Flamborough and Filey Coast SPA Seabird Monitoring Programme

2020 Report

Lloyd, I., Aitken, D., O'Hara, D.

RSPB Bempton Cliffs, 9-11 Cliff Lane, Bempton, East Riding of Yorkshire, YO15 1JD

Front cover image: Juvenile Black-legged Kittiwake. © David Aitken

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Summary

2020 has been an unprecedented year for everyone, and the Flamborough and Filey Coast SPA Seabird Monitoring Programme did not escape the effects of the Coronavirus pandemic. With a two-month lockdown in place throughout England during peak egg laying and incubation for many species, it was hard to imagine how the monitoring programme could be salvaged. Fortunately, restrictions eased in late May and a much reduced programme of monitoring was commenced with a small monitoring team, following strict safety guidelines.

The limited 2020 Seabird Monitoring Programme was successfully completed by a full-time Seabird Research volunteer and a small number of Bempton Cliffs reserve staff and volunteers. Monitoring began in late May just as auks were starting to hatch, with one Guillemot chick and one Razorbill chick present on the first visits on 29 May. Auk productivity monitoring followed an identical methodology to previous years once started, with visits every third day to check for the presence and absence of eggs and chicks.

Seven Kittiwake and five Herring Gull plots were monitored between Bempton Cliffs and Flamborough Head. While monitoring began around a week later than usual, the methodology remained identical to previous years with visits once a week to check for clutches and broods through to the end of August once all surviving chicks had fledged.

All five Gannet plots were monitored on the reserve, however due to reduced capacity the methodology was amended to 'method 2' as described in the seabird monitoring handbook which involves just two visits, one during late incubation/early hatching period in early-mid June and one prior to first chicks fledging, around the 10 to 15 August.

Fulmar productivity was monitored across three plots at Flamborough Head only. This followed the same methodology as in previous years, with three visits in early June and a follow-up visit in mid-August to assess the number of fledgeable chicks on each plot. Unfortunately, it was not possible to monitor plots at Bempton or Filey due to limited resources.

The productivity results were as follows (summarised in Table 1):

- Northern Fulmar – 27 pairs monitored across 3 plots from which 13 chicks fledged producing a mean plot productivity of 0.52 (SE ± 0.1244) chicks per apparently occupied site (AOS) and an aggregated productivity of 0.48 chicks per AOS across all plots.

- Northern Gannet – 266 nests monitored across 5 plots from which 213 chicks fledged producing a mean plot productivity of 0.80 (SE ± 0.0131) chicks per apparently occupied nest (AON) and an aggregated productivity of 0.80 chicks per AON across all plots.

- Black-legged Kittiwake – 363 nests monitored across 7 plots from which 222 chicks fledged producing a mean plot productivity of 0.61 (SE ± 0.0322) chicks per AON and an aggregated productivity of 0.61 chicks per AON across all plots.

- European Herring Gull – 69 nests monitored across 5 plots from which 35 chicks fledged producing a mean plot productivity of 0.61 (SE ± 0.1685) chicks per AON and an aggregated productivity of 0.51 chicks per AON across all plots.

- Common Guillemot – 245 pairs monitored across 4 plots from which 134 chicks fledged producing a mean plot productivity of 0.55 (SE ± 0.0867) chicks per AOS and an aggregated productivity of 0.55 chicks per AOS across all plots.

- Razorbill – 224 pairs monitored across 4 plots from which 130 chicks fledged producing a mean plot productivity of 0.58 (SE ± 0.0230) chicks per AOS and an aggregated productivity of 0.58 chicks per AOS across all plots.

Table 1: Summary of productivity results across the Flamborough and Filey Coast SPA in 2020.
**N.B.: Mean productivity is the average of all the plot productivities, aggregate is the total number of fledged chicks divided by the total number of sites/nests monitored.*
**N.B.: No productivity monitoring at Filey due to a reduced monitoring capability.*

				Productivity		
	No. plots	**AOS or AON**	**Fledged chicks**	**Mean**	**Aggregate**	**± SE**
Northern Fulmar (AOS)	3	27	13	0.50	0.48	0.1244
Northern Gannet (AON)	5	266	231	0.80	0.80	0.0131
Black-legged Kittiwake (AON)	7	363	222	0.61	0.61	0.0322
European Herring Gull (AON)	5	69	35	0.61	0.51	0.1685
Common Guillemot (AOS)	4	245	134	0.55	0.55	0.0867
Razorbill (AOS)	4	224	130	0.58	0.58	0.0230

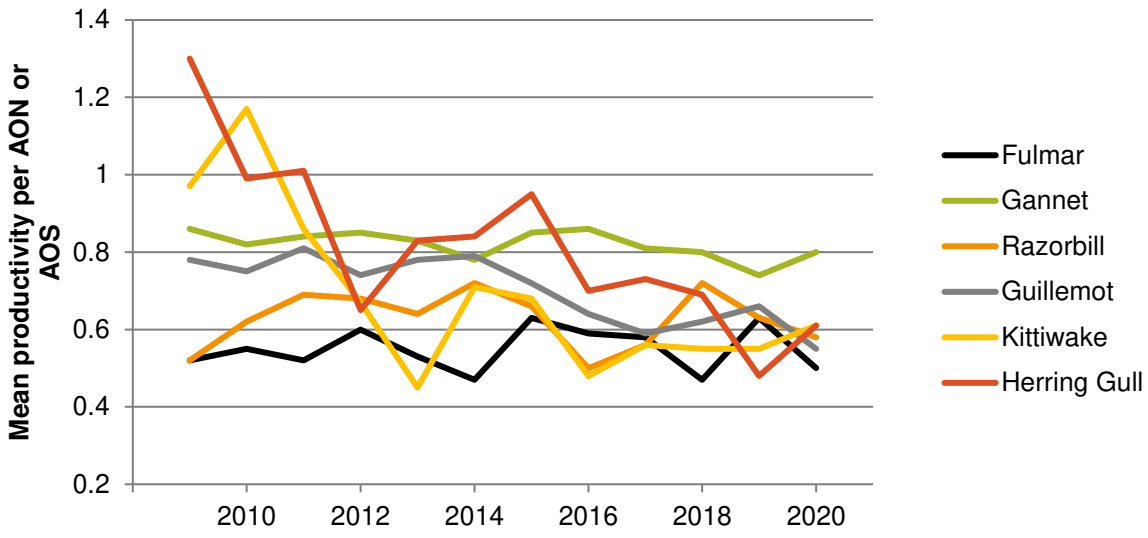

Figure 1: Summary of the productivity trends of the six seabird species monitored from 2009-2020.
**N.B.: Black-legged Kittiwake and Northern Fulmar results include Filey in with the original Flamborough and Bempton Cliffs results from 2012 and 2017 respectively.*
**N.B.: Productivity monitoring followed a reduced programme in 2020 with a late start, a reduced number of plots monitored and an amended methodology for some species.*

Study-plot counts were successfully completed between 1 and 22 of June, providing an important insight into population changes at this colony. Kittiwake numbers were consistent with previous years with a mean AON of 1835 (Figure 2), with the second count unusually higher than the first, suggesting nests remained occupied despite failures. Guillemot and Razorbill numbers were the highest they have been since the counts began in 2009 with 1510 and 970 individuals respectively.

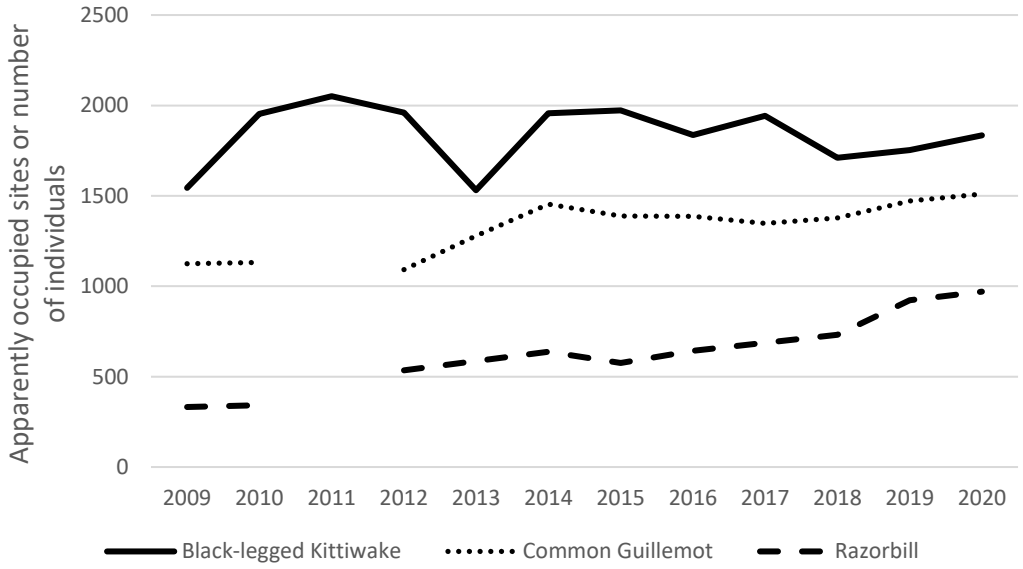

Figure 2: Historic study-plot count results for Black-legged Kittiwake, Common Guillemot and Razorbill from 2009-2020.
**N.B.: Black-legged Kittiwake counted as AON, Guillemot and Razorbill counted as individuals.*

Several aspects of the 2020 monitoring programme could not be completed due to the pandemic. Auk diet was unable to be studied due to lockdown measures and the cancellation of some fieldwork, and the lockdown throughout late March and all of April meant that the annual Puffin survey could not be undertaken.

The Black-legged Kittiwake Retrapping Adults for Survival (RAS) colour ringing project at North Landing, Flamborough was successfully completed for a third consecutive year, with 92 birds re-sighted from 111 birds colour-ringed in 2018 and 2019. An additional 19 breeding adults were added to the project this year, fitted with an individual coded darvic ring, a metal BTO ring and a single green colour ring to indicate the year of capture (green=2020, red=2019, blue= 2018). The lockdown throughout April and May meant that all re-sighting effort took place during the incubation and chick rearing period, later than in previous years when most effort was during the nest building period, resulting in a higher percentage of individuals being re-sighted this season.

