DBS Offshore Wind

RWE Renewables UK Dogger Bank South (West) Limited

RWE Renewables UK Dogger Bank South (East) Limited

Dogger Bank South Offshore Wind Farms

Fsles of Scilly Guillemot and Razorbill Survey and Habitat Assessment

Submission at Deadline 4

Document Date:	April 2025
Document Reference:	14.12
Revision Number:	01
Classification:	Unrestricted

RWE MASDAR

Company:	**RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited**	Asset:	**Development**
Project:	**Dogger Bank South Offshore Wind Farms**	Sub Project/Package	**Consents**
Document Title or Description:	Isles of Scilly Guillemot and Razorbill Survey and Habitat Assessment		
Document Number:	005798532-01	Contractor Reference Number:	HAR002_RWE_009

Rev No.	Date	Status/Reason for Issue	Author	Checked by	Approved by
01	April 2025	Submission at Deadline 4	RWE	RWE	RWE

Table of Contents

List of Tables

List of Figures

1.0 Introduction

RWE Renewables UK Dogger Bank South East Limited and RWE Renewables UK Dogger Bank South West Limited (DBS) are applying for a single Development Consent Order (DCO) for both the Dogger Bank South (DBS) East and DBS West offshore wind farms (hereafter referred to as 'the Projects'). To support the development of the Dogger Bank South (DBS) Offshore Wind Farms, the Projects may be required to implement compensation measures for potential impacts from the wind farm on certain seabird species. The Guillemot [and Razorbill] Compensation Plan sets out compensation measures for common guillemot (*Uria aalge*) (hereafter referred to as guillemot) and 'without prejudice' measures for razorbill (*Alca torda*) associated with the Flamborough and Filey Coast (FFC) Special Protection Area (SPA). One of the proposed compensation measures is the removal of invasive mammalian predators at pre-determined locations to improve guillemot and/or razorbill population numbers through the removal or reduction of predation pressures.

The Isles of Scilly (IoS) is a candidate island group shortlisted for assessment and consideration for guillemot and razorbill compensation.

DBS appointed Habitat Assessment & Restoration Ltd (HAR) to assess the presence of auks, and the availability of unoccupied and suitable additional nesting habitats for these species. This report presents the findings of this study.

2.0 Environmental setting

The IoS are a group of about 50 small islands and many more islets lying southwest of Cornwall about 40 to 58 km off Lands' End (Figure 1).

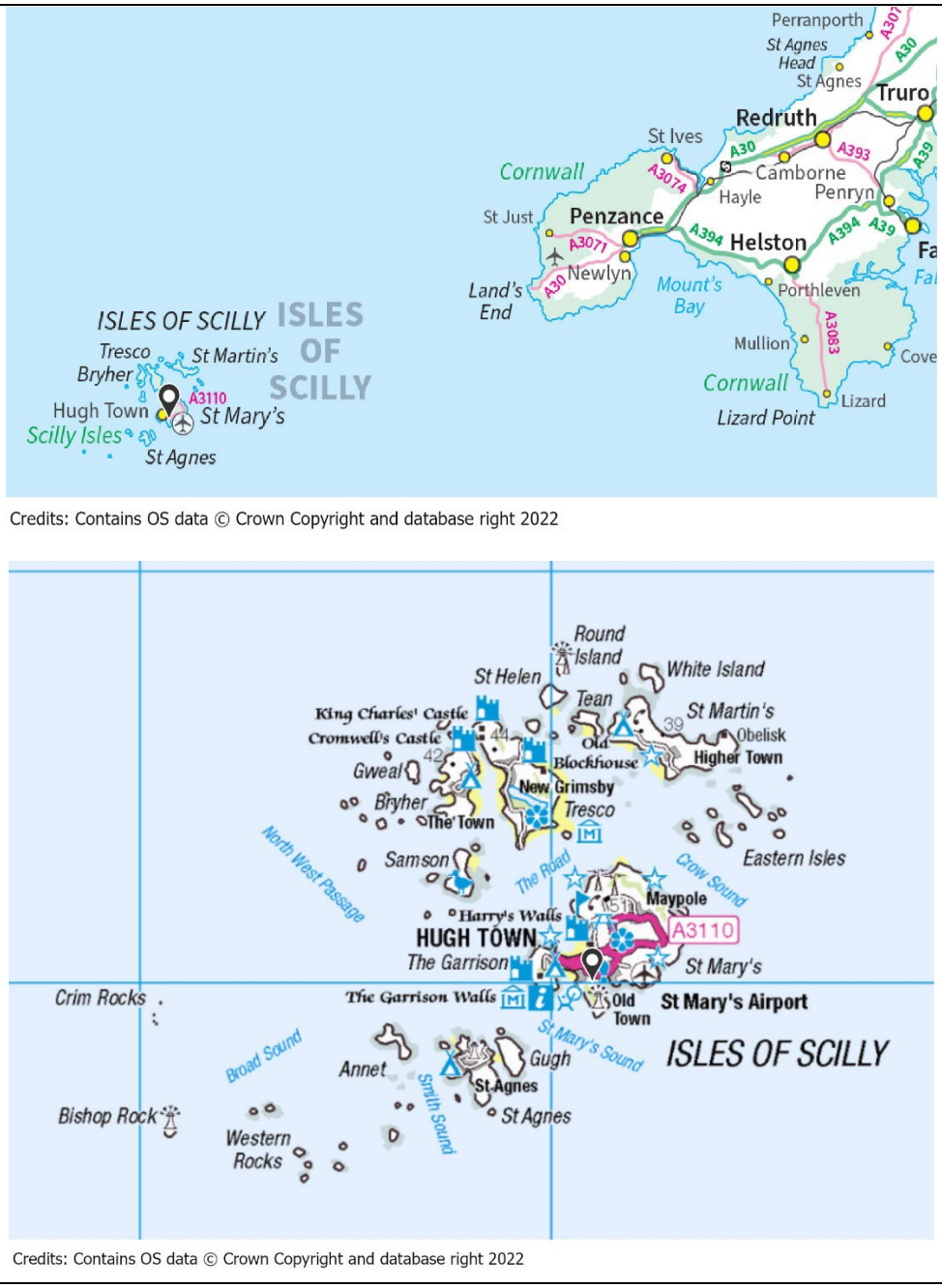


Figure 1. Scilly Isles location maps

The island group has a land area of approximately 16 sq. km. Approximately 2,300 residents live on five larger islands: St. Mary's, Tresco, St. Martin's, Bryher, and St. Agnes. The majority of the population lives on St. Mary's.

The IoS is an internationally important area for seabirds, supporting significant populations of several important species including[1]:

- Internationally important numbers of storm petrel, shag (one of the largest colonies in the UK), great black-backed gull (fourth largest in UK), and lesser black-backed gull.
- Regionally important numbers of fulmar, manx shearwater, and auks (puffin, guillemot, and razorbill).

Rats have been found on the IoS and are threatening the islands' seabirds and other wildlife. