



Flamborough and Filey Coast SPA Seabird Monitoring Programme

2022 Report



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SUMMARY

Once again, the full programme of seabird monitoring was successfully completed by a full-time Seabird Research Assistant, seasonal Seabird Research residential volunteer and members of the Bempton Cliffs reserve staff and volunteer team.

Warm and spring like weather through March not only allowed the birds to settle into their breeding routine, but also facilitated the Puffin pre-breeding census. As with 2021, the cold northerlies and wintry showers brought March to an end, although thankfully were short lived. Throughout the spring the weather was drier than usual with very little rain which continued into early May, prompting a slight delay to Kittiwake nest-building as they waited for the rain. The first Gannet egg was seen on 19 April, which was considered relatively late. The first Guillemot and Razorbill eggs were seen from Grandstand on 25 April and represented a more expected date after last years delayed season. The first Kittiwake egg was noted on 16 May at Breil, at a time when it was felt that there was a slight delay to their nesting. The first Herring Gull eggs were noted on 10 May.

The results from this year's productivity monitoring were mixed, with Kittiwake having their most successful year since 2010. Conversely, Gannet had their worst ever year due to Highly Pathogenic Avian Influenza (HPAI) which heavily impacted the monitoring plots at Staple Newk. Fulmar, Herring Gull and Razorbill also had their lowest year ever, whilst Guillemot showed only a slight decrease (Figure 1).

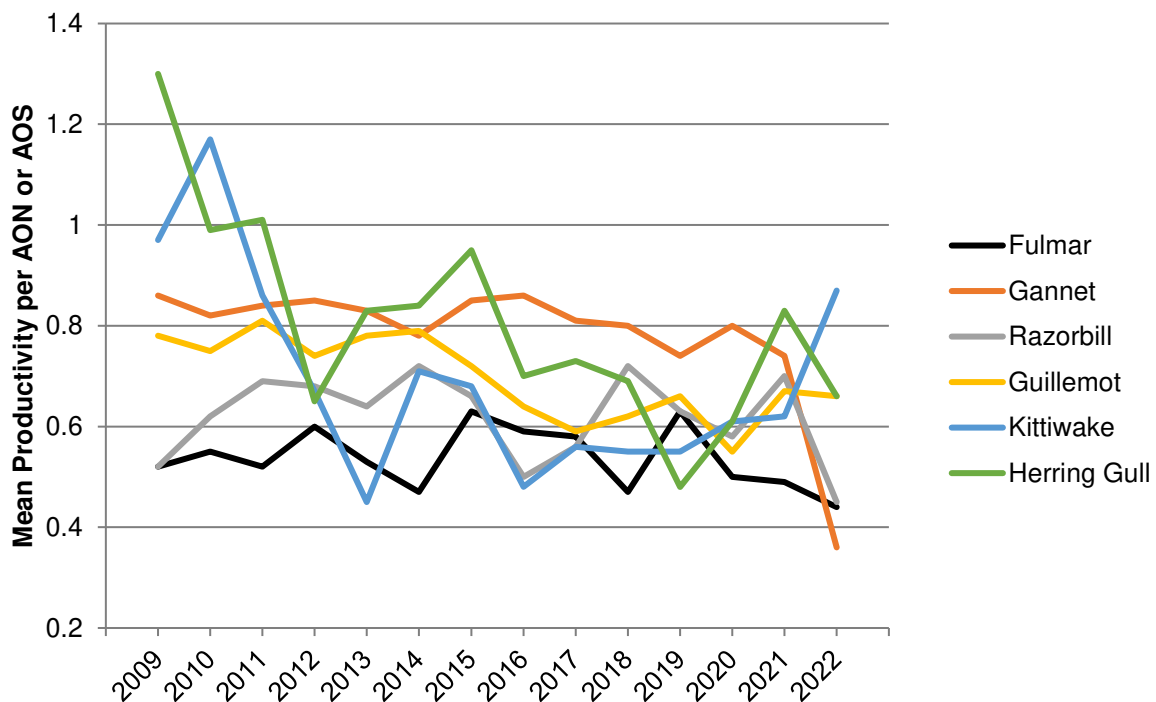


Figure 1: Summary of the productivity trends of the six seabird species monitored from 2009-2022.

N.B.1: Kittiwake and Fulmar results include Filey in with the original Flamborough and Bempton Cliffs results from 2012 and 2017 respectively.

N.B.2: In 2020, productivity monitoring followed a reduced programme with a late start, a reduced number of monitoring plots and an altered method of analysis for some species.

The results from the 2022 breeding season are as follows:

Northern Fulmar: Fifty-four chicks fledged from 138 Apparently Occupied Sites (AOS), resulting in a mean productivity of 0.44 chicks fledged per pair. The general productivity trend shows a slight decrease, reaching their lowest ever productivity recorded.

Northern Gannet: All five plots on the reserve were monitored in 2022, following the traditional methodology of visits every 7-10 days. Only 99 chicks fledged from 267 Apparently Occupied Nests (AON), resulting in a mean productivity of 0.36 chicks fledged per pair. This is the lowest ever productivity recorded and reflects the severe impact of HPAI at Staple Newk.

Black-legged Kittiwake: Nineteen plots were monitored across the SPA and included a total of 968 AON. From those nests, 849 chicks successfully fledged producing a mean productivity of 0.87 chicks per pair. This is a marked increase on 2021 and was the best season since 2010. The long-term trend remains of concern, however there are hints of an improvement in the short-term.

European Herring Gull: Productivity decreased dramatically with just 23 chicks fledged from 80 AON, the mean productivity of 0.25 chicks fledged per pair being the lowest ever recorded. The long-term trend of continued decline shows no signs of levelling off.

Common Guillemot: One hundred and sixty-five chicks fledged from 272 AOS producing a mean productivity of 0.61 chicks fledged per pair. Productivity decreased slightly from 2021; both Gannet and Carrion Crow are impacting productivity success on the Nettletrip and Grandstand North reserve plots, however this may not reflect what is happening across the wider colony.

Razorbill: A total of 224 AOS were monitored from which 112 chicks successfully fledged, producing a mean productivity of 0.45 chicks fledged per pair. This was a dramatic decline from 2021, and the lowest recorded. Again, corvid predation on the Grandstand and Mosey Downgate reserve plots affected their results and may not reflect what is happening in the wider colony.

Early season Atlantic Puffin survey

For the first time since 2018, a pre-breeding survey of Atlantic Puffin staging on the sea in the early season period was successfully completed in mid-March this year. Approximately 3080 individuals were counted across the length of the SPA and compliments a whole colony count which was also undertaken here this summer. ***It is important to stress that this survey is not designed to provide an accurate census of the breeding population of Atlantic Puffin at this colony, however, it provides an index where large scale year-to-year fluctuations can be monitored.***

Study-plot counts

The Kittiwake, Guillemot and Razorbill study-plot counts were successfully completed in the first three weeks of June. The mean Kittiwake count of 1871 AON was 52 AON higher than in

2021 and continues a stable long-term trend. For the third successive year the second count was higher than the first, possibly due to a delayed start to their breeding season.

The mean Guillemot count of 1560 IND was the second highest mean total, being just 23 birds fewer than the 1583 IND recorded in 2021. However, this continues the long-term upward trend. The mean Razorbill count continues to climb for the seventh successive year, with 1065 IND recorded for the first time.

Chick provisioning of the Guillemot and Razorbill

As part of an RSPB sabbatical, data on Guillemot and Razorbill chick diet was collected at Bempton Cliffs and Flamborough Head. Over a four-week period, data from 150 nest sites (126 Guillemot and 24 Razorbill) were recorded, with 661 prey items identified. The results followed expected trends with sandeel sp. comprising 98.6% of Razorbill diet and Sprats making up 79.1% of Guillemot diet. The data shows a marked increase in sandeel feeds for both Guillemot and Razorbill when compared to the 2015 and 2021 auk diet results.

Black-legged Kittiwake Retrapping Adults for Survival (RAS) project

A Black-legged Kittiwake RAS colour ringing project was successfully completed for a fifth consecutive year at North Landing, Flamborough this summer. Resighting effort commenced in early-April, although nest building was slow to get going. A total of 97 individuals were resighted from a potential 130 colour ringed birds (51 adults from 2018, 60 adults from 2019 and 19 adults in 2020). Resighting visits were made weekly through to mid-August with occasional new birds noted. No additional birds were added to the project this season.

Recreational disturbance

In 2022, the newly formed Yorkshire Marine Nature Partnership (YMNP), in collaboration with the RSPCA, Humberside and North Yorkshire Police forces and other key partners continued the work of Operation Seabird. Since its launch in August 2020, Operation Seabird has held a number of successful 'awareness day's' and media campaigns to engage the public and raise awareness of disturbance caused by recreational activities. The success of Operation Seabird has seen the initiative launch nationally in other areas of UK coastline and has proven to be a useful tool in encouraging responsible use of the marine environment. Going forward, it is hoped to continue Operation Seabird's success into 2023 by continuing to build positive relationships with user groups, raise awareness of recreational disturbance and look towards targeted engagement and hosting workshops.

Flamborough and Filey Coast SPA whole colony count

A land and boat-based whole colony count was successfully completed this summer. The results suggest that the overall health of the breeding seabird assemblage is positive, although the population trends of individual species portray a mixed picture. The results of the whole colony count are detailed in a separate report (Clackson et al. 2022).

INTRODUCTION

Background

Seabird population data has been collected within the Special Protection Area (SPA) since at least 1969. In 1969, all species but Shag and Puffin were counted as part of the 'Operation Seafarer' national seabird census. In 1987, all species were counted during the 'Seabird Colony Register' census. All species were counted in 2000 for the 'Seabird 2000' census, again in 2008, and in 2017 as part of the 'Seabirds Count' national seabird census. Whole colony counts of Gannet were also completed in 1970-77, 1985-94, 1996-99, 2002, 2004-05, 2008-09, 2012 and 2015. In addition, whole colony counts for Herring Gull were completed in 2010 and 2014 and for Shag in 2014.

Before the commencement of the Flamborough Head and Bempton Cliffs seabird monitoring programme in 2009, breeding success data for Flamborough/Bempton was collected for Gannet during 1973-79, 1986-94, 1996-98, and 2006. Kittiwake breeding success has been monitored continuously since 1986. Guillemot productivity was monitored during 1991-98 and 2005-06 and Razorbill productivity was monitored in 2005-06. Fulmar and Herring Gull breeding success were monitored for the first time in 2009 and is ongoing. Unfortunately, it is not possible to monitor breeding success for Puffin at this vertical cliff-nesting colony and only limited monitoring of Shag and Cormorant nests is possible depending on nest site selection.

At Filey, a whole colony count was carried out in 1986 (Williams 1996). In 2002 the 'Seabird 2000' census team identified a significant colony of cliff-nesting seabirds on the cliffs to the north of Filey Bay (Mitchell et al. 2004). The significance of this colony came to light in 2008 in response to large numbers of Guillemot and Razorbill being caught and killed in gillnets set by fishermen in Filey Bay. It was recognised that birds caught in the nets could have originated from either the Flamborough/Bempton or Filey colonies. Unfortunately, at that time there was little current data about the state of the colony at Filey.

The Flamborough and Filey Coast SPA Seabird Monitoring Programme

Flamborough and Filey Coast SPA supports the largest mainland seabird colony in England, the only mainland gannetry in England and one of the largest mainland Kittiwake colonies in the UK. The landward boundary of the SPA generally follows the coast at Flamborough Head from South Landing in the south, to Speeton in the north, with an additional section from the forefront of Filey Brigg headland to Cunstone Nab. The seaward boundary extends approximately 2 km parallel to the coast from the landward boundaries before moving seawards and extends approximately 2 km into the marine environment (see maps in Appendix 1).

Flamborough Head is a highly protected site both for its wildlife and unique chalk habitats. The site is designated as a European Marine Site (EMS), a Special Area of Conservation (SAC), a Special Protection Area (SPA), a Site of Special Scientific Interest (SSSI) and a Heritage Coast site which includes three Local Nature Reserves (LNR), as well as RSPB Bempton Cliffs Nature Reserve and the Yorkshire Wildlife Trust Flamborough Cliffs Nature Reserve.

At the northern end of the SPA the Filey Brigg SSSI falls within the SPA and the Gristhorpe Bay and Red Cliff SSSI is just to the north of the SPA.

The Flamborough and Filey Coast SPA qualifies under Article 4.2 of the EU Birds Directive for the following reasons:

- It supports over 1% of the biogeographical population of four regularly occurring migratory species: Black-legged Kittiwake (*Rissa tridactyla*); Northern Gannet (*Morus bassanus*); Common Guillemot (*Uria aalge*); and Razorbill (*Alca torda*).
- It supports a breeding seabird assemblage of European importance; during the breeding season the area regularly supports up to 300,000 breeding seabirds.

Due to the importance of the seabird colony and level of site protection, Natural England and the RSPB proposed in 2008 a project to enable a baseline count, population monitoring and further research to collect data on the health of the colony and the Flamborough Head and Bempton Cliffs SPA and underpinning SSSIs. This proposal led to the establishment of the Flamborough Head and Bempton Cliffs seabird monitoring programme, which began with the 2009 seabird breeding season.

In 2009 there was also evidence to suggest that the cliffs 5 km northwest of Bempton supported a sizeable colony that might also meet the EU Birds Directive criteria. A boat-based whole colony count of the breeding seabird assemblage nesting on the cliffs between Filey Brigg and Cayton Bay was carried out by the RSPB. The results suggested that the total number of breeding seabirds in this colony exceeded 20,000 birds, and therefore this site also met SPA qualifying criteria. In response to this evidence the RSPB, with funding support from Natural England, completed five consecutive years of colony count data to verify these findings. This data supported the proposed extension of the existing Flamborough Head and Bempton Cliffs SPA to include Filey Cliffs to create the Flamborough and Filey Coast SPA, which was formally designated in November 2018.

The data collected by the now enlarged Flamborough and Filey Coast seabird monitoring programme will inform the condition and management of the Flamborough and Filey Coast SPA and underpinning SSSIs. In addition, the results will also inform current and new planning enquiries and environmental assessments e.g. the Hornsea and proposed Dogger Bank offshore wind arrays that could have a detrimental impact on the features of the designated site. It is also hoped that seabird tracking data collected from the colony will inform potential new offshore MPAs.

Data collected will also be used to inform the Seabird Monitoring Programme (SMP) coordinated by the British Trust for Ornithology (BTO), the RSPB Annual Reserves Monitoring programme, the RSPB Bempton Cliffs reserve management plan and the Yorkshire Wildlife Trust's reserve management.

The key aims of the seabird monitoring programme, and how they are currently implemented, are as follows:

- **Understanding variation and trends in seabird productivity**
Northern Fulmar, Northern Gannet, Black-legged Kittiwake, European Herring Gull, Common Guillemot and Razorbill plots have been monitored for breeding productivity annually since 2009.
- **Understanding population numbers and trends**
Black-legged Kittiwake, Common Guillemot and Razorbill study-plot counts have been carried out annually since 2009. A whole colony census was carried out in 2008 and repeated in 2017 and 2022. It is intended that a whole colony count be completed every five years within the reserve's management plan cycle.
- **Understanding the relationship between the colony and the larger marine environment**
As the relevant technologies improve, we hope to better understand foraging behaviours of birds breeding in the colony and to identify preferred foraging areas and trends in provisioning such as determining key feeding areas for key species, and the factors that influence their location. This includes ongoing seabird tracking, currently focused on Black-legged Kittiwake, and monitoring of Common Guillemot and Razorbill diet composition. In the future this could extend to range finders, remote tracking, and increased use of fish population modeling data and benthic mapping.
- **Understanding how RSPB Bempton Cliffs relates to wider SPA and potential impacts on disturbance by developing research proposals to address the following management issues**
What are the types of human activities that could disturb the colony and what are their effects? Currently recreational disturbance is monitored and recorded by Bempton Cliffs and others on an ad-hoc basis. For those activities that are of particular concern, we hope to develop specific research proposals which assess level of impact.

The annual programme of monitoring is coordinated by the RSPB Bempton Cliffs seabird team lead by the reserve Warden, a Seabird Research Assistant and a team of dedicated volunteer seabird researchers including members of Flamborough Bird Observatory (FBO) and Filey Bird Observatory & Group (FBOG).

The results of the 2022 Flamborough and Filey Coast SPA Seabird Monitoring Programme are detailed in this report. Access to the monitoring data is available to researchers and conservation organisations by agreement with RSPB.

PRODUCTIVITY MONITORING

Detailed productivity monitoring was completed for the fourteenth consecutive year for six of the nine breeding seabird species found in the colony: Fulmar, Gannet, Kittiwake, Herring Gull, Guillemot and Razorbill. In addition, a single Shag nest at Flamborough Head was monitored again this year, and monitoring of a small number of Cormorant nests continued at Filey. Unfortunately, it is not possible to monitor Puffin productivity at this vertical cliff-nesting colony.

The Flamborough and Filey Coast SPA seabird monitoring programme follows the methods and guidelines set out in the '*Seabird monitoring handbook for Britain and Ireland*' (Walsh et al. 1995), "the Handbook" hereafter, which summarises census and productivity monitoring techniques for seabirds at colonies in Britain and Ireland. All productivity monitoring is based on marking Apparently Occupied Sites (AOS) or Apparently Occupied Nests (AON) on a laminated photograph of the relevant plot. Please refer to the Handbook for more details on methodologies for each species and survey undertaken.

The productivity monitoring plots were identified when the Flamborough Head and Bempton Cliffs seabird monitoring programme was established in 2009. Plots were selected with a view to providing, where possible, a sample size in the region of 50 AOS or AON per plot and a minimum sample of 250 AOS/AON for each species, while providing safe vantage points for the observer with little or no disturbance to breeding seabirds. In 2011, five additional monitoring plots for Kittiwake were established at Filey Cliffs in conjunction with the census work there which led to the extension of the Flamborough Head and Bempton Cliffs SPA to include Filey Cliffs; in 2014 one of the original plots was dropped as it was too difficult to observe and an additional monitoring plot added on Filey Brigg. In 2017, two additional Fulmar plots were added at Cunstone Nab at the north end of Filey Cliffs in an effort to extend the monitoring of other species to Filey. A further Fulmar plot was added from Thornwick in 2021, as it provided a reasonable number of AOS that were easily monitored. Indicative maps of the productivity plot locations are included in Appendix 2.

As recommended by the Handbook, we present productivity calculated as the mean of the individual plot results for each species as well as presenting species productivity data by aggregating the results of each plot (total chicks fledged / total nests (or sites) monitored).

Northern Fulmar *Fulmarus glacialis*

All eight productivity plots were monitored this year, with ongoing cliff-top erosion at Swineshaw Hole necessitating monitoring to take place from a more seaward position than had previously been used.

Plots were photographed in early May and AOS marked on laminated photographs over three visits over the late May/early June period. A final visit was made in early-mid August and large chicks present at that time are assumed to have fledged. The Cunstone Nab plots were photographed at a larger scale this season to aid accurate recording of AOS on parts of these distant plots.

The mean productivity for Fulmar was 0.44 (SE \pm 0.0415) chicks per AOS. A total of 138 AOS were monitored across all eight plots, from which 54 chicks successfully fledged (Table 1, Figure 2). This is the lowest productivity recorded to date, the previous lowest being 0.47 in 2018.

Table 1: Northern Fulmar productivity results 2022. Plots added in 2017 are marked* and in 2021 marked**

Plot	AOS	Chicks fledged	Productivity ch/pr
New Roll-up	5	2	0.40
Old Dor	15	5	0.33
Newcombe	7	4	0.57
Breil Nook	7	4	0.57
Swineshaw Hole	14	7	0.50
Thornwick**	17	9	0.53
Cunstone Nab A*	39	14	0.36
Cunstone Nab B*	34	9	0.26
Total	138	54	0.39
Mean of plot results \pm SE			0.44 \pm 0.0415
Aggregate productivity			0.39
Original plots aggregate			0.57
Mean of original plots		0.48	\pm 0.1060 SE

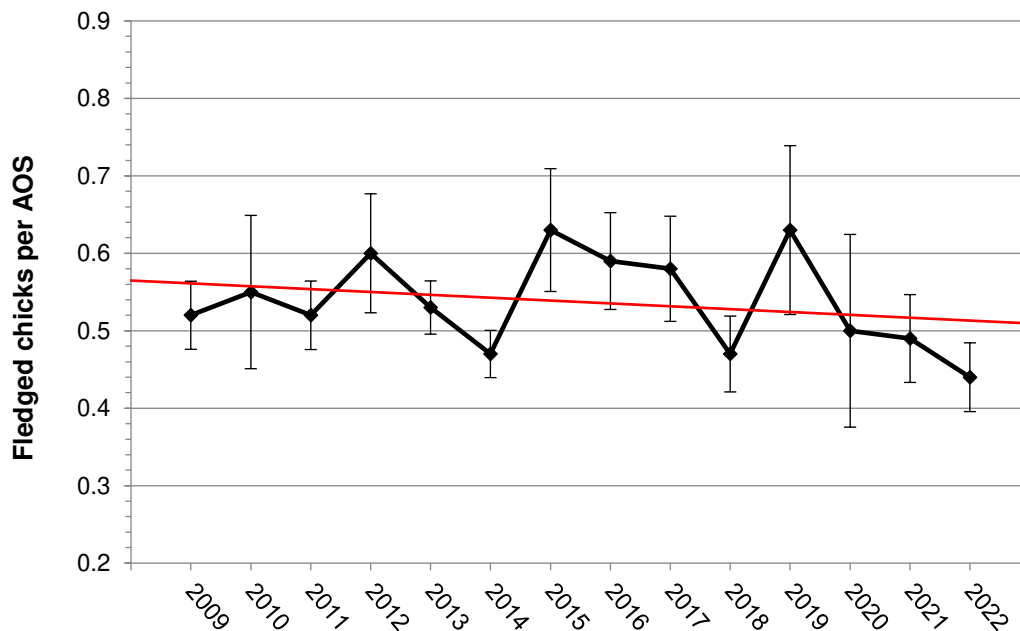


Figure 2: Northern Fulmar productivity 2009-2022, mean of plot productivity results plus/minus SE. N.B.: The mean productivity from 2017 onwards includes plots from Filey, and an additional plot at Flamborough Head added in 2021.

Fulmar productivity dipped for the third consecutive year, following a good year in 2019. There was a slight difference between the mean and aggregate values (0.44 and 0.39 respectively), with a low standard error, with variation in plot results, ranging from 0.26 to 0.57 chicks fledged per pair. From 2017 the two Filey plots, Cunstone Nab A and B, were included in the mean and aggregate productivity values. The Thornwick plot is likewise included from 2021 and showed reasonable productivity at 0.53 chicks/pair.

Northern Gannet *Morus bassanus*

Five productivity plots were monitored between late April and October. Plots were photographed in mid to late April and up 60 AON were marked on laminated photographs. The plots were then visited every 7-10 days. Average visit time early in the season was 2 to 2.5 hours per plot but reduced dramatically once chicks got larger and were more visible. Presence of an egg or chick is then recorded (if seen) each visit.

The mean productivity for Gannet was 0.36 (SE ± 0.1256) chicks per AON. A total of 267 AON were monitored across the five plots, from which only 99 chicks successfully fledged (Table 2, Figure 3).

Table 2: Northern Gannet productivity 2022.

Plot	AON	Chicks fledged	Productivity ch/pr
Jubilee Corner	48	32	0.67
Nettletrip	61	40	0.66
Staple Newk 1	54	9	0.17
Staple Newk 2	49	3	0.06
Staple Newk 3	55	15	0.27
Total	267	99	
Mean of plot results ± SE			0.36 ± 0.1256
Aggregate productivity			0.37

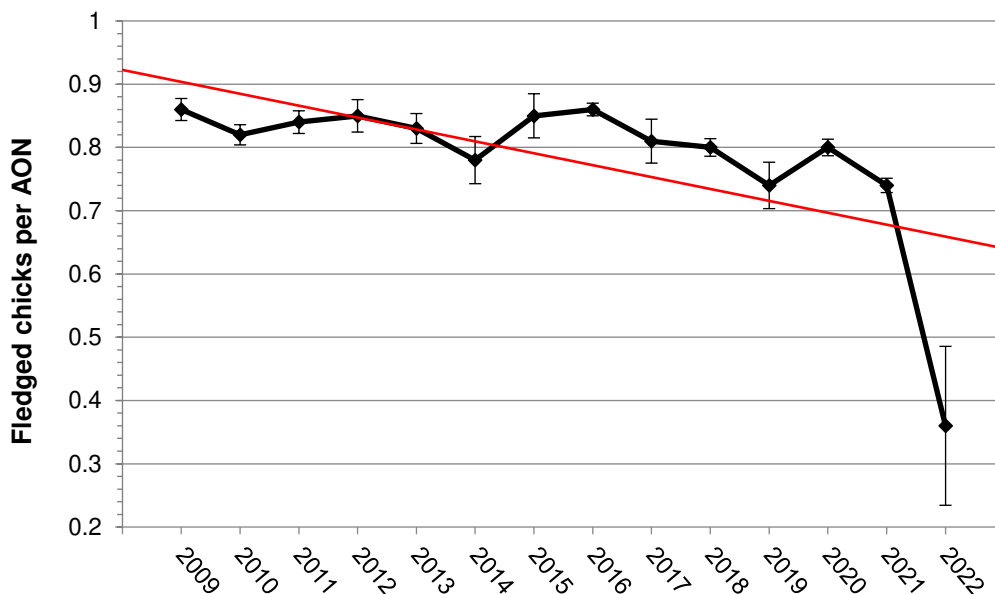


Figure 3: Northern Gannet productivity 2009-2022, mean of plot results plus/minus SE.

Gannet productivity was the lowest ever recorded, with 0.36 chicks fledged per pair. There was a significant difference between the Staple Newk plots and those at Jubilee and Nettletrip. This was considered to highlight the impact of HPAI, and in particular, the orientation of the cliffs. The flatter areas at Staple Newk being the most conducive to the virus spreading, whereas the nests on the vertical cliffs at Jubilee and Nettletrip fared much better. It should be noted that the productivity of 0.67 recorded at Jubilee, still represents the lowest ever for that plot, the previously lowest being 0.72 recorded in 2015. Likewise, Nettletrip productivity was 0.66, which is the second lowest to 0.65 recorded in 2014. These figures suggest that although there was no visual impact of HPAI on birds at the northern end of the colony, it still had some impact.

European Shag *Phalacrocorax aristotelis*

The regular area at Breil was monitored and used by just a single pair, which went on to fledge a single chick. The other sites showed no breeding activity at all. This decline in the breeding population was reflected in the whole colony count, with just 17 AON recorded this summer.

Great Cormorant *Phalacrocorax carbo*

For the second year running a small plot was monitored along Filey Cliffs. A total of eleven AON fledged twenty-five chicks, giving a productivity of 2.27 chicks/pair. This is slightly down on three chicks/pair in 2021. However, the number of nests was more than double the 2021 total monitored. These represent just over a third (34%) of the breeding population of 32 AON recorded during this year's whole colony count.

Black-legged Kittiwake *Rissa tridactyla*

Nineteen productivity plots were monitored across the SPA between May and August: 16 plots between Flamborough and Bempton and three plots at Filey. Following the successful redesignation of the SPA in 2018, the Filey plots have been included in the productivity calculations with Flamborough and Bempton from 2012 onwards.

Plots were photographed in early to mid-May and up to 60 AON were marked on laminated photographs. Plots are then visited every week, ideally on the same day so visits are seven days apart. Presence and number of eggs or chicks at each AON are recorded (if seen) each visit. Volunteers were asked to record chick size using standard codes, but not all do. Average visit times varied according to the volunteer, but 1 to 1.5 hours per visit was typical.

Unfortunately, the unstable cliffs at Swineshaw Hole continued to fall away over the winter and has resulted in the footpath being moved inland by a few metres and a fence being erected to keep people away from the edge. This now means that the monitoring plot is very distant from a safe viewpoint and as such is unlikely to be monitored again.

The mean productivity for Kittiwake across the SPA was 0.87 (SE \pm 0.0325) chicks per AON. A total of 968 AON were monitored across 19 plots, from which 849 chicks successfully fledged (Table 3, Figure 4).

Table 3: Black-legged Kittiwake productivity 2022.

Plot	AON	Chicks fledged	Productivity ch/pr
Jubilee Far	50	39	0.78
Bartlett Nab Near	50	41	0.82
Bartlett Nab Far	50	40	0.80
Grandstand North Near	50	30	0.60
Grandstand North Mid	50	45	0.90
Grandstand North Low	50	36	0.72
Old Dor	47	43	0.91
Newcombe	50	44	0.88
Back of Newcombe	56	59	1.05
Carter Lane 1	51	49	0.96
Carter Lane 2	49	44	0.90
Saddle Nook 2	50	52	1.04
Saddle from Breil	47	46	0.98
Breil Nook North	50	53	1.06
Breil Nook South	47	34	0.72
Back of Breil Nook	68	77	1.13
Filey plot 1	48	39	0.81
Filey plot 7	50	39	0.78
Filey plot 8	55	39	0.71
Total	968	849	
Mean of plot results ± SE			0.87 ± 0.0325
Aggregate productivity			0.88

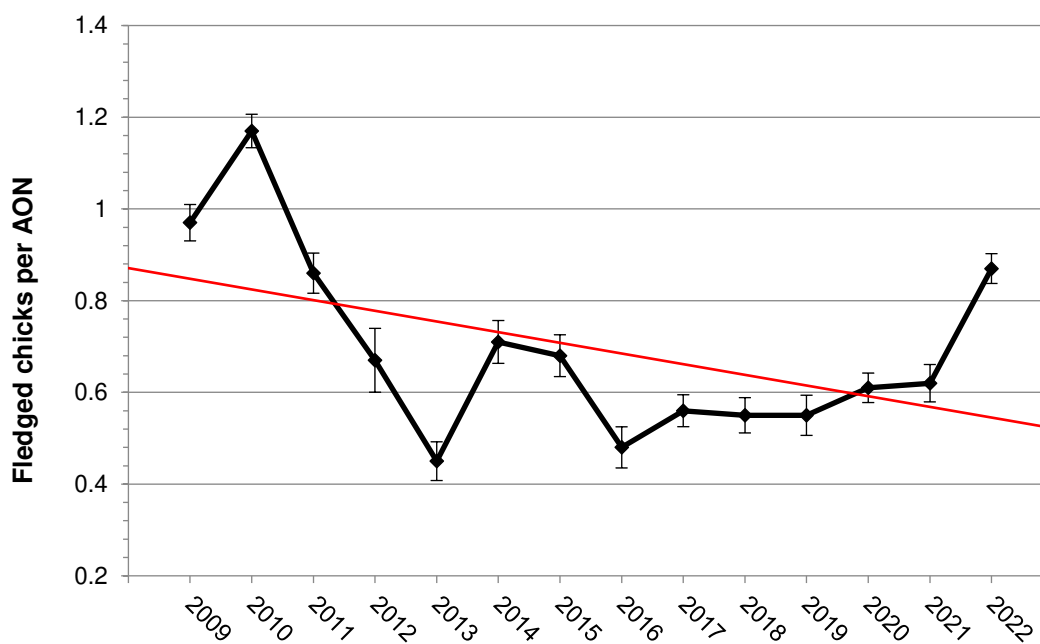


Figure 4: Black-legged Kittiwake productivity 2009-2022. Mean of plot results, plus/minus SE.
N.B.: Data between 2009-2011 are the mean of plots results for Flamborough and Bempton, from 2012 onwards the data include Filey.

Kittiwake had an encouraging season with the highest mean productivity since 2010. Plots at Filey and Bempton showed very similar productivity of 0.77 and 0.79 chicks per pair respectively, whilst Flamborough was slightly higher at 0.97 chicks per pair, the highest since 2010. For Bempton Cliffs this was the highest since 2015. Filey continues to build on the increasing levels of productivity shown in 2021, having had two successive years of the highest recorded productivity considering that monitoring only began at Filey in 2012 (Figure 5). It should be noted that the Cunstone Nab plots were in severe decline or abandoned, being last monitored in 2016 (both) and one in 2019, without Cunstone in 2019 productivity at Filey would have been 0.64.

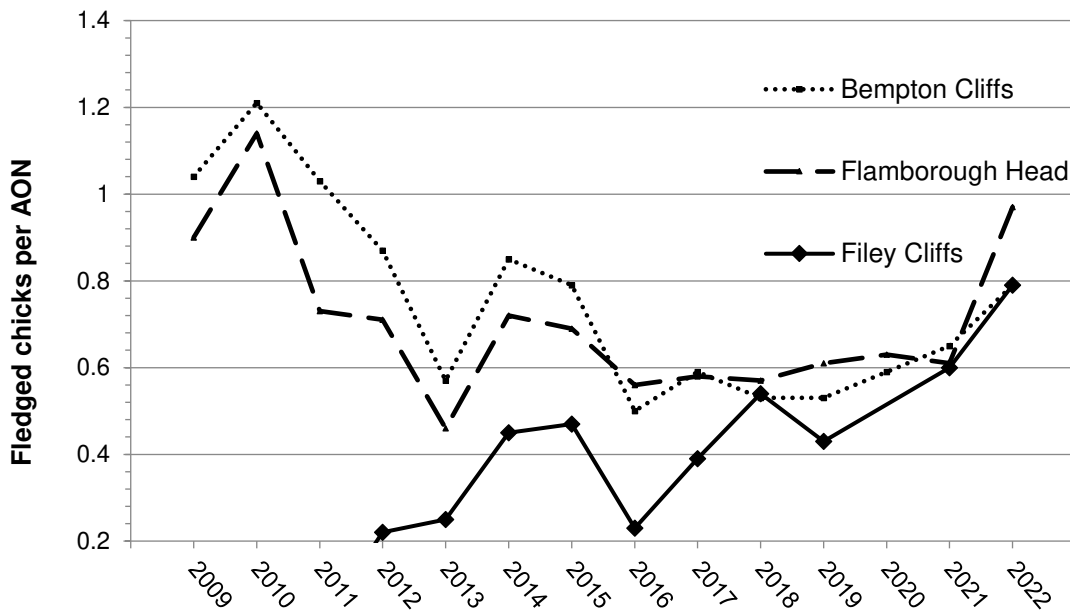


Figure 5: Black-legged Kittiwake productivity 2009-2022 comparing plots between Bempton Cliffs (dotted line), Flamborough Head (dashed line) and Filey Cliffs (solid line). Results for each year is the mean of the relevant plot results.

European Herring Gull *Larus argentatus*

Five Herring Gull productivity plots were monitored between May and August. Two of the plots are linear and include all safely observable nests found on a defined stretch of cliff. One linear plot is at Bempton Cliffs and one is at Flamborough Head. Plots were photographed in late-May and AON marked on laminated photographs over two visits. Additional AON were added over the course of the season. Plots were then visited once a week, ideally on the same day so visits were seven days apart. Presence and number of eggs or chicks for each AON is recorded (if seen) each visit. Chicks were aged using standard codes to assess fledged or failed birds more precisely.

The mean productivity for Herring Gull was 0.25 (SE ± 0.0931) chicks per AON. A total of 80 AON were monitored across 5 plots, from which just 23 chicks fledged successfully (Table 4, Figure 6).

Table 4: European Herring Gull productivity 2022.

Plot	AON	Chicks fledged	Productivity ch/pr
Jubilee to Old Dor	15	5	0.33
Newcombe North	5	0	0.00
The Saddle Rock	28	11	0.39
Breil Nook Stack	13	6	0.46
Newcombe to Breil	19	1	0.05
Total	80	23	
Mean of plot results ± SE			0.25 ± 0.0931
Aggregate productivity			0.29

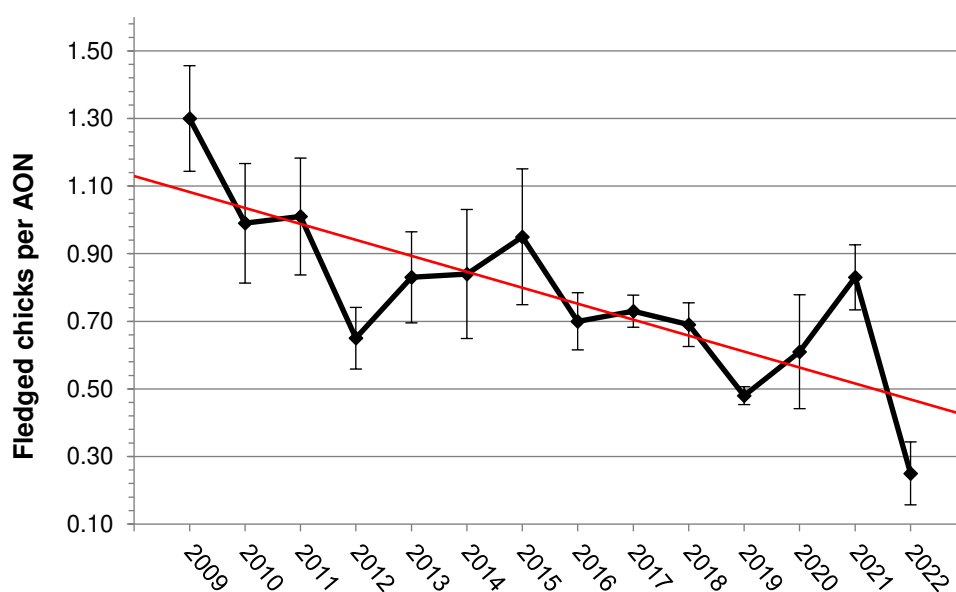


Figure 6: European Herring Gull productivity 2009-2022, mean of plot results plus/minus SE.

Following a reasonable year in 2021, Herring Gull had their lowest ever productivity this season. This continues the ongoing declining trend (Figure 6). Newcombe North colony was a complete failure with no chicks fledging at all from five AON.

A total of 80 AON across all monitoring plots reflected an average number of nests monitored (Figure 7). Vegetation growth hampered monitoring at a couple of sites and on the reserve, Gannet were present on a site which held nesting Herring Gull in 2021.

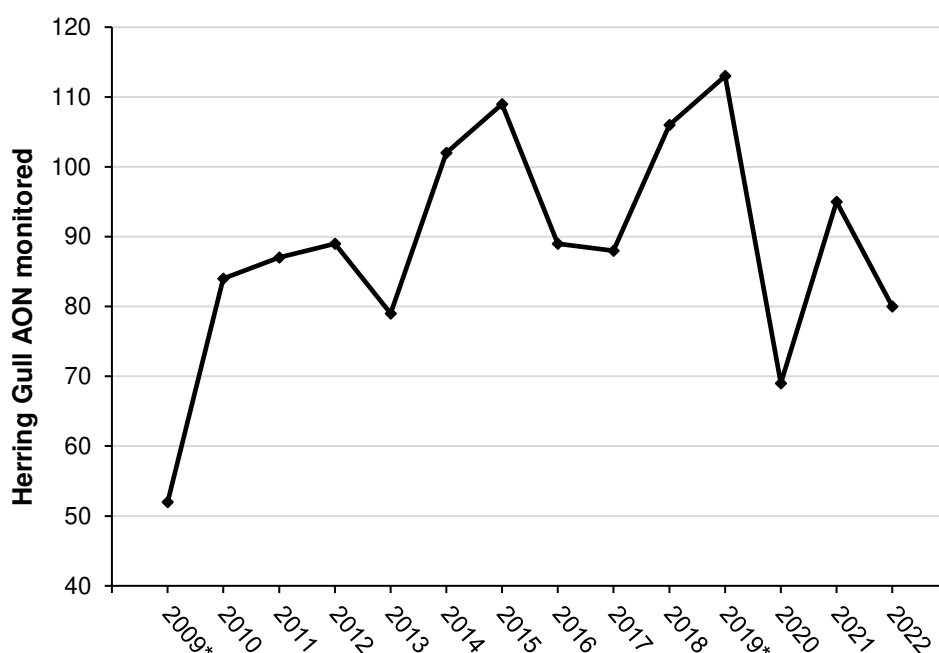


Figure 7: Number of European Herring Gull AON monitored 2009-2022.
 N.B.: In 2009, only three plots were monitored and in 2019, six plots were monitored.

Common Guillemot *Uria aalge*

Five productivity plots were monitored between early May and the end of July. Plots were photographed in early May and up to 60 AOS were marked on laminated photographs over two visits. Plots were then visited every third day. Additional sites may have been added over the course of the season, especially if it was hard to get 50 AOS. Presence of an egg or chick was recorded (if seen) each visit. Average visit time early in the season was 2 to 2.5 hours but reduced once chicks got larger and were more visible.

The mean productivity for Guillemot was 0.61 (SE \pm 0.0618) chicks per AOS. A total of 272 AOS were monitored across five plots, from which 165 chicks successfully fledged (Table 5, Figure 8).

Table 5: Common Guillemot productivity 2022.

Plot	AOS	Chicks fledged	Productivity ch/pr
Nettletrip	55	25	0.45
Grandstand North	58	29	0.50
Grandstand South	-	-	-
Carter Lane 1	52	32	0.62
Carter Lane 2	52	35	0.67
Breil Nook	55	44	0.80
Total	272	165	
Mean of plot results \pm SE			0.61 \pm 0.0618
Aggregate productivity			0.61

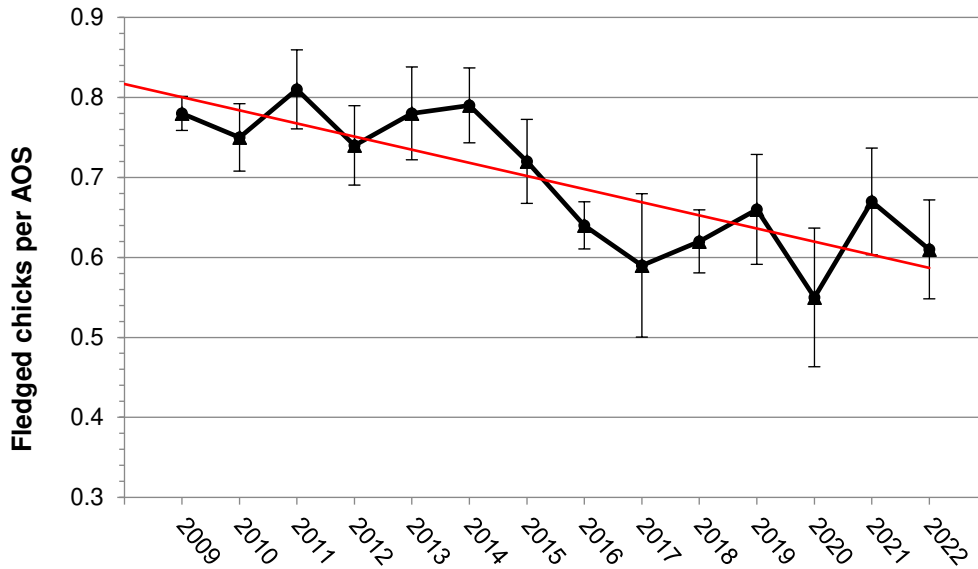


Figure 8: Common Guillemot productivity 2009-2022, mean of plot results plus/minus SE.

Guillemot productivity dropped in 2022 after a better year in 2021 (Figure 8). Displacement by Gannet and Carrion Crow predation were considered to be responsible for the low success rate on the reserve plots, and as such the results may not reflect what is happening across the wider colony.

There were 116 failures recorded across the five plots. A failure rate of 49% at egg incubation stage was similar to 2021, however failures at chick rearing stage dropped to 29% whilst 22% failed to produce either an egg or chick. This latter figure is double the percentage from 2021. The impact of these failures at egg stage is particularly apparent when comparing figures at Bempton Cliffs (70%) with those from Flamborough Head (19%).

The difference in productivity remains apparent between the Flamborough Head and Bempton Cliffs sections of the colony, with productivity dropping at a similar level across both this season (Figure 9). Incidences of conflict with Gannet at Nettletrip and Grandstand North increased, being directly responsible for at least nine of the failures at Nettletrip. Additionally, at Nettletrip a Carrion Crow was observed to drag an incubating Guillemot from the cliff and fly off with its egg before the adult could return to its site.

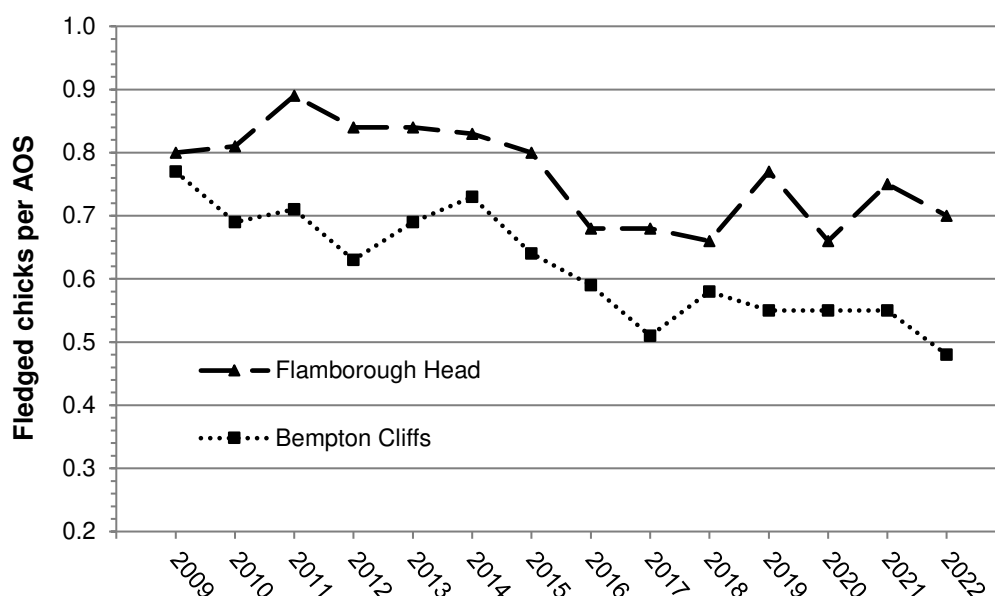


Figure 9: Comparing Common Guillemot productivity plots against Flamborough Head (dashed line) and Bempton Cliffs (dotted line) between 2009-2022. Results for each year are the mean of the relevant plot results.

Razorbill *Alca torda*

Five productivity plots were monitored between early May and the end of July. Plots were photographed in early May and up to 60 AOS were marked on laminated photographs over two visits. Plots were then visited every third day. Additional sites could be added over the course of the season, especially if it was hard to get 50 AOS. Presence of an egg or chick was recorded (if seen) each visit. Average visit time early in the season was 2 to 2.5 hours but reduced once chicks got larger and were more visible.

The mean productivity for Razorbill was 0.45 (SE \pm 0.0723) chicks per AOS. A total of 224 AOS were monitored across five plots, from which 112 chicks successfully fledged (Table 6, Figure 10).

Table 6: Razorbill productivity 2022.

Plot	AOS	Chicks fledged	Productivity ch/pr
Grandstand Gully	25	6	0.24
Grandstand North	42	18	0.43
Grandstand South	37	12	0.32
Breil Nook	57	44	0.77
Swineshaw Hole	63	32	0.51
Total	224	112	
Mean of plot results \pm SE			0.45 \pm 0.0723
Aggregate productivity			0.50

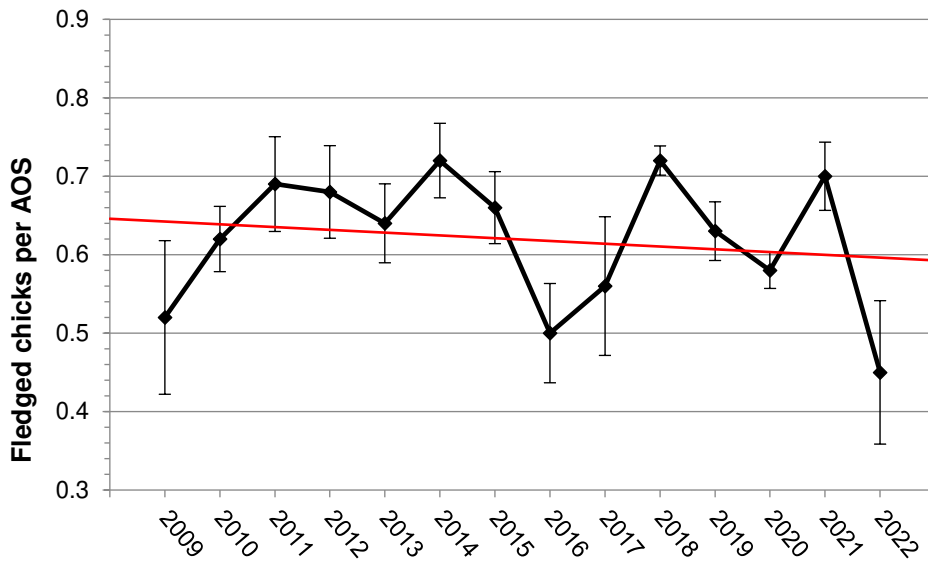


Figure 10: Razorbill productivity 2009-2022, mean of plot results plus/minus SE.

Razorbill productivity fell dramatically in 2022, to its lowest level since 2009. As a result, the general trend is now for a slight decline. The lowest productivity was once again the Grandstand Gully plot (0.24 chicks/pair), which whilst at a very low level, has been recorded previously in 2016 (0.24) and 2017 (0.15). Productivity at the reserve in general was particularly low, with Carrion Crow activity being noted frequently in the vicinity of Grandstand. This pair successfully fledged young and likely had a local impact on productivity, which is evident when compared with the productivity at Flamborough Head (Figure 11). Corvid activity was linked to the poor productivity shown in both 2016 and 2017 as can be seen in the same figure. It is also likely there was some conflict with Kittiwake and Guillemot being recorded on Razorbill AOS.

One hundred-twenty failures were recorded across the five monitoring plots. Of those, 50% were at the egg stage, 35% were during the chick rearing stage and 15% were apparently occupied sites that did not go on to produce an egg or chick. There were big differences between the Bempton Cliffs and Flamborough Head plots and between the plots themselves. At Bempton Cliffs, 24% of sites failed to produce either an egg or chick, whereas at Flamborough Head this was just 4%. Grandstand Gully represented the highest plot for egg failure with 63%, whilst the Grandstand South plot had the lowest egg failure rate at 40%.

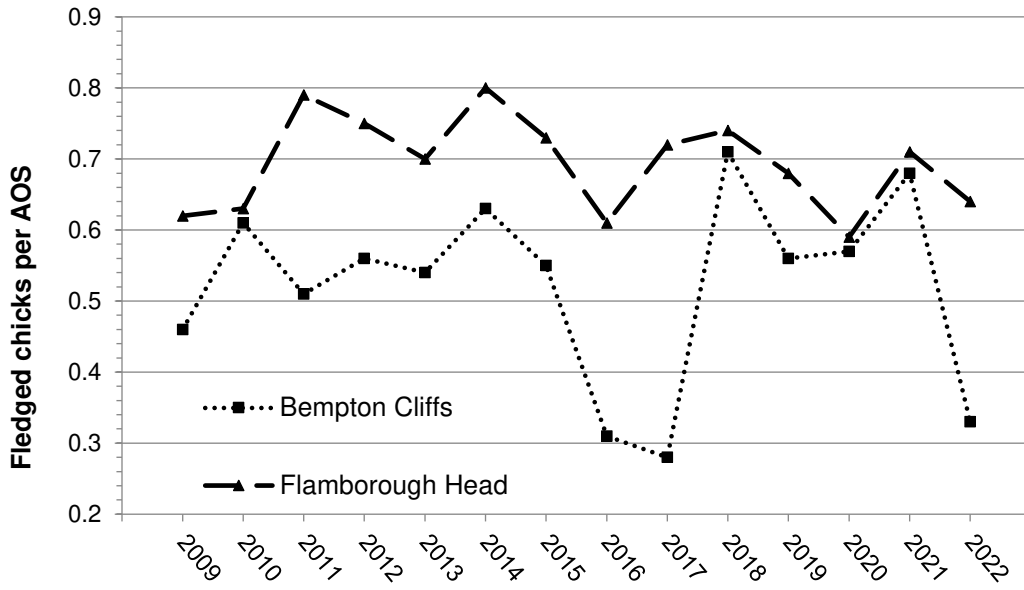


Figure 11: Comparing Razorbill productivity plots against Bempton Cliffs (dotted line) and Flamborough Head (dashed line) between 2009-2022. Results for each year is the mean of the relevant plot results.

EARLY SEASON ATLANTIC PUFFIN SURVEY

A pre-season Atlantic Puffin survey has been carried out or attempted for the last seven years, in an effort to study broad scale population trends across the Flamborough and Filey Coast SPA. The methodology for this survey is based on advice from Professor Mike Harris, who recommended that we count adults staging on the sea when large numbers of birds return to the colony en masse at the very start of the season (M Harris pers. Comm., 2016). This cannot be considered an accurate census of the breeding population; however, it is useful to observe large scale year-on-year changes.

Settled weather, birds and plenty of surveyors meant the early season survey was successfully completed on 15 March. The table below shows the results compared to data for 2016 – 2018, when successful counts were completed (Table 7).

Table 7: Results of the early season Atlantic Puffin survey 2016-2022.

*N.B.: *Estimated that several hundred birds were on the cliffs along the length of the colony; these were not included in the survey.*

	Flamborough Head to Thornwick	Thornwick to Speeton	Filey	SPA Total (not incl Filey)	SPA Total
2016	805	1462	n/a	2267	n/a
2017	712	1924	243	2636	2879*
2018	493	3612	174	4105	4279
2022	581	2405	94	2986	3080

STUDY-PLOT COUNTS

The size and nature of the Flamborough and Filey Coast SPA colony means that it is not practicable to conduct annual whole colony population monitoring. Accordingly, study-plots for population monitoring of Kittiwake, Guillemot and Razorbill were established at Flamborough and Bempton in 2009. Plots were selected to be dispersed through the colony as randomly as possible given the need to provide a safe vantage point and minimise disturbance to breeding birds. Counts have been conducted annually since 2009, with the exception 2011, when counts of Guillemot and Razorbill were abandoned due to an early breeding season.

For each species the same plots are used each year as required by the Handbook; plot boundaries, based on clear cliff features, are marked on laminated photographs of the relevant area of cliff. Indicative maps of the study-plot locations at Flamborough and Bempton are included in Appendix 3.

The Handbook suggests that study-plot counts are not recommended for general use when counting Kittiwake, however, as the SPA holds one of the largest mainland populations in the UK, it is important that trends are monitored.

The study-plot count results continue to be encouraging for all species. The mean Kittiwake count of 1871 AON was 52 AON higher than in 2021 and continues a stable long-term trend. The mean Guillemot count of 1560 IND was the second highest mean total, being just 23 birds fewer than in 2021. The mean Razorbill count continues to reach new levels for the seventh successive year, with 1065 IND recorded. (Figure 12).

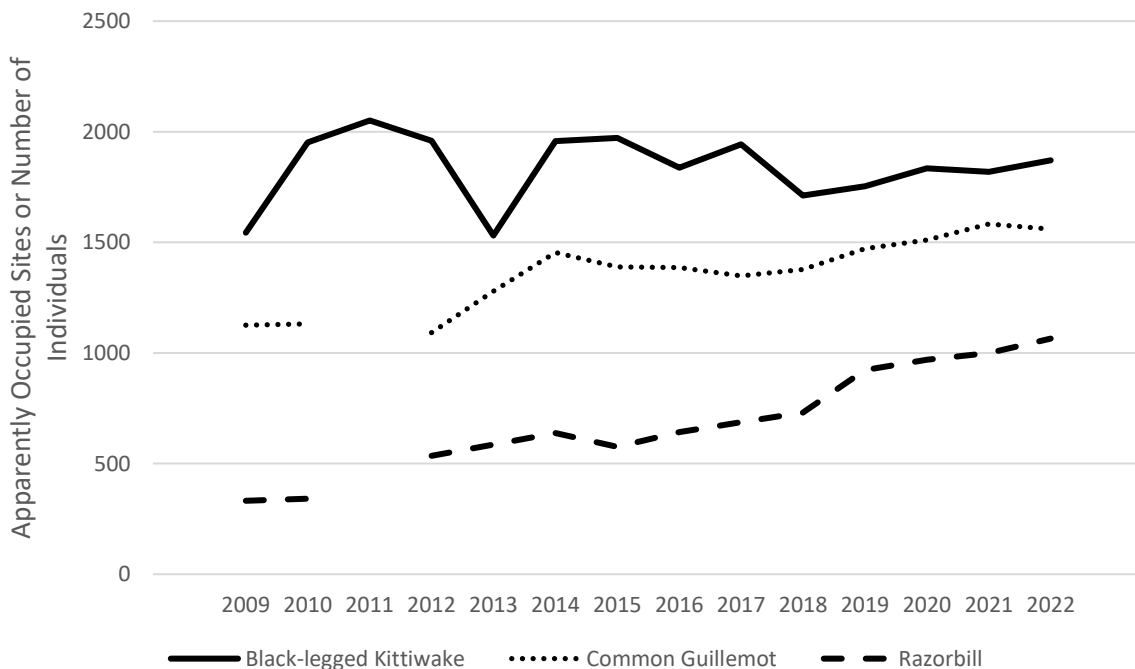


Figure 12: Historic study-plot count results for Black-legged Kittiwake, Common Guillemot and Razorbill from 2009-2022 at Flamborough Head and Bempton Cliffs.

N.B.: Black-legged Kittiwake counted as AON, Common Guillemot and Razorbill counted as individuals (IND).

Black-legged Kittiwake study-plot counts

Seven study-plots were counted between 0800 and 1600 on at least two occasions during the period 1 June to 22 June. The mean of the two counts was 1871 AON (Table 8), this represents the highest total since 2015. As with recent years the second count was higher than the first.

Table 8: Black-legged Kittiwake study plot count results - last 5 years

Visit	2018 AON total	2019 AON total	2020 AON total	2021 AON total	2022 AON total
1	1733	1802	1812	1801	1849
2	1688	1705	1858	1837	1893
Mean	1711	1754	1835	1819	1871

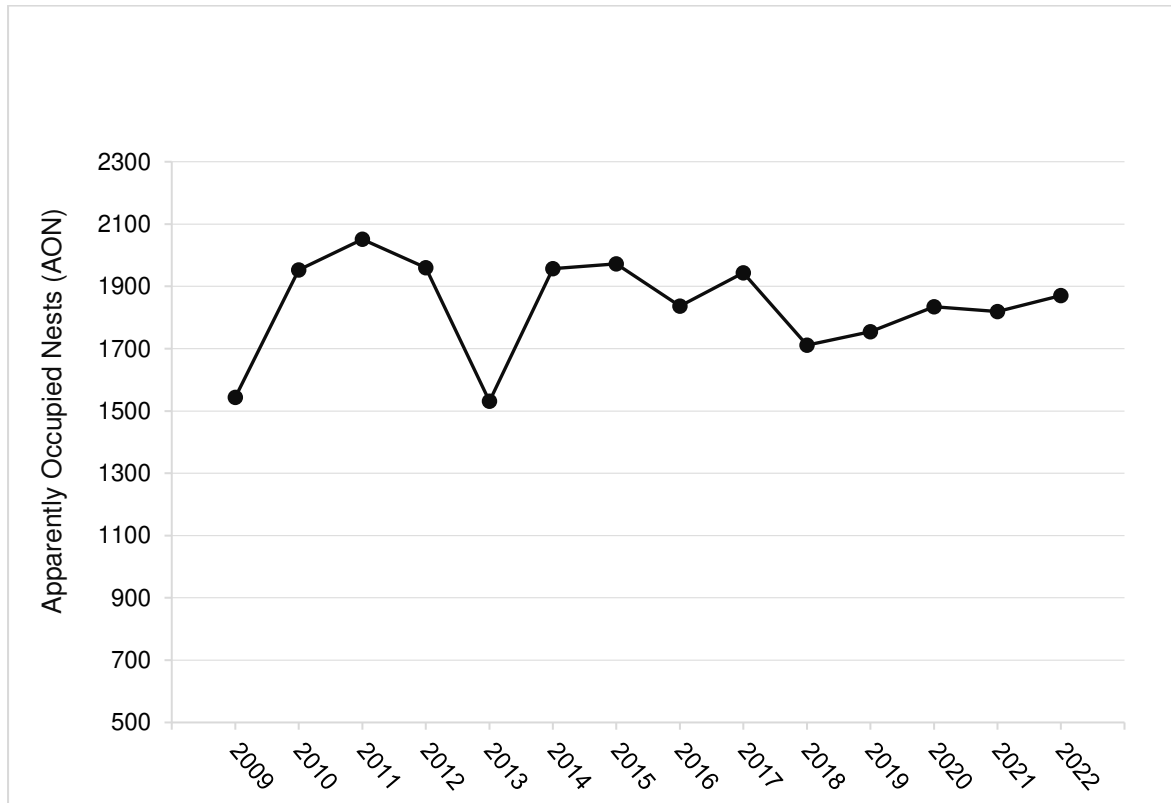


Figure 12: Number of Black-legged Kittiwake AON from 2009-2022 across seven study-plot areas.

Common Guillemot study-plot counts

Seven study-plots were counted between 0800 and 1600 on five occasions during the period 1 June to 22 June. The mean of the study-plot counts for Guillemot was 1560 IND (Table 9). This is a slight decrease on the 2021 total of 1583, and the first year since 2017 the count has decreased.

Table 9: Common Guillemot study plot count results - last 5 years

Count	2018 IND total	2019 IND total	2020 IND total	2021 IND total	2022 IND total
1	1265	1486	1505	1574	1710
2	1363	1416	1417	1694	1594
3	1424	1428	1555	1526	1560
4	1460	1553	1528	1580	1440
5	1372	1478	1546	1540	1498
Mean	1377	1472	1510	1583	1560

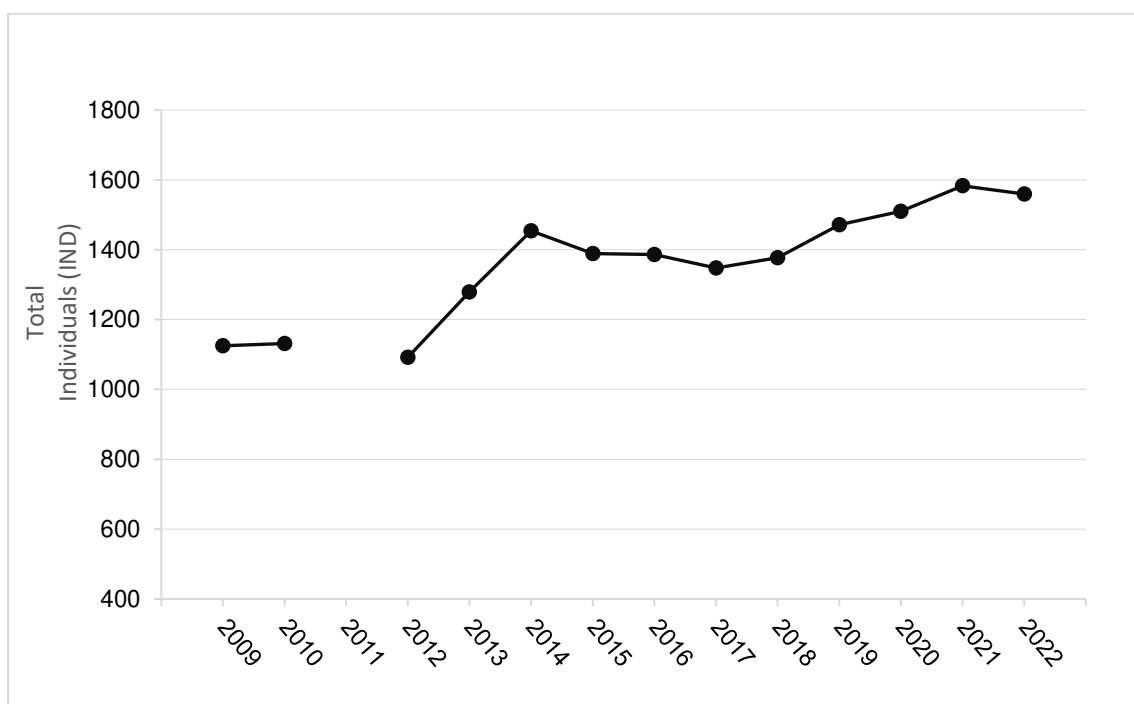


Figure 13: Total number of individual Common Guillemots from 2009-2022 across seven study-plot areas.

Razorbill study-plot counts

Seven study-plots were counted between 0800 and 1600 on five occasions during the period 1 June to 22 June. The mean of the study-plot counts for Razorbill was 1065 IND (Table 10). As with 2021 the first count was the highest, with another two counts into four figures.

Table 10: Razorbill study plot count results - last 5 years

Count	2018 IND total	2019 IND total	2020 IND total	2021 IND total	2022 IND total
1	753	832	868	1055	1305
2	718	842	944	1027	1108
3	766	859	1087	903	989
4	766	1004	998	1047	904
5	650	1077	951	967	1020
Mean	731	923	970	1000	1065

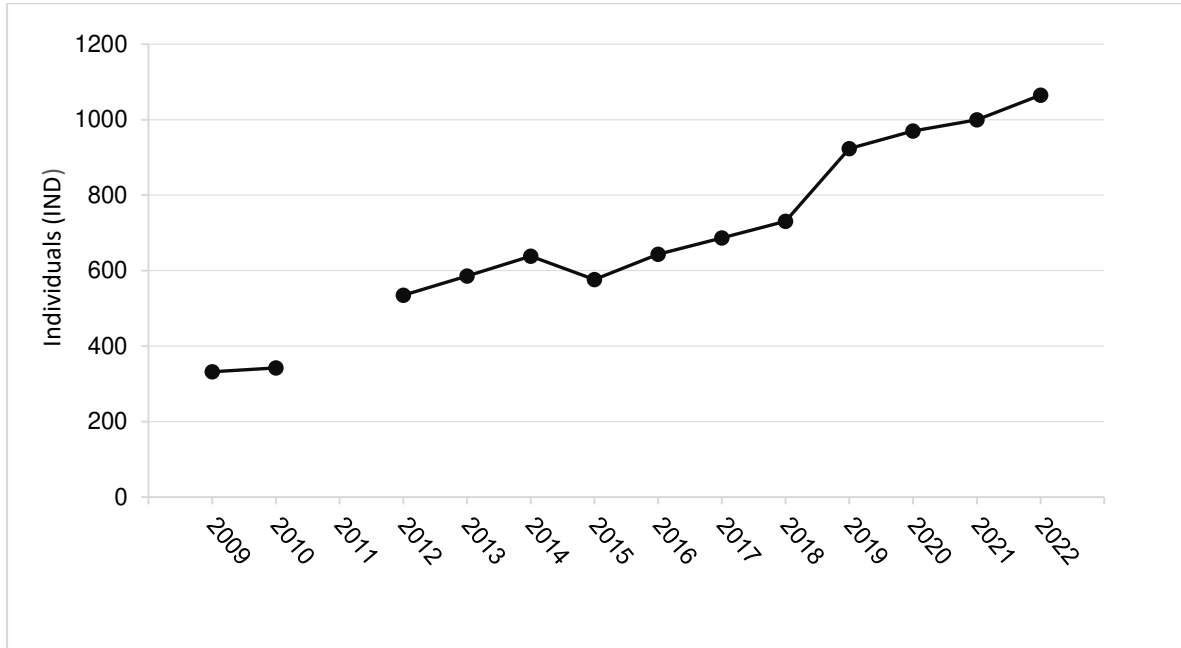


Figure 14: Total number of individual Razorbills from 2009-2022 across seven study-plot areas.

COMMON GUILLEMOT AND RAZORBILL CHICK DIET STUDY

The following extracts have been taken from an unpublished RSPB sabbatical report (Mitchell, S. 2022) on auk diet undertaken at the colony this summer, kindly provided by the author.

Methods

Direct observation was used to investigate and compare auk chick diet during four weeks in the peak chick-rearing period, from 12 June – 9 July 2022, at Bartlett Nab, Bempton Cliffs and Carter Lane at Flamborough Head. At Bempton a total of 46 nest sites were identified – 41 Guillemot and 5 Razorbill. At Flamborough a total of 104 nest sites were identified including 19 Razorbill. Surveys were conducted during the most active feeding periods. These are after dawn at approximately 05:30 to 08:00 and again in the evening at approximately 17:30 to 20:00 to avoid the busiest times of day (to minimise disturbance by visitors). To survey the nests the observer watched the cliff face, without binoculars or a telescope, for birds flying in and landing. When birds landed, the observer, using a telescope or binoculars (dependent on distance from nest site) was then able to confirm a chick feed before identifying the species of fish, its size category and length estimation(mm). The categorisation of prey size into small, medium, and large, was estimated in relation to the size of the auk's bill, alongside size estimation (and number of prey for Razorbill). For Razorbill, categorisation into sizes of prey is complicated by multiple prey items carried crossways in the bill, but the chicks often took the fish from the bill one at a time or the adult placed the fish on the cliff ledge and fed the chick one fish at a time allowing time for the observer to classify prey. Observations were made for a total of 100 hours over 20 days (2 survey periods of 2.5 hours per day).

Results

In total, 661 identifiable prey items (from 434 feeds – 382 Guillemot and 52 Razorbill) were recorded at the two survey sites. The species composition of Guillemot and Razorbill chick diets differed markedly with the Guillemot chick diet containing significantly more sprats than the Razorbill chick diet, and Razorbill chick diet containing significantly more sandeel sp.

Of the 661 prey items, 382 were single item Guillemot feeds. 79.1% were sprats, 15.7% were sandeel sp. and 5.2% were squid (no other prey items were identified) showing a clear chick diet preference for sprats. From 52 Razorbill feeds, 279 prey items were recorded, of which 98.6% were sandeel sp. and 1.4% were sprats showing a clear chick diet preference for sandeels. Most Razorbill feeds were multiple prey item feeds (45 multiple and 7 single prey items). This correlates with the species' preference to fish for more, but smaller prey over fewer but larger prey.

Whilst the methodology and purpose of diet studies carried out in previous years differs, it is still possible to make a comparison between the prey types recorded (see Table 1). Whilst the 2022 study mirrors prey type preference trends of previous years, the data shows a marked increase in sandeel feeds for Guillemots when compared to the 2015 and 2021 data. The percentage of sandeel feeds by Razorbill is also higher when compared to those same years.

Table 1. Comparison of 2022 prey types to previous years' studies.

		Study year			
Auk species	Prey type	2015	2018	2021	2022
Guillemot	Sprat	95.1%	85.8%	95.9%	79.1%
	Sandeel	4.3%	14.2%	Unknown	15.7%
	Other	0.6%	0%	Unknown	5.2%
Razorbill	Sprat	10.3%	2.9%	Unknown	1.4%
	Sandeel	89.7%	96.8%	88.7%	98.6%
	Other	0%	0.3%	Unknown	0%

Data taken from postgraduate research by Jeavons (2015), Baker & Duffield (2018) and O'Leary (2021). In addition, Anderson *et al* (2013) recorded Guillemot feeds at Bempton Cliffs over four years (to 2011) and found that clupeids made up <75% and sandeels >25% of chick diet.

The observer was able to confidently record the prey size category and size estimation of 642 prey items (365 Guillemot and 277 Razorbill). The size category and size estimation of 19 prey items was not recorded (reasons for this included a quick feed or the adult obscured the view whilst feeding, for example). A summary of size estimations is provided in Table 2.

Table 2. Summary of size estimations for prey items of both auk species.

Guillemot	Prey type (number)			Razorbill	Prey type (number)	
Prey size estimation (mm)	Sprat	Sandeel	Squid	Prey size estimation (mm)	Sprat	Sandeel
55	0	3	3	<50 (40-49)		24
60	5	2	5	50-70		195
65	16	7	5	71-90	3	42
70	31	2	3	91-100		6
75	30	0	0	101-120	1	2
80	85	4	2	120+		3
85	43	4	0	200		1
90	66	15	1			
95	5	1	0			
100	8	6	0			
100+	3	-	0			
110 (sandeel only)	-	4	-			
120 (sandeel only)	-	5	-			
120+ (sandeel only)	-	1	-			
TOTALS	292	54	19		4	273
	365*				277*	

*The totals here plus the 19 missing prey items without size category and estimation data totals 661 prey items.

The data shows that sprats measuring 80mm, 85mm and 90mm were those fed most frequently to Guillemot chicks. With only one prey item per feed and to ensure an energy efficient foraging trip, it is important that the adult Guillemot brings a sprat which has substantial nutritional value, but one which the chick can swallow. The data also shows that sandeels taken by Guillemot are larger overall (26% at 90mm) than those taken by Razorbill to account for the single prey loading technique employed by the species.

Although the survey sites are located 3.2 miles apart the entire seabird colony stretches over 15 miles of coastline from Filey Brigg to South Landing, Flamborough Head. The diet preferences of auks tend to be similar within colonies; and this is illustrated in the data which shows that Razorbill preferred to feed sandeels at both sites and Guillemot preferred to feed sprats at both sites. Studies have shown Guillemot to have an active feeding period after dawn, presumably driven by the need to feed chicks after a break in feeding overnight. It can be assumed this would also be the case for Razorbill. The data shows that time of day/evening is not correlated with a change in prey type. Thus, the study data shows that differences identified in feeds can be attributed to auk species rather than survey site or time.

At Bartlett Nab, young Gannets prospecting potential nest sites were observed as causing the nest failure for six nest sites in two visits. In one incident, a Gannet landed on a ledge with a row of four Guillemot nests (two chicks and two eggs). In total five Gannet pairs were prospecting new nest sites on ledges currently used by Guillemot at Bartlett Nab.

Conclusions

The differences identified in feeds can be attributed to auk species rather than survey site or time. Studying chick diet is an effective short-term indicator of prey abundance. The data collected in this study will contribute to long-term chick diet data, that if continued could be used to monitor how the impacts of climate change and the commercial fishing industry are impacting Guillemot and Razorbill chick diet.

BLACK-LEGGED KITTIWAKE RETRAPPING ADULTS FOR SURVIVAL PROJECT

In 2018, a colour ringing project was set up for Black-legged Kittiwake at North Landing, Flamborough with the aim of establishing adult survival rates. In 2020 it was formally registered as a Retrapping Adults for Survival (RAS) with the BTO with the data from the previous two years contributing to the project. The results from this study will provide a key monitoring tool when assessing the health of this red-listed species, and compliment detailed productivity and population monitoring already carried out on Black-legged Kittiwake within the Flamborough and Filey Coast SPA.

The 2022 field season marked the fifth consecutive year of the RAS colour ringing project. Weekly resighting effort commenced in early April and concluded mid-August; during that period a total of 97 individuals were recorded from a potential 130 colour ringed birds. These consisted of 38 of the 51 adults from 2018, 41 of the 60 adults from 2019 and 18 of the 19 adults from 2020.

This summer we were joined by three work experience students who were based at Bempton Cliffs in July. This offered a valuable opportunity to engage young aspiring conservationists, involving them in data collection and demonstrating the importance of this research and providing hands on fieldwork experience.

To date sightings of birds from this project away from the colony include two individuals, one in Aberdeen Harbour on 22 September 2019 and another in Gormanston, Co. Meath, Ireland on 1 September 2020.



Image: Izzy Fry reading colour-ringed adult Kittiwake at North Landing, Flamborough.

EUROPEAN SHAG COLOUR RING RE-SIGHTINGS

Just a single colour ringed Shag was noted at the colony this summer (Green LRR) having been seen previously in 2018 and 2021. Given the time spent watching the colony both from land and as part of the whole colony count it is surprising how few ringed birds were observed. This is possibly a reflection of the very low breeding numbers this season. To date, 34 individuals have been recorded here (Table 11).

Table 11: European Shag colour ring re-sightings at Flamborough & Filey Coast SPA 2014 – 2022.

Code	BTO ring number	Year Ringed	Age	Colony	Year recorded at Flamborough & Filey Coast SPA
EUH		2014	Pullus	Fidra	2014, 2017
CLR		2014	Pullus	Farne Islands	2014, 2015
END	1478565	2014	Pullus	Inchmickery	2014, 2015, 2016, 2017
CHC	G8898	2006	Pullus	Isle of May	2014, 2015, 2016, 2017
CNE		2014	Pullus	Farne Islands	2014
ACE	1472974	2014	Adult	Craigleith	2015, 2016
ESB	1478625	2014	Pullus	Inchmickery	2015
ARI		2014	Pullus	Craigleith	2015
NEJ		2015	Pullus	Farne Islands	2015
DAN	1485389	2016	Pullus	Isle of May	2017, 2018, 2020, 2021
UWE		2016	Pullus	Farne Islands	2017
FTA		2016	Pullus	Isle of May	2017
IAX		2016	Pullus	Isle of May	2017
HUD		2016	Pullus	Isle of May	2017
LRR		2016	Pullus	Farne Islands	2018, 2021, 2022
TPC	1396622	2009	Adult	Craigleith	2014, 2015, 2016, 2017
RZF		2013	Adult	Farne Islands	2015
PCA		2010	Pullus	Farne Islands	2015, 2016
AUL	1483281	2015	Adult	Isle of May	2016, 2017
BLJ		2017	Adult	Isle of May	2018, 2019
AFP		2014	Pullus	Isle of May	2014, 2019
AUH	1483074	2014	Pullus	Isle of May	2016, 2017, 2018
ADA	1473962	2014	Pullus	Isle of May	2016, 2018†
IPJ		2016	Pullus	Isle of May	2016, 2018
DAP	1472058	2015	Pullus	Isle of May	2017
IDT		2016	Pullus	Isle of May	2017
CUX	1472024	2015	Pullus	Isle of May	2017
HZA		2015	Pullus	Isle of May	2017
EZS		2018	Pullus	Farne Islands	2018
NDC		2014	Pullus	Isle of May	2014
FTX		2012	Pullus	Isle of May	2014
CTF		2018	Pullus	Isle of May	2018
UDA	1495246	2020	Pullus	Isle of May	2021
AFN	1453306	2011	Pullus	Isle of May	2017

RECREATIONAL DISTURBANCE



Yorkshire Marine Nature Partnership

F&FC SPA Report 2022 - Recreational Disturbance

Data on recreational activities and wildlife disturbance events has been recorded around the Flamborough and Filey Coast SPA consistently since 2013. The majority of data is collected 'ad-hoc' by volunteers and staff from RSPB Bempton Cliffs and other local organisations. Students from regional universities are also invited to conduct 'intensive surveys' throughout the main seabird breeding season. This information is used to support management of the site and to educate user groups on the sensitivities of the breeding seabird colony, via the Yorkshire Marine Nature Partnership (YMNP).

Over the years this research has helped to identify a number of activities that have the potential to disturb the natural behaviour of the breeding seabird colony. This has led to the development of user-group specific codes of conduct and voluntary agreements, designed to allow activities to continue whilst reducing any negative impacts on the seabirds. These agreements have been bolstered by the recent creation of Operation Seabird, and the active engagement of local Police, RSPCA and the Marine Management Organisation in recreational disturbance issues.

During the Covid-19 pandemic (2020 – 2021) recreational disturbance reporting decreased due to the national restrictions on movement. Equally, students from local universities were not able to conduct 'intensive monitoring'. The 2022 season has seen a subsequent increase in disturbance reporting, however reporting is still significantly lower than pre-Covid levels and no students were recruited to gather additional data.

Overall, 29 seabird disturbance reports were received in 2022, of which 19 were considered to cause high to moderate disturbance. For comparison, in 2019, 243 disturbance records were collected across both the ad-hoc and intensive survey methodologies. This year, the most obvious reduction was in the number of personal watercraft (jet skis) reported, with just one recorded (which caused no disturbance), versus a total of 45 records in 2019 (with 28 of those creating a high to moderate disturbance response in the seabirds). Similar reductions could also be seen in motorised boats, canoes and kayaks, this year.

The longer-term effects of the Covid pandemic on the economy and evolving visitor preferences may provide some explanation for these changes. A general reduction in disturbance reporting could also be reflected in the 2022 data, despite information about the recording system being shared frequently with partners and the launch of a new online reporting facility. Equally, the reduction in activities often seen as causing significant levels of disturbance could be a result of the high-profile Operation Seabird activities, and an increased awareness of the need to give wildlife space. Continued monitoring over the next few years will be crucial to understand these fluctuations further.

IMPACT OF HPAI AT BEMPTON CLIFFS AND THE WIDER SPA

HPAI (Highly Pathogenic Avian Influenza) was officially confirmed by DEFRA in late August in two Kittiwake collected from Speeton (northern end of colony, off reserve) in mid-August, but we saw clear evidence of HPAI impacts on Gannet from July onwards, and mortality in both adults and chicks has been significant, though impact on nesting birds seen mostly in two core areas and not on the scale seen on Shetland or the Bass Rock colonies. Though not confirmed by testing, the Gannet mortality was clearly HPAI. Confirmation in Kittiwake and earlier suspected cases in Guillemot and Razorbill were not unexpected given experience at other seabird colonies, and one positive is that from all evidence mortality remained low for the other seabird species apart from Gannet.

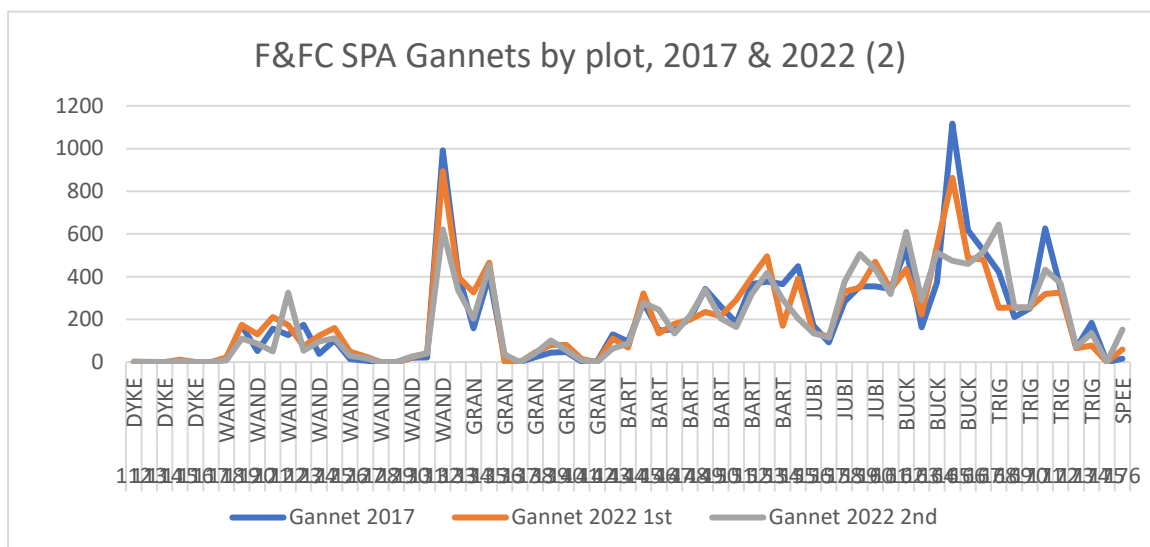
The annual productivity monitoring has provided valuable data on the effect of HPAI in the colony, aided by monitoring work undertaken by the RSPB Conservation Science team associated with seabird tagging work and other records of sick or dead birds.

Spring 2023 will be a worrying time, and additional monitoring is being planned.

Evidence of HPAI impact on Gannet and other seabirds 2022

Mortality and infection was difficult to see and gauge but the key evidence has been:

- As part of the full SPA colony count, a second boat-based Gannet count was made on 3 July, primarily because of concern that the full colony count made earlier in June had shown no growth in colony size, unexpected given the previous long-term growth. This may have shown early indications of HPAI impact on the two densest areas of the Gannet colony (see graph below). Though involving relatively small numbers of birds overall, the localised decline would not be expected at this stage of the season.



- The RSPB Conservation Science team found the first evidence of adult Gannet mortality at the end of June, with 15 dead birds below Speeton Cliffs. Subsequently they made counts of 61 and a week later 80 dead Gannet in mid-August (both chicks and adults) along a ca. 2 km stretch below Speeton Cliffs (where rock falls prevent the tide washing birds away), with one main cluster where half of these were found.

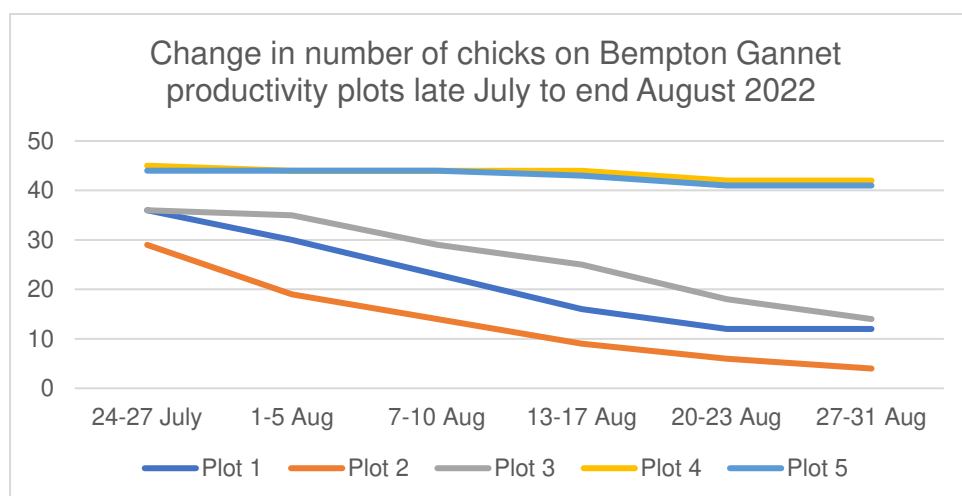
- Chick mortality (over 80 chicks) at Staple Newk, recorded via detailed productivity monitoring. The gradual spread in mortality was as would be expected from an infectious disease and far exceeded chick mortality rates previously recorded.
- Adult mortality. Peak count of 12 dead adult Gannet on the sea from reserve viewpoints along the ca. 2 km stretch – this is very variable with tides and wind. At least 8 dead adults were visible on Staple Newk.
- ‘Black-eyed’ Gannet (a recognised symptom) have been photographed in the immature ‘clubs’ and in adult birds on and near the top of the cliff – a maximum of 8 adult/sub-adults with one or both eyes affected. Otherwise these birds appear healthy, and some have been photographed in flight.
- For much of the colony, with Gannets nesting on narrow ledges it is unlikely we would see evidence of mortality, but the two productivity plots away from Staple found slightly reduced productivity, and informal counts of chicks from Grandstand (77 chicks) did not indicate high mortality.
- A beach count along the south section of Filey Bay on 4 September found 45 dead adult and 63 dead juvenile Gannet and 26 adult and 12 juvenile Kittiwake.

Taken together we have a range of evidence of impacts, but for all species apart from Gannet there was no significant mortality recorded. For auks, worrying signs did not materialise into the scale of mortality observed further up the East Coast. Though Kittiwake were the only species for which HPAI was confirmed, the scale of impact has again been low from evidence of productivity monitoring, though late season mortality in adults and fledglings was seen and is a worry.

That the SPA covers 20 km of nesting cliffs with varying densities of birds may well have helped, with the scale of the protected area and the linear narrow ledges giving an element of resilience.

Evidence from on-reserve Gannet monitoring via productivity plots

There are 5 productivity plots for Gannet on the reserve, three at Staple Newk (Plots 1-3), a dense area of the colony, and a further two where nests are more dispersed (Plots 4 & 5)



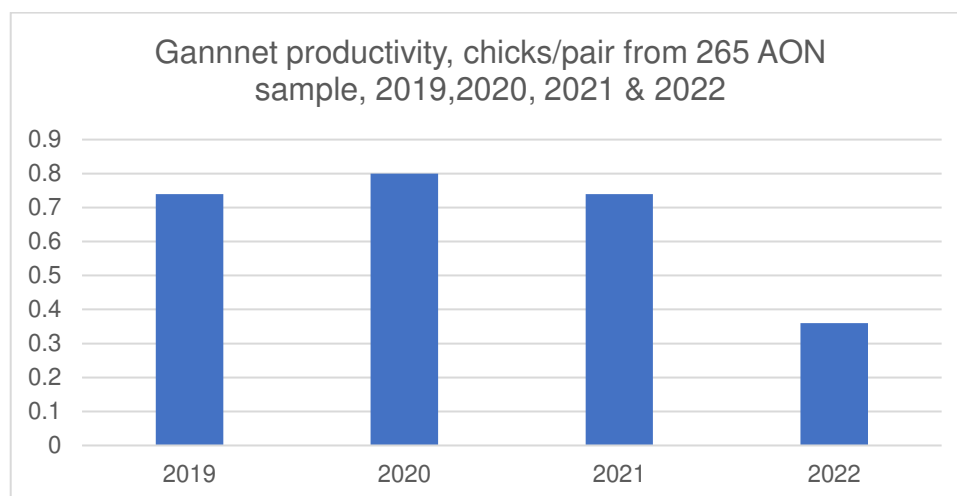
Gannet productivity plots – change in number of chicks late July to early September

	24-27 July	1-5 Aug	7-10 Aug	13-17 Aug	20-23 Aug	27 – 31 Aug	<i>Chicks lost, late July to end August</i>
Plot 1 (Staple)	36	30	23	16	12	12	24
Plot 2	29	19	14	9	6	4	25
Plot 3	36	35	29 (3)	25	18	14	22
Plot 4 (Nettletrip)	45	44	44	44	41	41	4
Plot 5 (Jubilee)	44	44	44	43	41	40	4
Chicks lost since last survey/total		18	18	17	26	6	79

Between late July and mid-August there was a steady loss of Gannet chicks in the three Staple Newk plots, and the counts suggest greater than normal chick losses were underway in early July, especially on Plot 2 (it is difficult to assess accurate chick numbers earlier in July as some nests are still to hatch and young chicks are often hidden and not confirmed). The rate of chick loss reduced at Staple Newk later in August. The first healthily fledging Gannet was seen on the 23 August.

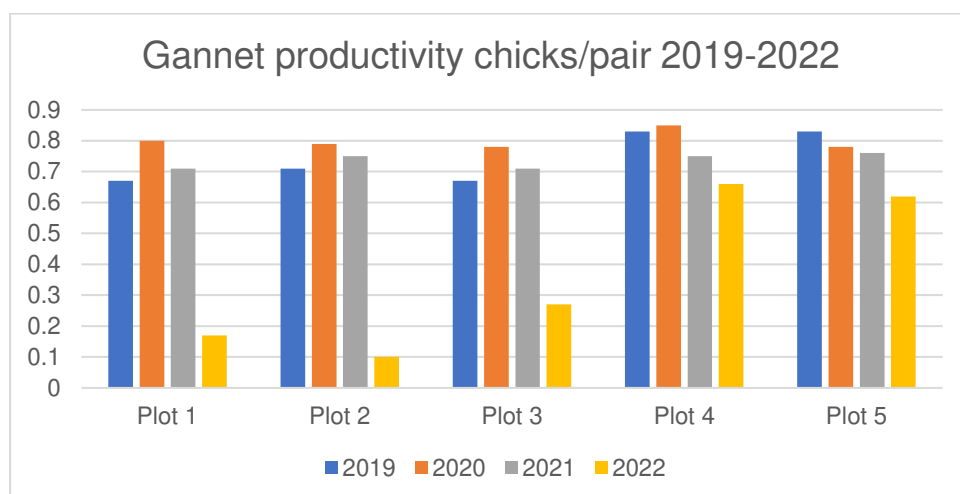
The other two plots at Nettletrip and Jubilee remained unchanged through August, possibly linked to the lower density of nesting birds and location of nests on narrow ledges reducing the likelihood of transmission, but a number of chicks were lost prior to reaching the 75+ day needed to conclude that they successfully fledged, and it is suspected that HPAI was the likely reason. The impression is that more chicks were being left unattended than in a normal year (something to record next year).

Gannet productivity 2022 compared to 2019-2021



Only 0.36 chicks were fledged per pair in 2022 compared to an average of 0.76 over the three years 2019-2021.

Range in productivity across the five monitoring plots in 2019 - 2022



The impact of HPAI on Gannet chick mortality across much of the colony is likely to have resembled Plots 4 and 5 given distribution and relative densities of nests. Additional monitoring plots in lower density areas would give a more accurate picture (see planning for 2023 below).

We do not know what proportion of adults associated with failed nests have died. The increase in adults at Staple Newk at the end of August may mostly have been new birds establishing territory on vacant nests, as has been reported from Bass Rock, where individuals were identified by colour-ringing.

Monitoring plan in 2023





There is a need to set up additional monitoring to:

1. Evaluate any signs of impact of 2022 HPAI on the SPA populations next spring (primarily Gannet)
2. Monitor any developing impact next year for Gannet and other species

This will include at least:

- Earlier assessment of Gannet establishment and additional productivity plots and recording in productivity monitoring
- Repeat of boat-based count of Gannet AOS
- Formalised checks/counts of evidence of dead birds
- Consider options in conjunction with NE and wider partners of trial of drone monitoring/fixed point cameras for population counts and attendance

Photographs of change at Staple Newk

Staple Newk on 27 July	Staple Newk on 22 August
	
	

Plot 2 on the top of Staple Newk (above) 27 July and 29 August. The most significant impact has been observed here, with 4 chicks remaining from 50 nests. Adult numbers increased late August.

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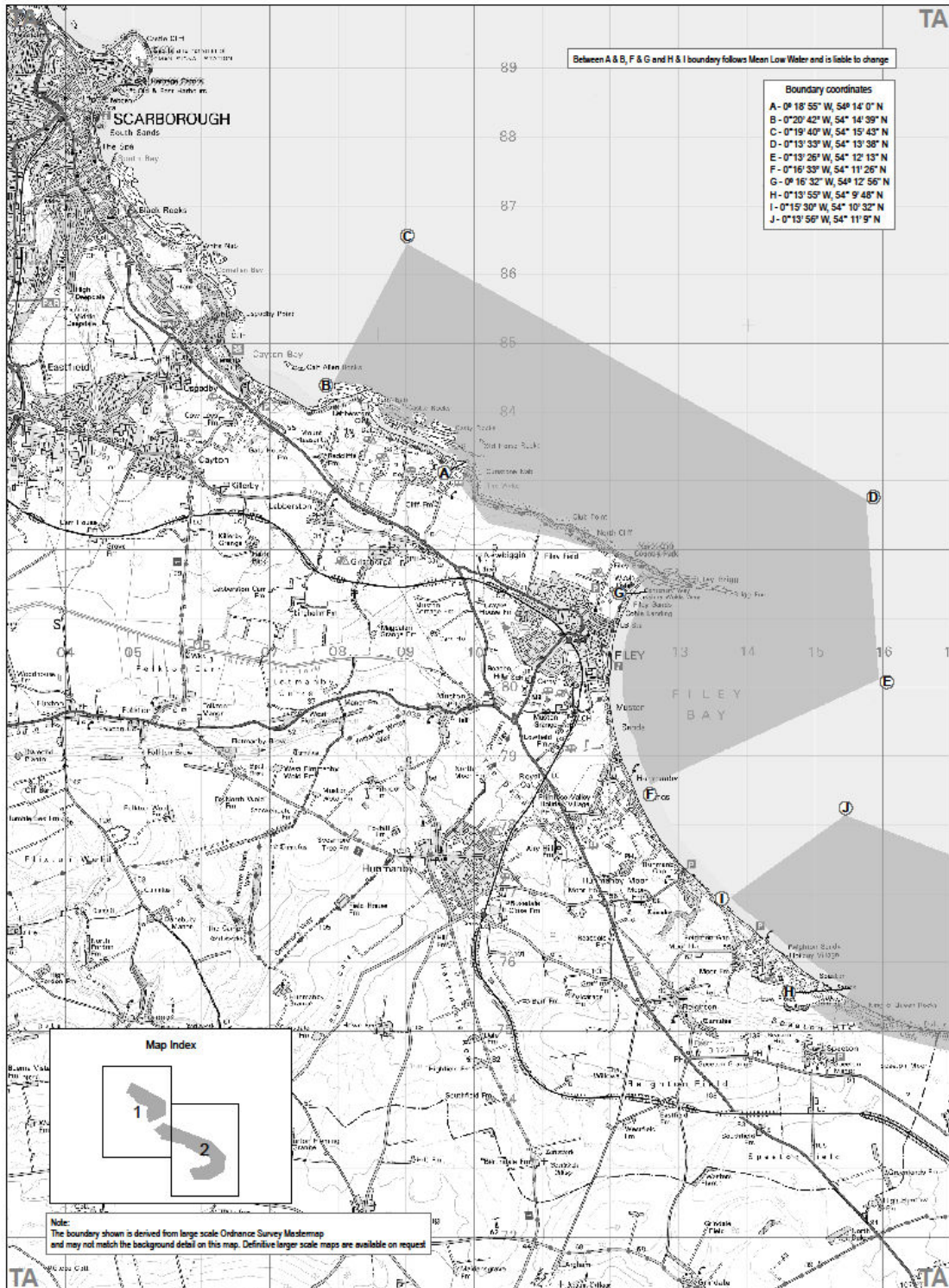
Blue Dolphin Holiday Park at Filey for allowing access to reach important sections of the colony for monitoring works.

And lastly, the owners and management at Thornwick Bay Holiday Village at Flamborough for providing invaluable parking permits for North Landing car park.

Without all of whom the Flamborough and Filey Coast SPA seabird monitoring programme would not be the success that it is.

APPENDIX 1: Flamborough and Filey Coast SPA boundary maps

North



Potential Special Protection Area
Flamborough and Filey Coast
 East Riding of Yorkshire, North Yorkshire

Special Protection Area
 8039.50 Hectares

This map relates to a site entered in the Register of European Sites for England
 Register reference number: UK9006101
 Date of registration:
 Signed:

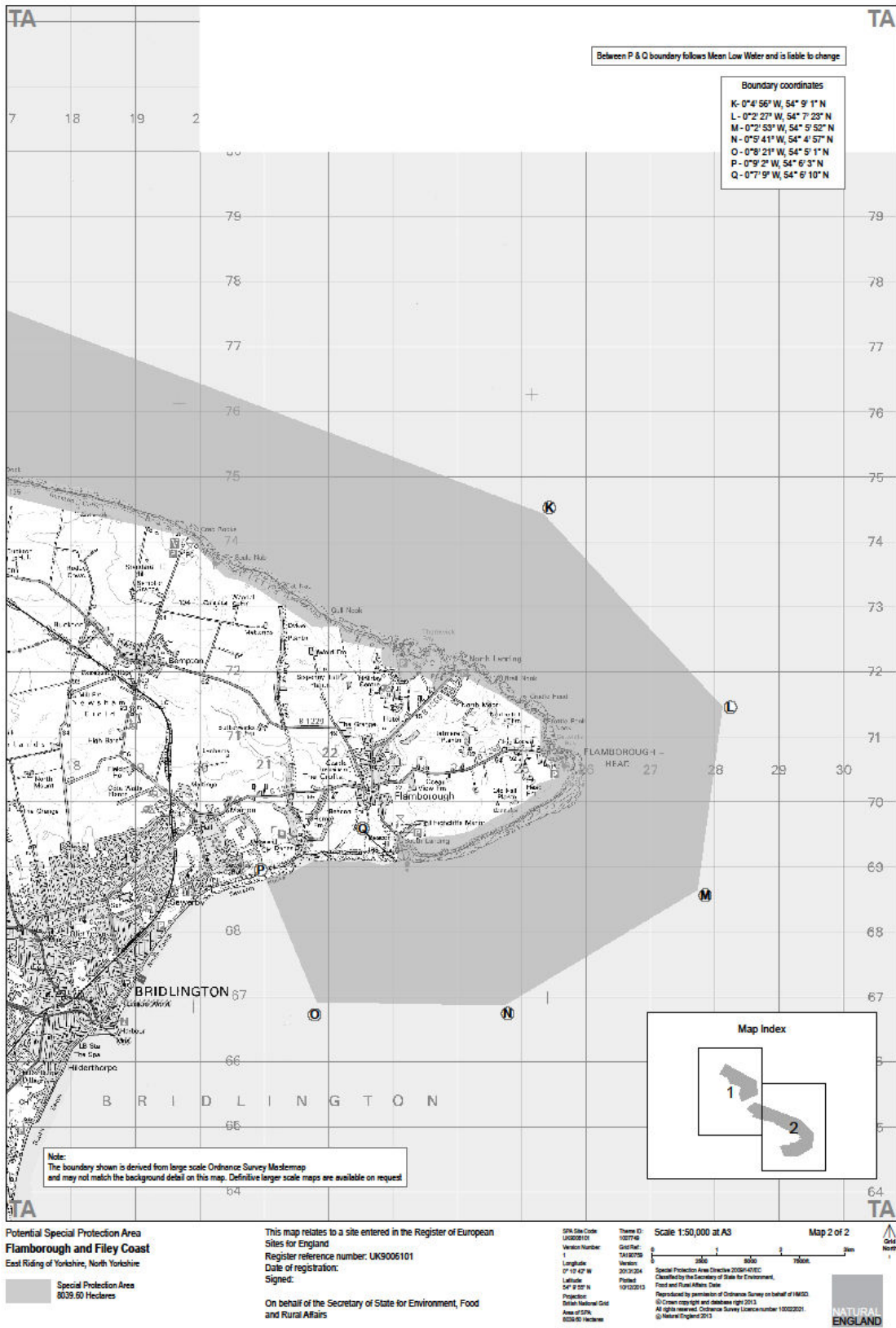
On behalf of the Secretary of State for Environment, Food and Rural Affairs

OSN Data Code: UK000018
 Version Number: 1
 Longitude: 0° 12' 47\"/>

Scale 1:50,000 at A3
 Map 1 of 2
 Special Protection Area Directive 2009/147/EC
 Classified by the Secretary of State for Environment, Food and Rural Affairs Date:
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South



APPENDIX 2: Productivity monitoring plot locations

Northern Fulmar productivity plots – Flamborough Head and Bempton Cliffs



Northern Fulmar productivity plots – Filey



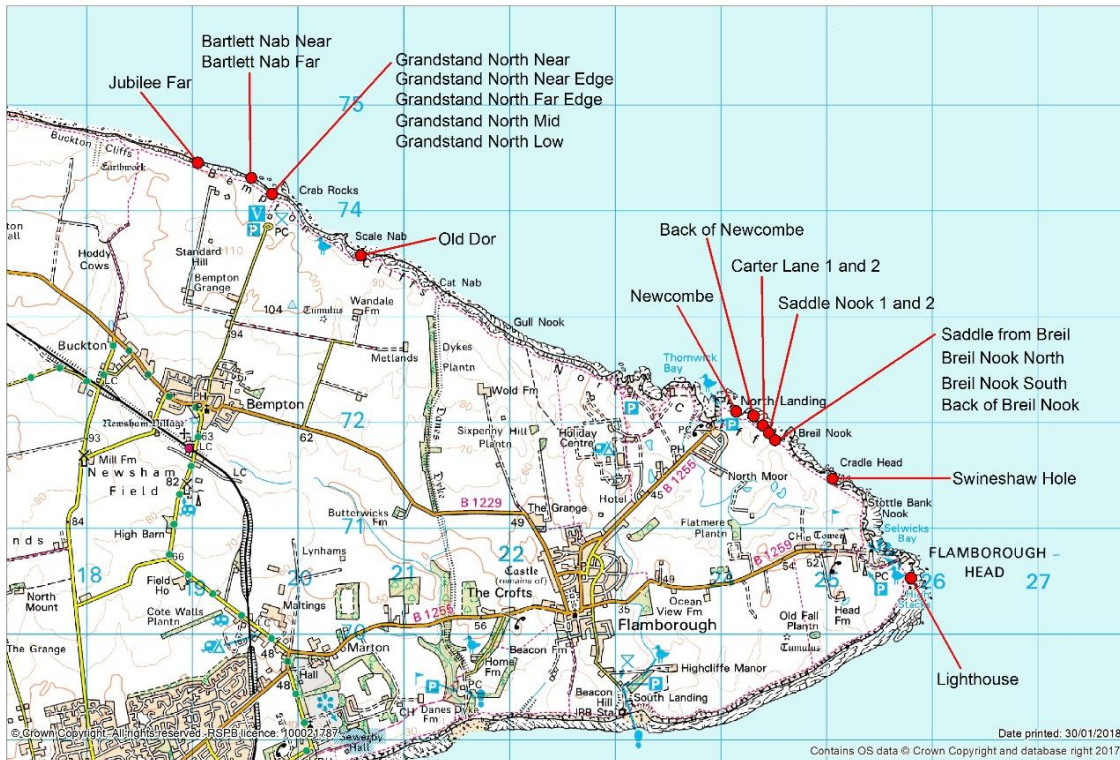
Northern Gannet productivity plots



European Herring Gull productivity plots



Black-legged Kittiwake productivity plots – Flamborough Head and Bempton Cliffs



Black-legged Kittiwake productivity plots – Filey



Common Guillemot productivity plots



Razorbill productivity plots



APPENDIX 3: Study-plot monitoring locations

Black-legged Kittiwake study-plot locations



Common Guillemot study-plot locations



Razorbill study-plot locations