Disturbance at the colony continues to be an issue, and whilst seabirds benefitted from reduced human activity at the colony throughout lockdown, jet-skis and kayaks created significant disturbance once restrictions eased in late May and people retuned to the coast en masse.

Introduction

Background

Seabird population data has been collected within the 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 again in 2000 for the 'Seabird 2000' census, 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 again in 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 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 at 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, a Special Area of Conservation, a Special Protection Area, a Site of Special Scientific Interest and a Heritage Coast site which includes three Local Nature Reserves, 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 SSSI's. 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 may have a detrimental impact on the features of the designated sites. 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 Joint Nature Conservation Committee (JNCC), the RSPB's Annual Reserve Monitoring (ARM) 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. 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, the 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 reduced 2020 Flamborough and Filey Coast SPA Seabird Monitoring Programme are detailed in this report. Access to the monitoring data collected during the seabird monitoring programme is available to researchers and conservation organisations by agreement with RSPB.

Productivity monitoring

Despite the challenges arising from Covid-19, a limited programme of monitoring was completed for six of the eight breeding seabird species found at this colony: Northern Fulmar, Northern Gannet, Black-legged Kittiwake, European Herring Gull, Common Guillemot and Razorbill. Unfortunately, it is not possible to monitor Atlantic Puffin productivity at this cliff-nesting colony, and European Shag productivity was not monitored in 2020.

The reduced Flamborough and Filey Coast SPA seabird monitoring programme in 2020 followed 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. The data collection methodologies were altered for certain species due to the late start and the limited monitoring capacity and time; these are detailed in each species account. 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 total sample in excess 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 at Filey 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. 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*

Three productivity plots were monitored in 2020 between North Landing and the Lighthouse on the Flamborough headland and followed identical methodologies to previous years. Plots were photographed in early May and AOS were 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 were assumed to have fledged.

Mean productivity for Fulmar was 0.50 (SE ± 0.1244) chicks per AOS. A total of 27 AOS were monitored across the 3 plots, from which 13 chicks successfully fledged (Table 2, Figure 3). The mean productivity for Fulmar recorded between 1986-2005 from between 13 and 41 colonies annually was 0.41 (SE ± 0.01) chicks per AOS (Mavor *et al.,* 2008).

Table 2: Northern Fulmar productivity 2020.

Plot	AOS	Chicks fledged	Productivity ch/pr
Newcombe	5	2	0.40
Breil Nook	8	6	0.75
Swineshaw Hole	14	5	0.36
Total	**27**	**13**	
		Mean of plot productivities ± SE	**0.50 ± 0.1244**
		Aggregate productivity	**0.48**

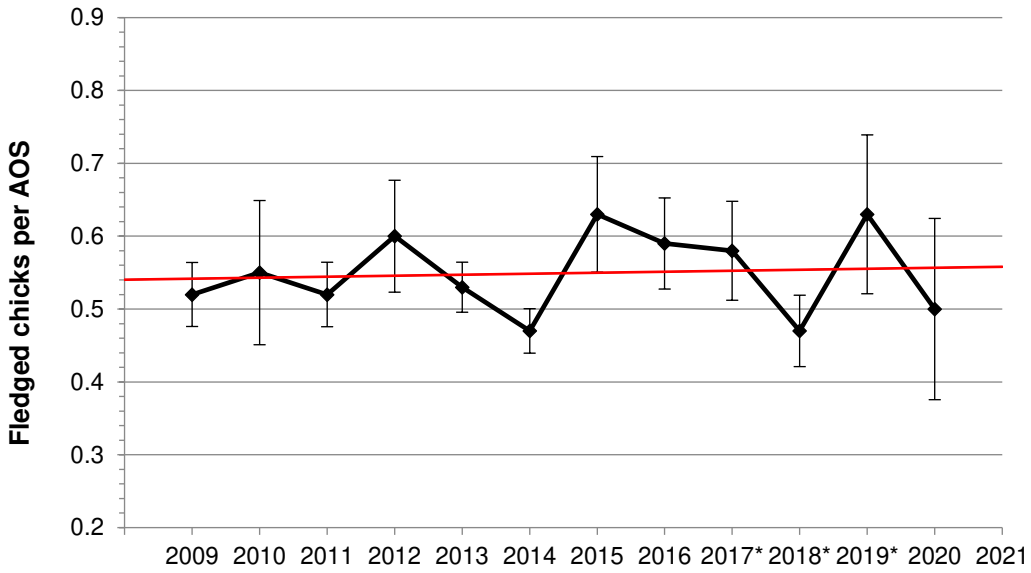

Figure 3: Northern Fulmar productivity 2009-2020, mean of plot results plus/minus SE.
**N.B.: The mean productivity from 2017 onwards includes plots at Flamborough, Bempton and Filey, compared to just Flamborough and Bempton from 2009-2016.*
**N.B.: The number of Fulmar sites monitored in 2020 was much reduced compared to previous years (27 sites monitored in 2020 compared to an average of 64 sites across the last eleven years).*

Fulmar productivity monitoring suffered as a result of Covid-19 due to limited resources; three plots were monitored in 2020 at Flamborough Head only. The productivity from this small sample, whilst on the low side, remains relatively consistent for this species at this colony. Fulmar chicks usually fledge once they reach the age at which they are left unattended on the ledge, however one chick on a plot monitored failed later on suggesting predation or abandonment.

Northern Gannet *Morus bassanus*

Due to lockdown measures in place throughout April and May, and reduced resources available for monitoring, a simplified methodology (method 2, Handbook) was used to monitor the same five Gannet plots. Plots were photographed in late-May, and 50 to 60 AON marked on laminated photographs. A first visit was carried out in early to mid-June and all nests were checked for eggs or chicks. Nests with apparently incubating adults or brooding chicks were considered to be breeding attempts. The same plots were visited again between 10 and 15

August before the first chicks fledged, and the number of fledgeable chicks were recorded. A repeat visit was made to check on any very small chicks 3-4 weeks later.

Table 3: Northern Gannet productivity 2020.

Plot	AON	Chicks fledged	Productivity ch/pr
Jubilee Corner	55	43	0.78
Nettletrip	54	46	0.85
Staple Newk 1	51	40	0.78
Staple Newk 2	52	41	0.79
Staple Newk 3	54	43	0.80
Total	**266**	**213**	
		Mean of plot productivities ± SE	**0.8 ± 0.0131**
		Aggregate productivity	**0.80**

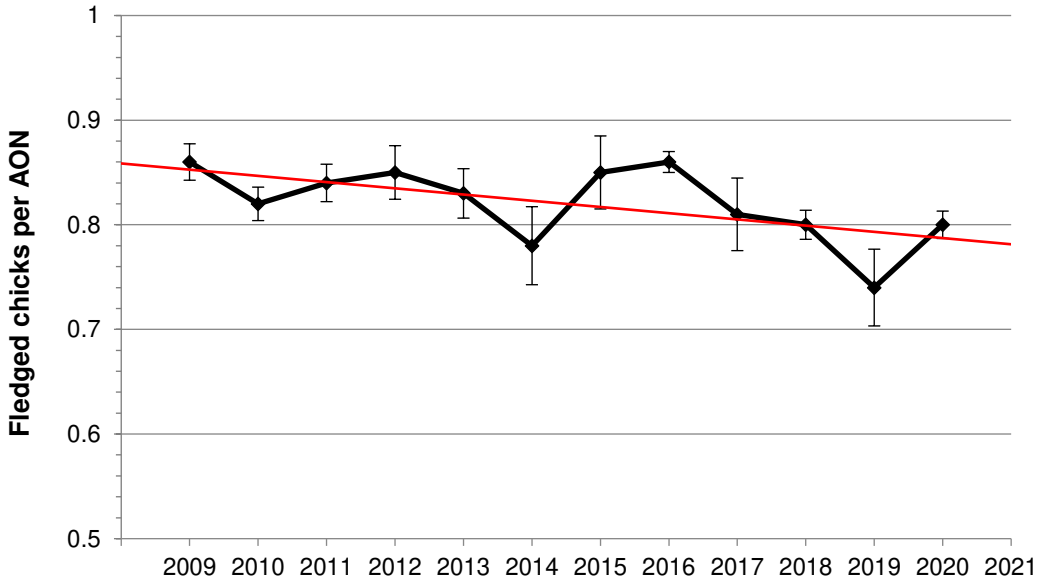

Figure 4: Northern Gannet productivity 2009-2020, mean of plot results plus/minus SE.
**N.B.: Northern Gannet productivity monitoring followed a simplified methodology in 2020, with only two visits, one early on during the chick hatching period and one later in the season before first chicks were due to fledge.*

Northern Gannet productivity recovered after the lowest productivity recorded in 2019 since monitoring began in 2009, with a mean and aggregate 0.80 chicks fledged per pair. A newly established nest site was monitored at Nettletrip after a pair had been prospecting for a few years and they successfully fledged a chick. Gannet numbers continue to grow at this colony, resulting in the displacement of other seabirds off breeding ledges, Guillemots in particular.

Black-legged Kittiwake *Rissa tridactyla*

Seven productivity plots were monitored between May and August, all of which were between Flamborough and Bempton. Due to limited resources and restrictions, no monitoring was undertaken at Filey in 2020. Plots were photographed in late-May and up to 60 AON were

marked on laminated photographs. 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 at each AON was recorded (if seen) each visit. Chicks were aged using standard codes to establish fledging or failure.

Mean productivity for Kittiwake was 0.61 (SE ± 0.0322) chicks per AON. A total of 363 AON were monitored across 7 plots, from which 222 chicks successfully fledged (Table 4, Figure 5). The mean productivity for Kittiwake recorded between 1986-2005 from between 30 and 61 colonies annually was 0.68 (SE ± 0.03) chicks per AON (Mavor *et al.,* 2008).

Table 4: Black-legged Kittiwake productivity 2020.

Plot	AON	Chicks fledged	Productivity ch/pr
Jubilee Far	50	26	0.52
Bartlett Nab Near	50	36	0.72
Grandstand North Low	50	26	0.52
Carter Lane 1	56	37	0.66
Saddle Nook 2	50	31	0.62
Saddle from Breil	50	35	0.70
Back of Breil Nook	57	31	0.54
Total	**363**	**222**	
		Mean of plot productivities ± SE	**0.61 ± 0.0322**
		Aggregate productivity	**0.61**

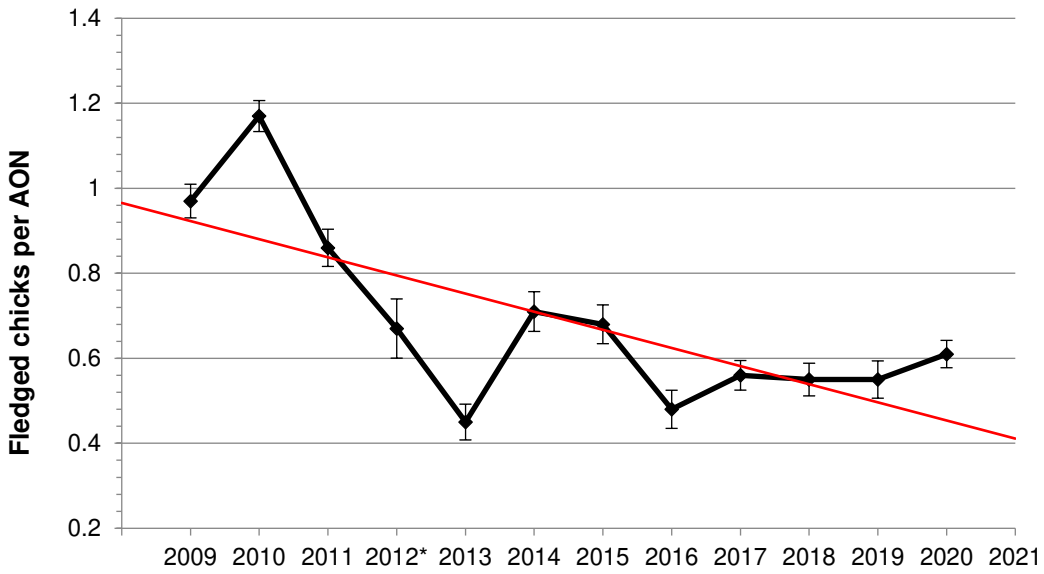

Figure 5: Black-legged Kittiwake productivity 2009-2020. Mean of plot results, plus/minus SE.
**N.B.: 2009-2011 shows the mean of plots results at Flamborough and Bempton, 2012-2020 shows the mean of plots results for the whole colony including Filey.*
**N.B.: A reduced number of Kittiwake plots were monitored in 2020 (363 sites compared to 1065 sites on average across the last 11 years), and no monitoring was undertaken in Filey.*

Kittiwake productivity increased slightly after several years of low productivity (Figure 5), however it remains lower than the national average of 0.68 between 1986 and 2005 (Mavor *et al.,* 2008). While a good number of nests hatched two chicks, very few successfully fledged more than one chick, with many sites recorded as failed despite having medium-large chicks.

There continues to be a slight but noticeable difference in productivity output within the colony between Bempton Cliffs and Flamborough Head, with the RSPB reserve showing lower overall productivity than Flamborough Head during the last five years (Figure 6).

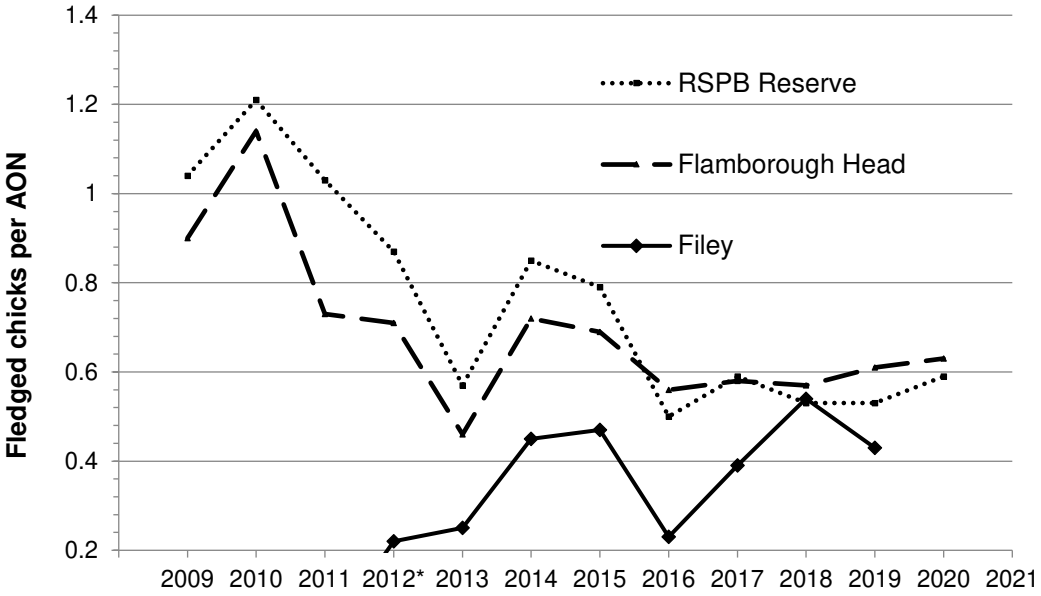

Figure 6: Black-legged Kittiwake productivity 2009-2020 comparing plots between RSPB Bempton Cliffs (dotted line), Flamborough Head (dashed line) and Filey (solid line). Results for each year is the mean of the relevant plot results.
**N.B.: A reduced number of Kittiwake plots were monitored in 2020 (363 sites compared to 1065 sites on average across the last 11 years), and no monitoring was undertaken in Filey.*

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 were 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.

Mean productivity for Herring Gull was 0.61 (SE ± 0.1685) chicks per AON. A total of 69 AON were monitored across 5 plots, from which 35 chicks fledged successfully (Table 5, Figure 7).

Table 5: European Herring Gull productivity 2020.

Plot	AON	Chicks fledged	Productivity ch/pr
Jubilee to Old Dor	12	12	1.00
Newcombe North	3	3	1.00
The Saddle Rock	22	12	0.55
Breil Nook Stack	16	4	0.25
Newcombe to Breil	16	4	0.25
Total	**69**	**35**	
		Mean of plot productivities ± SE	**0.61 ± 0.1685**
		Aggregate productivity	**0.51**

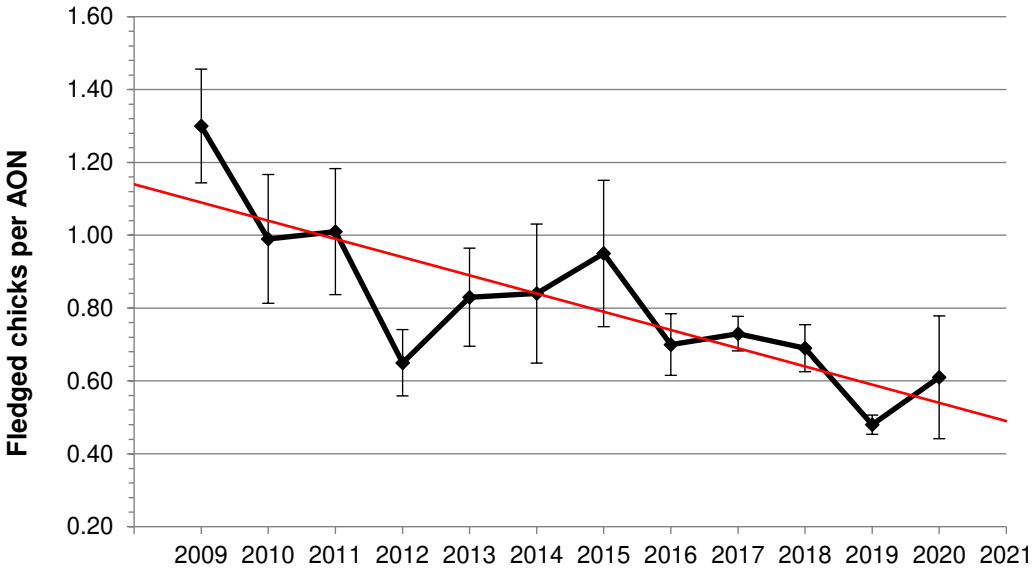

Figure 7: European Herring Gull productivity 2009-2020, mean of plot results plus/minus SE.

Herring Gull productivity appeared to recover slightly after a particularly poor year in 2019, however the large standard error shows a large variation in plot productivity success, from 1.0 on a couple of smaller plots, and 0.25 on a few of the larger plots.

Despite all the same plots being monitored in 2020 (minus the additional small plot at Swineshaw in 2019), the number of apparently occupied nests monitored was significantly lower than in previous years. This reflects general reports from volunteers of there being fewer nests visible on the cliffs. It is unknown whether birds decided not to breed due to being in poor condition or tried but failed early on and were missed (Figure 8). One nest site monitored at Flamborough hatched three chicks, the following visits rapidly saw three chicks diminish to one, followed by a sighting of the adult eating the last remaining chick, possibly suggesting the poor condition of adults or poor food availability throughout the season.

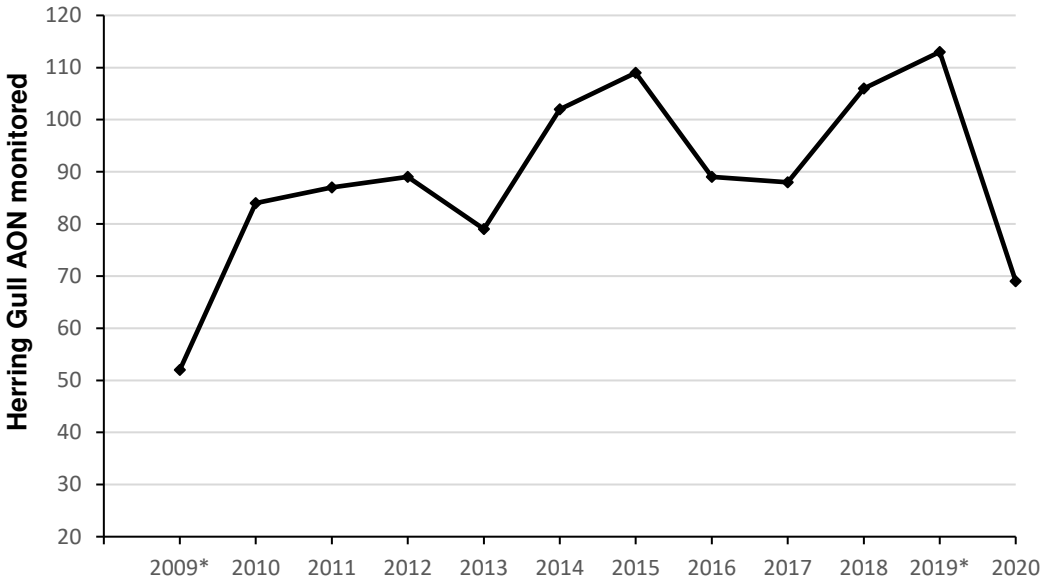

Figure 8: Number of European Herring Gull AON monitored 2009-2020.
**N.B.: In 2009 only three plots were monitored, from 2010-2018 and 2020 five plots were monitored and in 2019 six plots were monitored.*

Common Guillemot *Uria aalge*

Due to limited monitoring capacity, only four Guillemot productivity plots were monitored between 28 May and the end of July. Plots were photographed in late May and up to 70 AOS were marked on laminated photographs. Due to the late start to the monitoring programme, all sites marked as being occupied on the first visit were monitored from late May to the end of July. Visits were made once every three days, and the presence or absence of an egg or chick was recorded (if seen) each visit. Average visit time early on was 2 to 2.5 hours but reduced significantly once chicks were larger and more visible.

Mean productivity for Guillemot was 0.55 (SE ± 0.0.0867) chicks per AOS. A total of 245 AOS were monitored across 4 plots, from which 134 chicks successfully fledged (Table 6, Figure 9). The mean productivity for Guillemot recorded between 1986-2005 from between 3 and 15 colonies annually was 0.69 (SE ± 0.02) chicks per AOS (Mavor et al., 2008).

It is important to note that while the methodology once monitoring began remained the same as in previous years, the late start to the season meant that potentially any of the early egg losses will have been missed, which could affect the comparability of this year's data to data from previous years. However, the means of plot productivity and standard errors give a good indication of the overall success of the breeding season.

Table 6: Common Guillemot productivity 2020.

Plot	AOS	Chicks fledged	Productivity ch/pr
Nettletrip	65	28	0.43
Grandstand North	60	23	0.38
Grandstand South	46	34	0.74
Carter Lane 1	74	49	0.66
Total	**245**	**134**	
		Mean of plot productivities ± SE	**0.55 ± 0.0867**
		Aggregate productivity	**0.55**

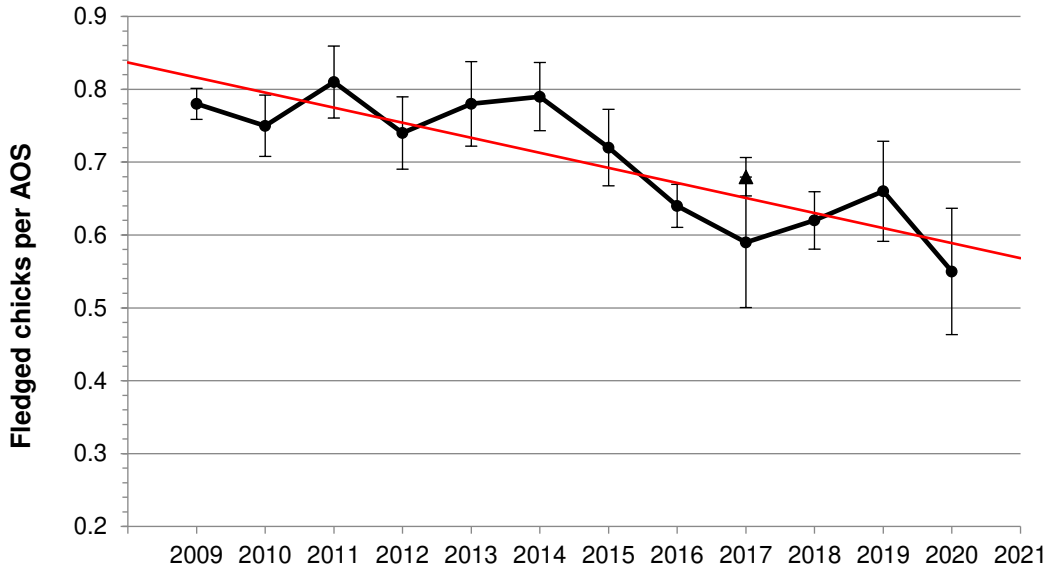

Figure 9: Common Guillemot productivity 2009-2020, mean of plot results plus/minus SE. ▲ = mean of 2017 plot results excluding Grandstand North plus/minus SE.
**N.B.: It is important to note that Guillemot productivity monitoring in 2020 followed a reduced programme, with fewer plots monitored, a late start, and an altered method of analysis to account for early egg losses.*

Guillemots appeared to have a poor breeding year in 2020, with a mean of only 0.55 chicks fledged per pair. This overall pattern reflects staff and volunteer reports of many birds occupying sites without eggs, and many chicks failing before reaching jumping age. Two plots on the reserve, Nettletrip and Grandstand North, had particular poor productivity which could be attributed to the presence of Gannets on each plot. Gannets were seen on several occasions on both plots displacing Guillemots, knocking off eggs, and even brooding Guillemot chicks. A new Gannet nest has established itself at Nettletrip, displacing 9 historic Guillemot AOS and while eight of those sites remained consistently occupied in 2020, none of them were seen to have an egg at any stage. It is not known how long it takes Guillemots to move onto a new site once displaced, which would affect the overall productivity of the colony during that time. Overall productivity on the reserve remains consistently lower than at Flamborough Head (Figure 10).

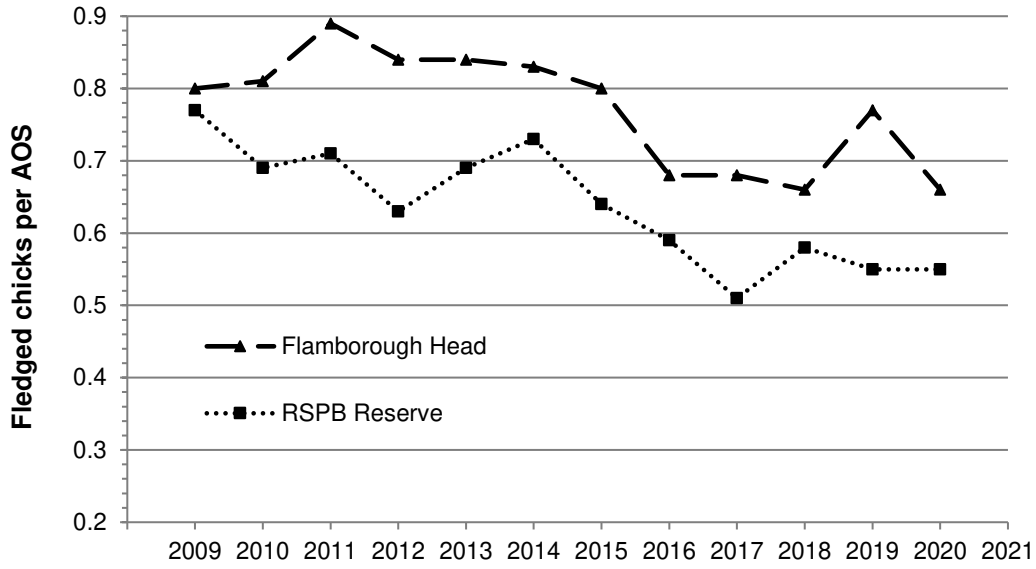

Figure 10: Common Guillemot productivity 2009-2020 comparing plots on the RSPB Bempton Cliffs reserve (three plots; dotted line) and at Flamborough Head (three plots; dashed line). Results for each year is the mean of the relevant plot results.
**N.B.: It is important to note that Guillemot productivity monitoring in 2020 followed a reduced programme, with fewer plots monitored, a late start, and an altered method of analysis to account for early egg losses.*

From 111 failures recorded across all four plots, 22% of these occurred during the chick rearing stage and 78% of them occurred during the egg incubation stage. It is well known that many eggs don't survive or hatch, however the proportionally much higher failure rate at the egg stage could suggest either the condition or fertility of the birds coming into the breeding season is having an effect on their breeding success.

Razorbill *Alca torda*

Due to limited monitoring capacity, only four Razorbill productivity plots were monitored between the 28 May and the end of July. Plots were photographed in late May and up to 70 AOS were marked on laminated photographs. Due to the late start to the monitoring programme, all sites marked as being occupied on the first visit were monitored from late May to the end of July. Visits were made once every three days, and the presence or absence of an egg or chick was recorded (if seen) each visit. Average visit time early on was 2 to 2.5 hours but reduced significantly once the chicks were larger and more visible.

Mean productivity for the four Razorbill plots monitored was 0.58 (SE ± 0.0.230) chicks per AOS. A total of 224 AOS were monitored across 4 plots, from which 130 chicks successfully fledged (Table 7, Figure 11). The mean productivity for Razorbill recorded between 1986-2005, from between 1 and 7 colonies annually, was 0.65 (SE ± 0.02) chicks per AOS (Mavor et al., 2008).

It is important to note that while the methodology once monitoring began remained the same as in previous years, the late start to monitoring meant that any early egg losses will have been missed, which could affect the comparability of this year's data to data from previous

years. However, the means of plot productivity and standard errors give us a good indication of the overall success of the breeding season.

Table 7: Razorbill productivity 2020.

