been November records in 13 previous years, including eight of the last nine, with a peak nocturnal count of 11 on the 3rd in 2015, peak seawatching counts of seven on the 3rd in 2018 and on the 15th in 2022 and late youngsters on the 14th in 2014 and on the 22nd in 2021 (the latter of which was eaten by a Raven). One heading west through Broad Sound on the 1st in 2021 remains the only December record. One of the 897 ringed birds to fledge Skokholm this year was found on the mainland (0.11%), this matching the 2014-2021 mean (see below for details).

Ringing recovery EA15047
Originally ringed as an adult, LITTLE SALTEE ISLAND, WEXFORD, IRELAND 3rd August 2021
Recovered as an adult, SKOKHOLM 11th June 2023
Finding condition Fresh dead, eaten by Great Black-backed Gull
Distance travelled 101km at 120 degrees (ESE)
Days since ringed 677

Ringing recovery EA46557
Originally ringed as a non-breeding adult, LIGHTHOUSE PLOT 4A, SKOKHOLM 29th May 2020
Previously recovered as a breeding adult, LIGHTHOUSE 19, SKOKHOLM 20th May and 1st June 2023
Recovered as an adult, BLACKPILL, SWANSEA 16th July 2023
Finding condition Fresh dead alongside 35 dead Guillemot and one dead Razorbill
Distance travelled 92km at 97 degrees (E)
Days since ringed 1143

Ringing recovery EG64898
Originally ringed as an adult, COPELAND, COUNTY DOWN, NORTHERN IRELAND 18th July 2004
Recovered as an adult, SKOKHOLM 8th April 2023

Finding condition Fresh dead, eaten by Great Black-backed Gull
Distance travelled 334km at 178 degrees (S)
Days since ringed 6838

Ringing recovery EM54384
Originally ringed as a juvenile, MANX SHEARWATER TRANSECT, SKOKHOLM 15th September 2023
Recovered as a juvenile, WARMFIELD, WAKEFIELD, WEST YORKSHIRE 23rd September 2023
Finding condition Unknown species found seemingly sick and perhaps destroyed
Distance travelled 340km at 50 degrees (NE)
Days since ringed 8
Storm force southwesterlies had battered Skokholm on the 19th and 20th September. Nevertheless this was a disappointing end for a bird which perhaps just needed returning to the coast.

Ringing recovery EY72026
Originally ringed as an adult, MANX SHEARWATER TRANSECT, SKOKHOLM 15th August 2013
Recovered as an adult, BLACK ROCK SANDS, MORFA BYCHAN, GWYNEDD 20th April 2023
Finding condition Fresh dead on beach, no obvious oiling or injury
Distance travelled 153km at 30 degrees (NNE)
Days since ringed 3535

Ringing recovery EY72140
Originally ringed as a juvenile, MANX SHEARWATER TRANSECT, SKOKHOLM 30th August 2013
Recovered as an adult, PUERTO SAN ANTONIO ESTE, ARGENTINA 7th April 2023
Finding condition Unknown species dead for more than a week
Distance travelled 11,802km at 210 degrees (SSW)
Days since ringed 3507
This is the farthest south a Skokholm ringed bird has been encountered since ringing recommenced. Perhaps surprisingly there have only been 33 Manx Shearwater ringed in Britain or Ireland and recovered in Argentina, including a Skokholm bird recovered in February 2022; this is far fewer than in Brazil (290), but more than in Uruguay (26). There have been 17 further Skokholm ringed Manx Shearwater found dead or moribund in South America since 2013; there was one in September 2014, two in November 2015, two in September and one in October 2016, singles in September and October 2017, one in November 2018, singles in March and November 2019, two in September 2020, one in September 2021 and singles in February, August and September last year. They have all been found in Brazil, bar the November 2018 casualty found in Uruguay and the February 2022 bird

in Argentina. Assuming that birds ringed as adults have already survived at least two winters, four have now been found in their first winter, three in their second winter, two in at least their third winter, four in at least their fourth winter, one in at least its fifth winter, one in at least its sixth winter, one in at least its seventh winter, one in its tenth winter and one in at least its tenth winter.