Plot	AOS	Chicks fledged	Productivity ch/pr
Grandstand North	57	32	0.56
Grandstand South	41	24	0.59
Newcombe	62	33	0.53
Back of Newcombe	64	41	0.64
Total	**224**	**130**	
		Mean of plot productivities ± SE	**0.58 ± 0.0230**
		Aggregate productivity	**0.58**

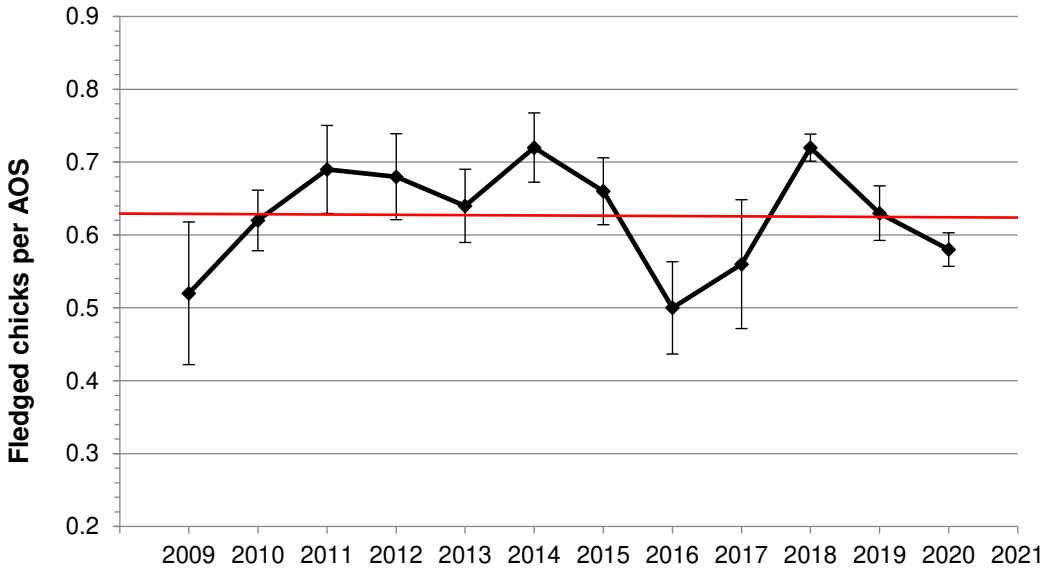

Figure 11: Razorbill productivity 2009-2020, mean of plot results plus/minus SE.
**N.B.: It is important to note that Razorbill productivity monitoring in 2020 followed a reduced programme, with fewer plots monitored, a late start, and an altered method of analysis to account for early egg losses.*

Razorbill productivity was low in 2020 compared to 2019 and 2018, however the overall 12-year trend appears stable, and variations in productivity could be attributed to natural fluctuations. Bempton Cliffs and Flamborough Head had very similar productivities in 2020 from the limited number of plots monitored (Figure 12).

A Carrion Crow nest at Saddle Nook was occupied once again, fledging at least one chick. The adults were seen taking Kittiwake eggs at Breil, however the plots monitored don't seem to have been affected by this.

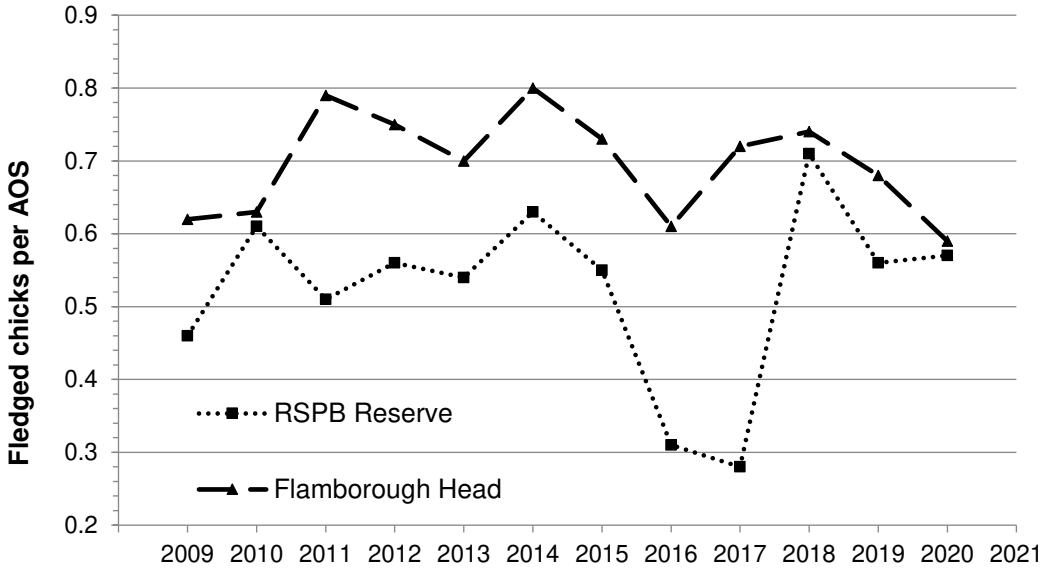

Figure 12: Razorbill productivity 2009-2020 comparing plots between RSPB Bempton Cliffs (three plots; line) and Flamborough Head (usually five plots; dashed line). Results for each year is the mean of the relevant plot results.
**Note: It is important to note that Razorbill productivity monitoring in 2020 followed a reduced programme, with fewer plots monitored, a late start, and an altered method of analysis to account for early egg losses.*

Ninety-four failures were recorded across the four plots monitored, of those 30% occurred during the chick rearing period and 70% occurred during the egg incubation period. This high failure rate during egg incubation could suggest poor condition or fertility of adults coming into the breeding season affecting breeding success.

Early season Atlantic Puffin survey

An early season Atlantic Puffin survey has been carried out or attempted for the last five years, in an effort to study large scale trends and changes in numbers throughout 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 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 year-on-year changes large scale.

The lockdown imposed throughout late March and all of April and May meant that an early season Atlantic Puffin survey could not be attempted in 2020, however the table below shows the data for 2016 to 2018 when successful counts were completed.

Table 8: Results of the early season Atlantic Puffin counts 2016-2018.
*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

Study-plot counts

The size and nature of the Flamborough and Filey Coast SPA colony means that 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 each year since 2009 (except 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, as population changes may not be detected due to movements within the colony or colony extensions, or losses rather than through changes of density across the colony. However, as the SPA holds one of the largest mainland populations in the UK, it is important that trends are monitored.

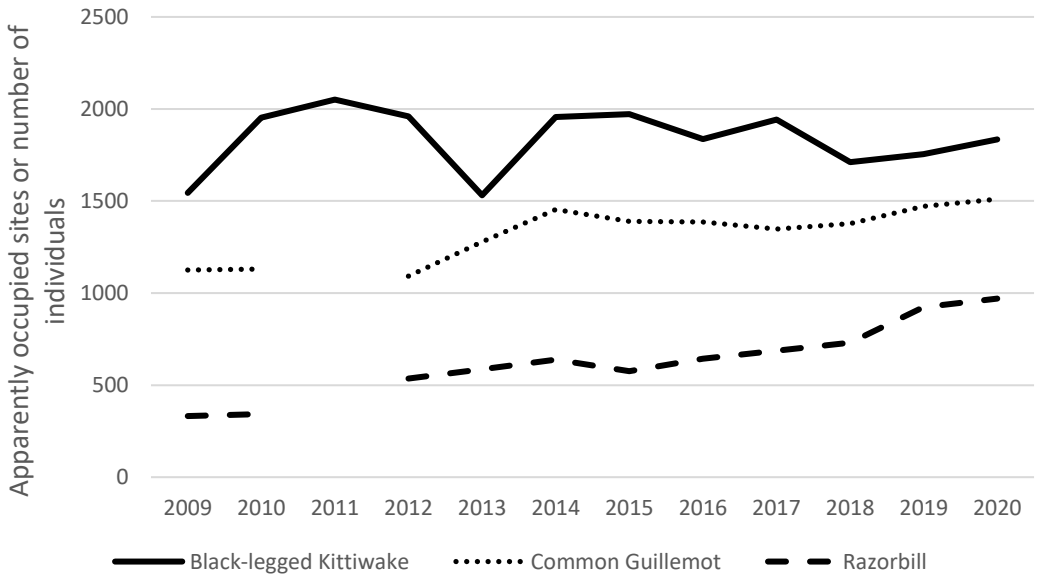

Figure 13: Historic study-plot count results for Black-legged Kittiwake, Common Guillemot and Razorbill from 2009-2020.
**N.B.: Black-legged Kittiwake counted as AON, Guillemot and Razorbill counted as individuals.*

Black-legged Kittiwake study-plot counts

Seven study-plots were counted between 0800 and 1600 on two occasions during the period from 1 June to 22 June. The mean of the two counts was 1835 AON (Table 9, Figure 14), a higher mean count than the previous two years, but generally similar to historic counts and in line with whole colony counts since 2000 which appear stable. Unusually the second count

was higher than the first unlike previous years, suggesting more sites remained occupied throughout the season, rather than being abandoned once failed.

Table 9: Black-legged Kittiwake study-plot count results – last 5 years

Visit	2016 AON Total	2017 AON Total	2018 AON Total	2019 AON Total	2020 AON Total
1	1858	1945	1733	1802	1812
2	1816	1940	1688	1705	1858
Mean	1837	1943	1711	1754	1835

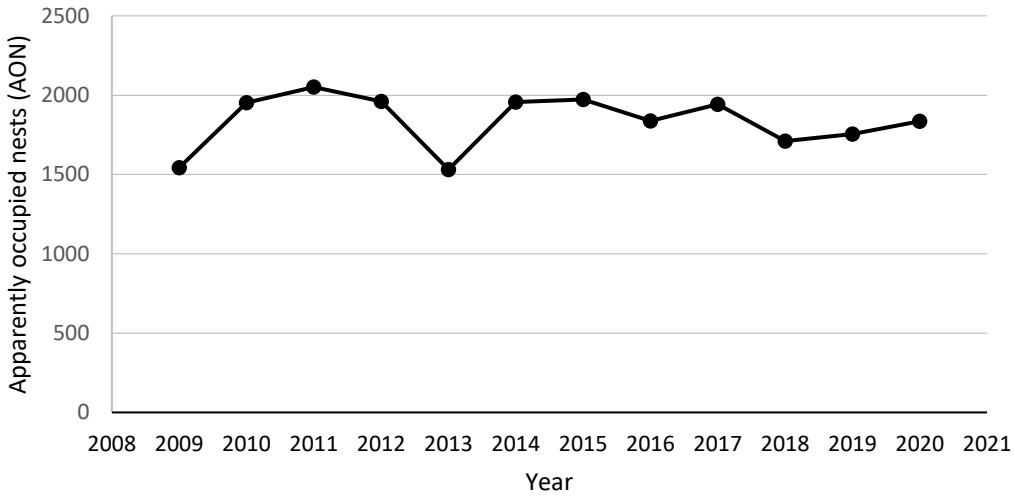

Figure 14: Number of Black-legged Kittiwake AON from 2009-2020 across seven study-plot areas.

Common Guillemot study-plot counts

Seven study-plots were counted between 0800 and 1600 on five occasions during the period from 1 June to 22 June. The mean of the study-plot counts for Guillemot was 1510 IND (Table 10, Figure 15). This was the highest mean Guillemot count to date since the study plot counts begun in 2009.

Table 10: Common Guillemot study-plot count results – last 5 years

Count	2016 Total Ind	2017 Total Ind	2018 Total Ind	2019 Total Ind	2020 Total Ind
1	1491	1335	1265	1486	1505
2	1342	1428	1363	1416	1417
3	1361	1424	1424	1428	1555
4	1351	1323	1460	1553	1528
5	n/a	1231	1372	1478	1546
Mean	1386	1348	1377	1472	1510

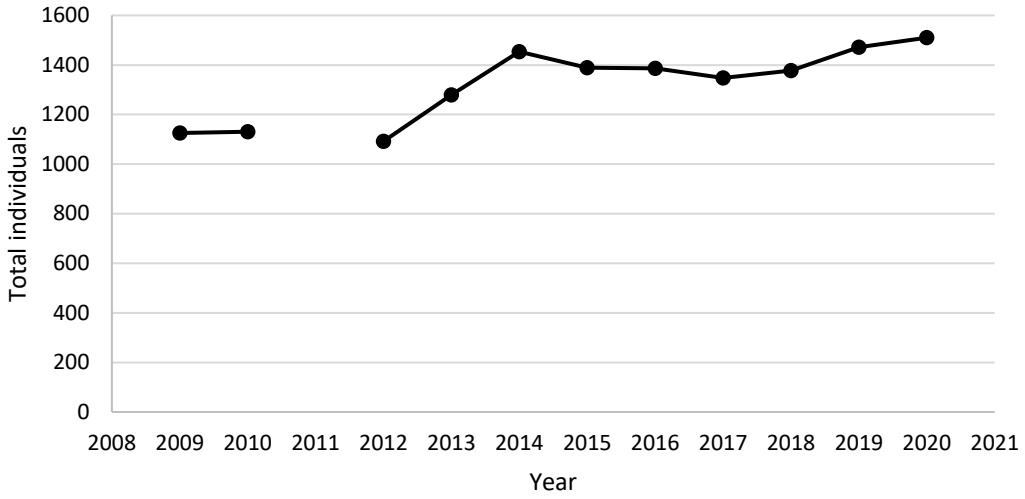

Figure 15: Number of individual Common Guillemots from 2009-2020 across seven study-plot areas.

Razorbill study-plot counts

Seven study-plots were counted between 0800 and 1600 on five occasions during the period from 1 June to 22 June. The mean of the study-plot counts for Razorbill was 970 IND (Table 11, Figure 16). This is the highest mean count for Razorbill to date and continues a year-on-year increase over the last six years, in line with the general upward trend in Razorbill productivity at this colony and whole colony growth.

Table 11: Razorbill study-plot count results – last 5 years

Count	2016 Total Ind	2017 Total Ind	2018 Total Ind	2019 Total Ind	2020 Total Ind
1	570	731	753	832	868
2	654	700	718	842	944
3	686	657	766	859	1087
4	660	689	766	1004	998
5	n/a	658	650	1077	951
Mean	643	687	731	923	970

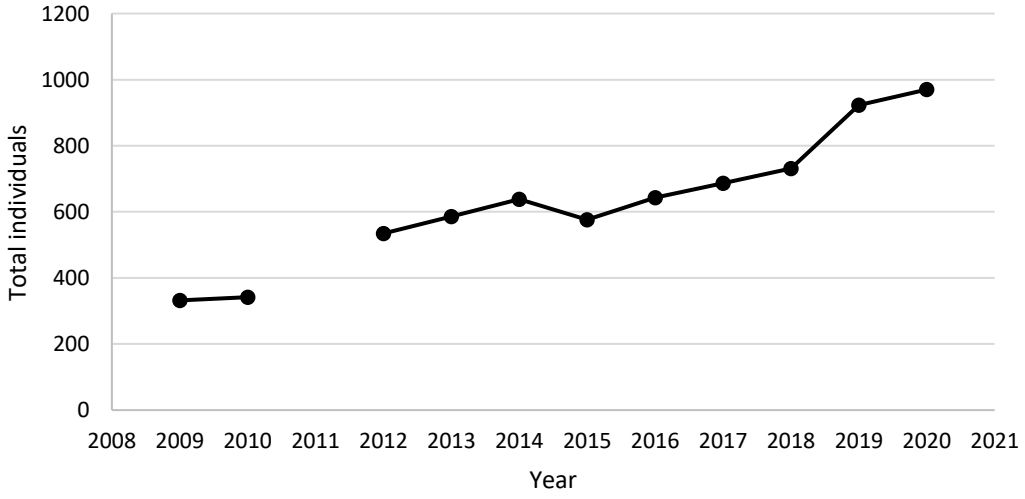

Figure 16: Total number of individual Razorbills from 2009-2020 across seven study-plot areas.

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

Despite Covid-19 restrictions, RSPB staff managed to complete a third year of a Black-legged Kittiwake RAS colour ringing project at North Landing, Flamborough. At the beginning of 2020 the project was formally registered as a RAS with the BTO with data from the 2018 and 2019 field seasons contributing to the study. The results from this project will compliment detailed population and productivity monitoring already carried out within the SPA for this species and provides a key monitoring tool for assessing the health of the colony.

Due to national lockdown restrictions, resighting effort was not possible early in the season. However, once restrictions eased effort commenced at pace. In contrast to last year where colour ring reading stopped at the egg incubation stage, as a result of lost time the team continued resighting throughout incubation, into chick provisioning and during catching resulting in an excellent return on individual birds being recorded.

In 2020, a total of 92 individuals were resighted from a potential 111 birds (51 colour ringed birds in 2018 and 60 colour ringed birds in 2019). An additional 19 breeding adults were added to the project this year, again fitted with a plain colour ring (green in 2020) above a metal BTO ring on the right leg, and an alpha -numeric yellow colour ring starting with the letter X on the left leg, providing the project with a potential sample of 130 birds.

The project is on track to achieve the minimum 5-year RAS requirement to enable reliable survival estimates to be calculated, with three more years of resighting effort and additional colour ringing to maintain current sample levels.

To date there have been two reports of colour ringed birds away from the colony outside of the breeding season; the first was in Aberdeen Harbour on 22 September 2019 and the second in Gormanston, Co. Meath, Ireland on 1 September 2020.

European Shag colour ring re-sighting

Winter roost counts of Shag, begun in 2014 at Breil Nook, Flamborough Head, were discontinued in 2017 after several years of counts did not show the numbers originally anticipated. It remains possible that this is due to the impracticality of seeing some of the areas used to roost from land and with little to no access to boat-based observations in winter.

Throughout the seabird monitoring season, however, colour ring codes are recorded, and during the autumn and winter ad-hoc visits are made in appropriate conditions. In each case records are submitted to the Centre for Ecology & Hydrology's winter Shag distribution project. Colour ring re-sightings provide valuable insight into the origins and movements of Shag using the colony. To date, 33 individuals have been re-sighted (Table 12).

Table 12: European Shag colour ring re-sightings at Flamborough Head 2014-2020

Code	BTO ring number	Year Ringed	Age	Colony	First and last date recorded at Flamborough Head
EUH		2014	Pullus	Fidra	10/11/14 - 13/05/17
CLR		2014	Pullus	Farnes	10/11/14 - 21/10/15
END	1478565	2014	Pullus	Inchmickery	10/11/14 - 22/05/17
CHC	G8898	2006	Pullus	Isle of May	25/11/14 - 04/08/17
CNE		2014	Pullus	Farnes	04/12/14
ACE	1472974	2014	Adult	Craigleith	19/01/15 - 18/02/16
ESB	1478625	2014	Pullus	Inchmickery	19/01/15
ARI		2014	Pullus	Craigleith	24/07/15
NEJ		2015	Pullus	Farnes (Inner)	21/10/15
DAN	1485389	2016	Pullus	North Sutor, Inverness-shire	06/02/17- 22/07/20
UWE		2016	Pullus	Farnes (Inner)	20/05/17
FTA		2016	Pullus	Isle of May	21/05/17
IAX		2016	Pullus	Isle of May	21/05/17
HUD		2016	Pullus	Isle of May	22/05/17 - 07/08/17
DAN		2016	Pullus	Isle of May	04/08/17
LRR		2016	Pullus	Farnes	13/06/18
TPC	1396622	2009	Adult	Craigleith	10/11/14 - 28/02/17
RZF		2013	Adult	Farnes	21/10/15
PCA		2010	Pullus	Farnes (Staple)	21/10/15 - 26/08/16
AUL	1483281	2015	Adult	Isle of May	18/02/16 - 06/02/17
AFP		2014	Pullus	Isle of May	10/11/14- 18/04/19
AUH	1483074	2014	Pullus	Isle of May	18/02/16 - 31/10/18
ADA	1473962	2014	Pullus	Isle of May	18/02/16
IPJ		2016	Pullus	Isle of May	13/09/16 - 3/10/18
DAP	1472058	2015	Pullus	Isle of May	11/03/17
IDT		2016	Pullus	Isle of May	04/08/17
CUX	1472024	2015	Pullus	Isle of May	13/02/17
HZA		2015	Pullus	Isle of May	19/06/17
EZS		2018	Pullus	Farnes	10/10/18 - 31/10/2018
NDC		2014	Pullus	Isle of May	10/11/14
FTX		2012	Pullus	Isle of May	16/12/14
CTF		2018	Pullus	Isle of May	15/11/18
AFN	1453306	2011	Pullus	Isle of May	28/02/17

Recreational disturbance

Since 2013, the Flamborough Head European Marine Site (EMS) Management Scheme has been monitoring the frequency and impacts of recreational activities around the site. Volunteers record disturbance events around the Flamborough to Filey stretch of coastline, this data is then passed to the EMS Project Officer, Rachel Riddell. The data is then used to inform and support management of the Flamborough Head EMS. 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. In 2020, recreational disturbance monitoring has gone ahead, although due to COVID-19, the Management Scheme expects there to be a reduction in the number of overall disturbance reports.