Ringing recovery EZ16102
Originally ringed as an adult, MANX SHEARWATER TRANSECT, SKOKHOLM 11th July 2015
Recovered as an adult, SKOMER ISLAND, PEMBROKESHIRE 24th July 2023
Finding condition Dead, 'no information about how long, taken by other species of bird'
Distance travelled 4km at 343 degrees (NNW)
Days since ringed 2935

Ringing recovery EZ86130
Originally ringed as a juvenile, SKOKHOLM 12th September 2017
Recovered as an adult, POBBLES BEACH, SWANSEA 16th July 2023
Finding condition Dead, washed up with five other 'similar birds'
Distance travelled 83km at 101 degrees (ESE)
Days since ringed 2133
It is concerning that three adult birds were found moribund on Welsh beaches this year, this more than is typical and perhaps the result of avian influenza (although none were tested to confirm this).

Ringing recovery FB04821
Originally ringed as a pullus, SKOMER ISLAND, PEMBROKESHIRE 2nd June 2000
Recovered as an adult, MANX SHEARWATER TRANSECT, SKOKHOLM 11th June 2023
Finding condition Fresh dead, eaten by Great Black-backed Gull
Distance travelled 4km at 163 degrees (SSE)
Days since ringed 8409

Ringing recovery FB58748
Originally ringed as an adult, BARDSEY ISLAND, GWYNEDD 7th July 2021
Recovered as an adult, SKOKHOLM 28th June 2023
Finding condition Fresh dead, eaten by Great Black-backed Gull
Distance travelled 125km at 196 degrees (SSW)
Days since ringed 721

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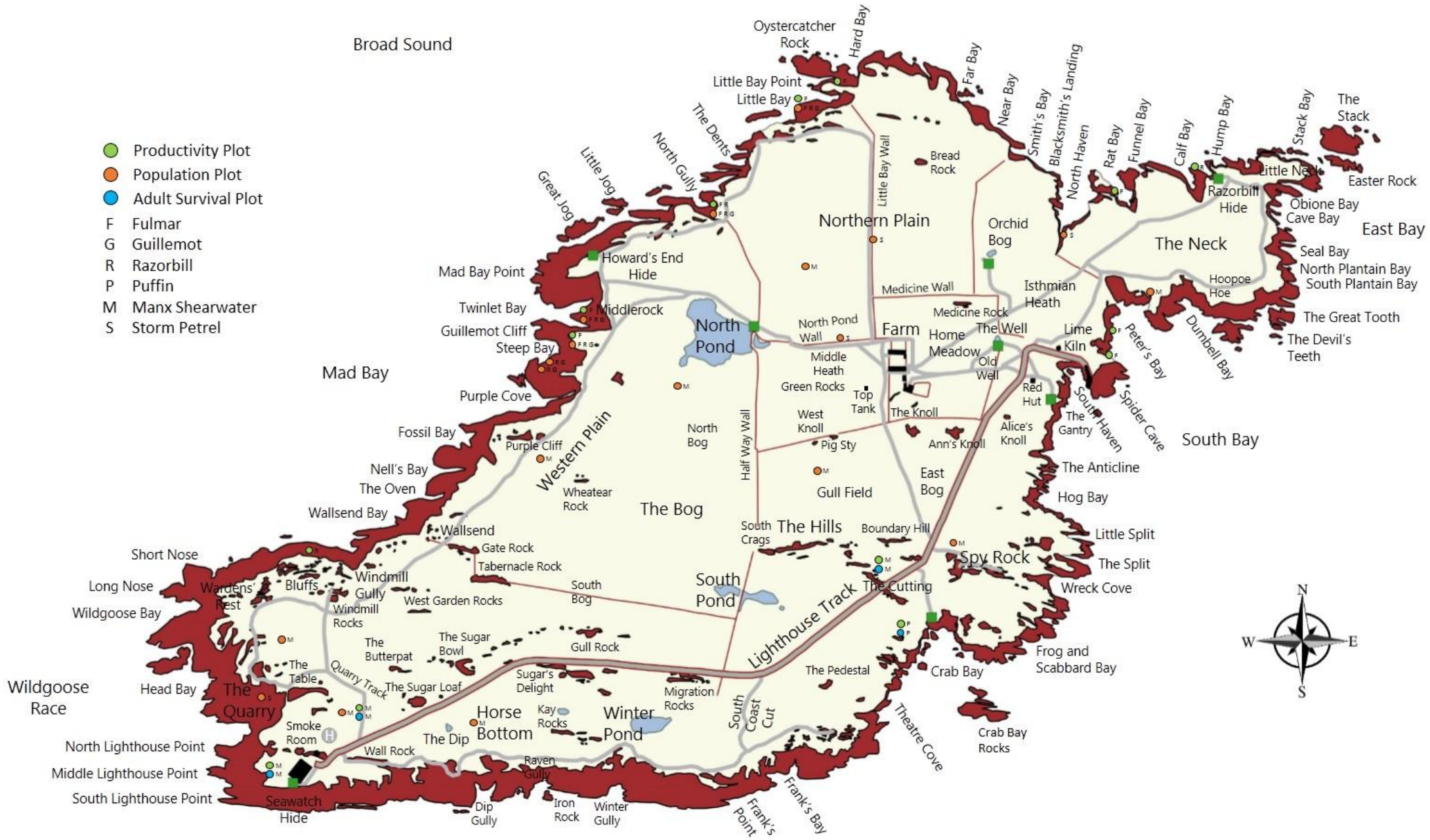
Report by Richard Brown and Giselle Eagle