Thanks to the data collected, the Management Scheme has been able to work with various user groups to establish a number of voluntary codes of conduct. Between 1 March and 30 September, local angling clubs have agreed to a closed season for cliff-top angling along the length of the RSPB Bempton Cliffs Nature Reserve. Due to COVID-19, meetings between the Management Scheme, RSPB, Natural England and the local angling clubs have been unable to take place this year, but it is hoped these meetings will resume in 2021.

The Project Officer continues to work with personal watercraft (Jet Ski) users, local authorities, Natural England, the Marine Management Organisation and the RSPB to ensure that effective management measures are in place to mitigate disturbance from personal watercraft. A voluntary code of conduct is in operation between 1 March and 30 September for personal watercraft which aims to reduce disturbance to the breeding seabird colony and improve awareness of the site's sensitivities. Furthermore, the Management Scheme continues to work with a wide variety of partners to explore other mitigation measures

In August 2020, the Management Scheme, in partnership with the RSPCA, Humberside and North Yorkshire Police, and other key partners, organised a pilot 'awareness day' under the banner of 'Operation Seabird'. 'Operation Seabird' aims to engage, educate and raise awareness of disturbance caused by recreational activities at sea. This first event provided a uniformed presence at key areas along the coast between Bridlington and Scarborough, where officers engaged with user groups to raise awareness of the sensitivities of the coastline. The Management Scheme is hopeful that 'Operation Seabird' will be a useful tool for encouraging more responsible behaviours in the marine environment and will work with partners to establish further events in 2021.

Comments

Seabird monitoring through a pandemic

The results of Covid-19 had a significant impact on the Flamborough and Filey Coast SPA Seabird Monitoring Programme. While some aspects could be salvaged, the much-reduced monitoring team along with the late start to the fieldwork meant that monitoring was limited. The annual seasonal Seabird Research Assistant contract did not go ahead, nor were we able to have a Seabird Researcher residential volunteer or the usual large team of dedicated seabird monitoring volunteers; for this reason, monitoring needed to be prioritised. Although with much smaller sample numbers, all six of the eight seabird species were monitored this year, with a focus on trying to achieve a sample number of 250 nests or sites where possible. Four of each Razorbill and Guillemot plots were monitored, chosen at random, and a sample of between 220 and 250 sites was achieved. Seven Kittiwake plots were monitored covering a total of 363 nests between Bempton Cliffs and Flamborough Head. Unfortunately, limited monitoring capacity and restrictions meant that no monitoring could be undertaken in Filey. The same number of Gannet plots were monitored, however following a simplified methodology. Herring Gull and Fulmar productivity monitoring resulted in only a small sample but sufficient enough to give an insight into the success of their breeding season.

The 2020 overall productivity results from the reduce samples sizes were varied for most species and poor for gulls. Guillemots had a considerably lower productivity than in previous years, Razorbills had lower productivity although the trend appears stable, Herring Gulls and Kittiwakes recovered slightly after a low year in 2019 but their downward trends continue to be of concern, Fulmar continue to fluctuate year to year with a low productivity in 2020 and Gannets increased slightly after their lowest productivity to date in 2019.

The study-plot counts were successfully completed in June, providing an important insight into population numbers at this colony. Kittiwake numbers appear stable at the moment, however their low productivity for the last five years is a cause of concern. Being long-lived seabirds, it will take time for the effects of repeated low productivity to show within the colony, making it important to highlight any changes in population numbers early on. Razorbill numbers continue to rise, and the number of individual Guillemots was the highest it has been since the counts began in 2009.

Black-legged Kittiwake productivity

With a typical lifespan of twelve years, Kittiwakes spend their first few years at sea and come back to land to breed from their fourth year. Being such long-lived species, the effects of consistently low productivity at this colony in the last few years might only be felt in years to come, reinforcing the value of long-term monitoring when understanding population trends and influencing important conservation decision making.

Kittiwake productivity recovered slightly in 2020 compared to poor breeding success in recent years, however it remains of concern when compared to historic figures and the mean of 0.80 chicks fledged per pair thought to be required to maintain a stable population (Coulson, 2017). Low productivity at colonies around the UK seems to be attributed to a reduction in sandeel availability due to sea surface temperatures rising due to climate change (Arnott and Ruxton

2002). Another factor influencing productivity and adult survival is the presence of sandeel fisheries in the North Sea reducing sandeel stocks (Frederiksen *et al.,* 2004; Daunt *et al.,* 2002; Wanless *et al.,* 1998). Kittiwakes, unlike other diving species breeding at this colony, are only able to catch prey near the surface making them particularly sensitive to changes in prey abundance and fluctuations in sea surface temperatures.

Kittiwakes remain a conservation priority at this colony due to their national red-listed conservation status and low annual productivity. Alongside productivity monitoring and study-plot counts each year, a Kittiwake Retrapping Adults for Survival colour-ringing project has been established at North Landing, Flamborough to study long-term adult survival. While the project is still in its infancy, it was completed for the third consecutive year this season and will provide valuable data on adult survival in years to come.

Guillemot displacement and productivity

Guillemot productivity saw a drop in 2020 with the lowest productivity recorded since the monitoring programme began in its current form in 2009. While we missed the very start of the season throughout most of the egg laying and incubation period, there were many reports from staff and volunteers of birds occupying sites without an egg or chick, as well as chicks failing before reaching fledging age. The late start to the monitoring meant that potentially any early egg losses will have been missed, however the poorer than average productivity would suggest that missing these early eggs hasn't given an artificially high productivity.

Two plots on the reserve suffered in particular, Nettletrip and Grandstand North, which could be linked to the presence of Gannets. The Gannet population on the reserve has increased exponentially since the first few were seen on the cliffs in the 1930s (up to 13,392 pairs in 2017), and with their numbers continuing to increase, competition for nest sites is becoming more and more apparent. Gannets have often been observed displacing breeding Guillemots off ledges, and a new nest site in 2020 at Nettletrip saw the displacement of nine historic Guillemot breeding sites. At least six of these pairs remained on their sites, however none were seen to have an egg and none fledged a chick. It isn't known how long it would take a Guillemot to move on to a new site having been displaced, however this will affect the overall productivity of the colony during this time. Gannets were also on several occasions seen brooding Guillemot chicks having displaced the adult, and while appearing to care for the young the outcome for the chick will have been bleak.

Razorbill and Guillemot diet studies

Seabirds are critical indicators of the health of our oceans and are facing many pressures including climate change, over-fishing and habitat degradation (Croxall *et al.,* 2012). Any changes in the lower trophic levels with plankton, sandeels and fish will have a significant effect on the food sources available to the birds at this colony, making it critical to understand how these changes are affecting our birds.

Razorbills and Guillemots are more adaptable to changes in prey sources than species such as Kittiwakes, so monitoring the changes in their prey is a valuable way of monitoring the variation in fish availability in the North Sea. Furthermore, many species regurgitate to their chicks and are therefore difficult to study, however Razorbills and Guillemots bring whole fish

back to their chicks in their bills, affording researchers an opportunity to identify them in the field without any disturbance to the colony.

Auk chick diet has been studied in some capacity at this colony for the last eleven years, however no work could be carried out this year. There were plans for a MSc student to carry out monitoring of Guillemot and Razorbill diet but this did not go ahead due to a lot of fieldwork projects being suspended for the season. It is hoped that 2021 will provide new opportunities for a substantial project on auk chick diet giving us an important insight into auk feeding preferences at this colony. The ultimate aim of the Flamborough and Filey Coast SPA Seabird Monitoring Programme is to set up a consistent annual monitoring project to study auk chick diet, with a dedicated member of staff, volunteer or student, however this has always been difficult to resource in the past. We have yet to find a sustainable model to deliver this area of research.

Black-legged Kittiwake and Northern Gannet tracking work

An extensive GPS tracking project of Black-legged Kittiwake and Northern Gannet was planned for 2020, led by Dr Lucy Wright and Saskia Wischnewski from RSPB Conservation Science, however due to Covid-19 the fieldwork was cancelled and so could not go ahead this season. It is hoped that the tracking projects will carry over to 2021 and will continue to gather critical data on seabird movements, behaviour and foraging in the context of offshore windfarm development.

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These dedicated people include (in alphabetical order): David Aitken, Heather Davison-Smith, Scott Davison-Smith, Dannielle Jackson, Imogen Lloyd, Linda McKenzie, Dave O'Hara, Penny Wright and Rachel Riddell.

All the reserve staff and volunteers who support the project each year.

Our Conservation Science colleagues, Lucy Wright and Saskia Wischnewski, for their invaluable help with the Kittiwake RAS project and ongoing support with seabird monitoring objectives at this colony.

Natural England for granting the necessary permissions to carry out research projects and their continued support of the monitoring programme.

The Flamborough Bird Observatory for their ongoing supporting and dedicated recording of seabirds on the headland.

Members of Filey Bird Observatory & Group for their continued commitment to monitoring Black-legged Kittiwake at Filey Cliffs.

The Yorkshire Wildlife Trust who provide access to their Flamborough Cliffs reserve and ongoing support of monitoring and research projects.

The Flamborough Head Project Officer, Rachel Riddell, for her work on coordinating the recreational disturbance study and bringing together user groups to produce voluntary codes of conduct that will help protect the SPA.

LEADER for funding optics and other monitoring equipment that continue to provide essential tools for our volunteer team.