Productivity Plot
Population Plot
Adult Survival Plot
F Fulmar
G Guillemot
R Razorbill
P Puffin
M Manx Shearwater
S Storm Petrel
Broad Sound
Oystercatcher Rock
Hard Bay
Far Bay
Near Bay
Smith's Bay
Blacksmith's Landing
North Haven
Rat Bay
Funnel Bay
Calf Bay
Hump Bay
Stack Bay
The Stack
Little Neck
Easter Rock
Razorbill Hide
Obione Bay
Cave Bay
East Bay
Seal Bay
North Plantain Bay
South Plantain Bay
The Great Tooth
The Devil's Teeth
Little Bay Point
Little Bay
The Dents
North Gully
Little Jog
Great Jog
Little Bay Wall
Bread Rock
Northern Plain
Orchid Bog
The Neck
Howard's End Hide
Mad Bay Point
Twinlet Bay
Middlerock
Guillemot Cliff
Steep Bay
Mad Bay
Purple Cove
Fossil Bay
Nell's Bay
The Oven
Wallsend Bay
Wallsend
Short Nose
Long Nose
Wildgoose Bay
Wardens' Rest
Bluffs
Windmill Gully
Windmill Rocks
Gate Rock
Tabernacle Rock
West Garden Rocks
North Pond
North Pond Wall
Medicine Wall
Medicine Rock
Isthmian Heath
Hoopoe Hoe
Dumbell Bay
Peter's Bay
Lime Kiln
Farm
Home Meadow
The Well
Old Well
Middle Heath
Green Rocks
Top Tank
The Knoll
West Knoll
Pig Sty
Ann's Knoll
Alice's Knoll
Red Hut
The Gantry
South Haven
Spider Cave
South Bay
Western Plain
North Bog
Half Way Wall
Purple Cliff
Wheatear Rock
The Bog
East Bog
Gull Field
The Anticline
Hog Bay
Little Split
The Split
Wreck Cove
South Crags
The Hills
Boundary Hill
Spy Rock
The Cutting
South Bog
South Pond
Lighthouse Track
Frog and Scabbard Bay
Crab Bay
The Pedestal
Crab Bay Rocks
Theatre Cove
Frank's Bay
Frank's Point
South Coast Cut
Migration Rocks
Wildgoose Race
Head Bay
The Quarry
The Table
Quarry Track
The Butterpat
The Sugar Bowl
The Sugar Loaf
Sugar's Delight
Gull Rock
Smoke Room
Horse Bottom
The Dip
Kay Rocks
Winter Pond
Wall Rock
Raven Gully
North Lighthouse Point
Middle Lighthouse Point
South Lighthouse Point
Seawatch Hide
Dip Gully
Iron Rock
Winter Gully
N
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