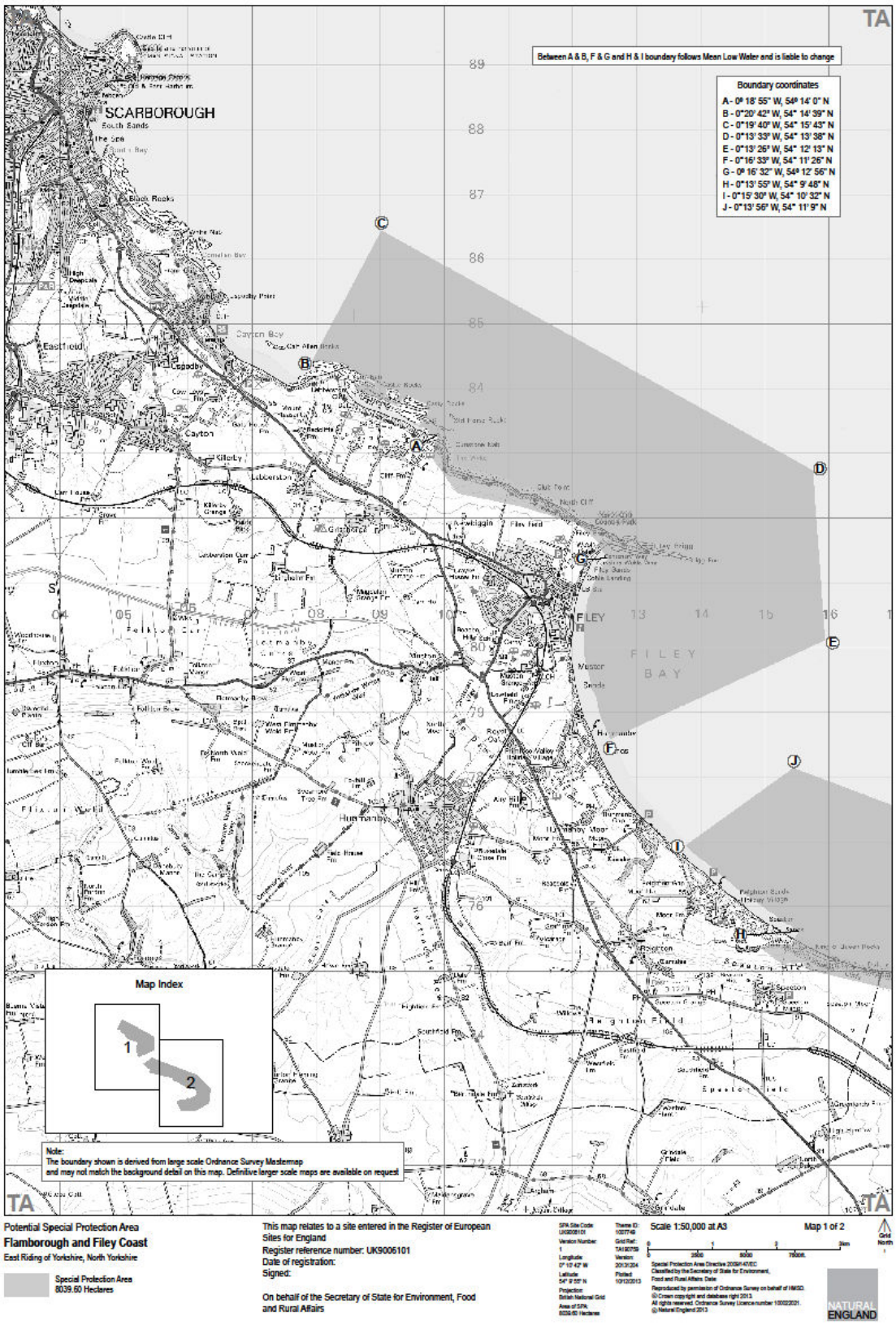
Blue Dolphin Holiday Park at Filey for allowing access to reach important sections of the colony for essential monitoring works.

And last but not least, 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



South


TA
TA
Between P & Q boundary follows Mean Low Water and is liable to change
Boundary coordinates
K- 0°4' 56" W, 54° 9' 1" N
L - 0°2' 27" W, 54° 7' 23" N
M - 0°2' 53" W, 54° 5' 52" N
N - 0°5' 41" W, 54° 4' 57" N
O - 0°8' 21" W, 54° 5' 1" N
P - 0°9' 2" W, 54° 6' 3" N
Q - 0°7' 9" W, 54° 6' 10" N
K
L
M
N
O
P
Q
Flamborough
FLAMBOROUGH HEAD
BRIDLINGTON
Hilderthorpe
B R I D L I N G T O N
Map Index
1
2
Note:
The boundary shown is derived from large scale Ordnance Survey Mastermap
and may not match the background detail on this map. Definitive larger scale maps are available on request
TA
TA
Potential Special Protection Area
Flamborough and Filey Coast
East Riding of Yorkshire, North Yorkshire
Special Protection Area
8039.60 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
Scale 1:50,000 at A3
Map 2 of 2
NATURAL ENGLAND

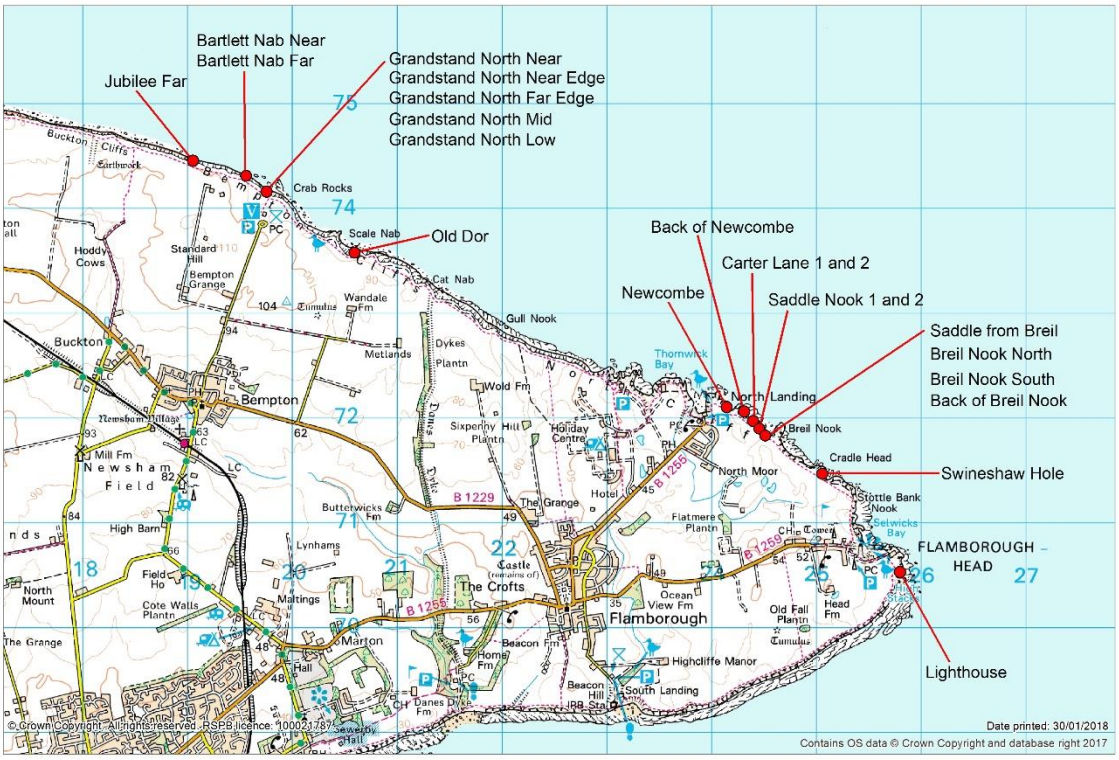
Appendix 2 - Productivity monitoring plot locations

Northern Fulmar productivity plots

Northern Gannet productivity plots

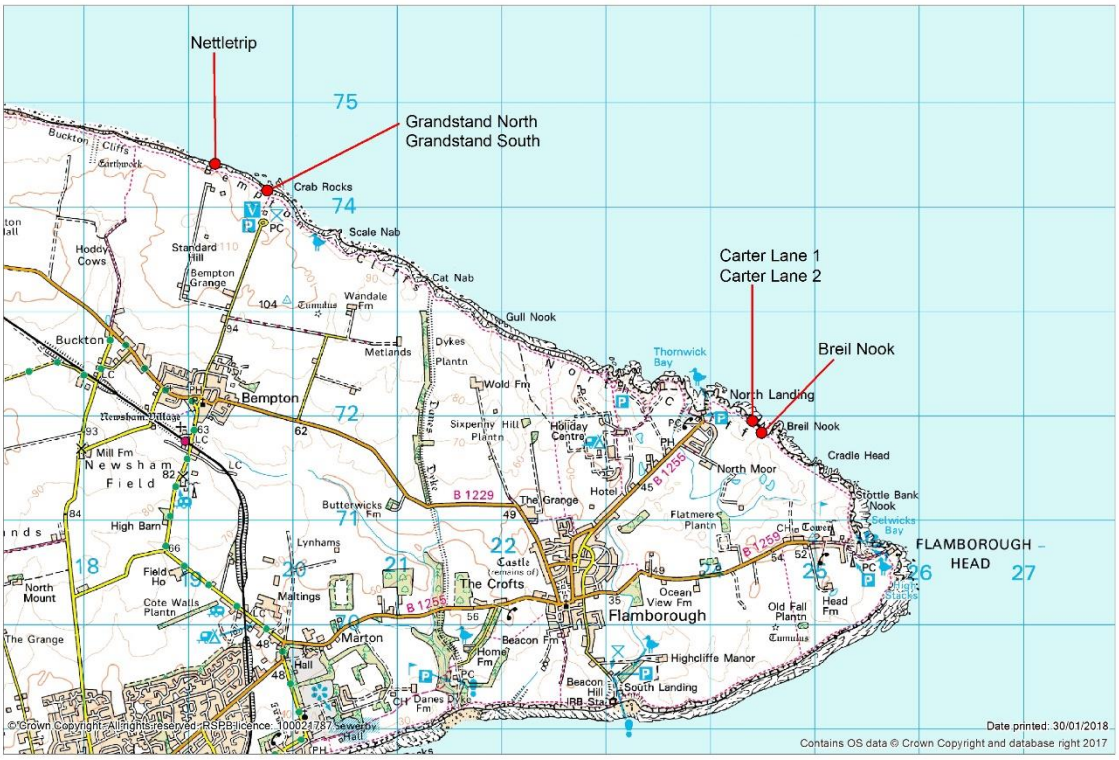
European Herring Gull productivity plots

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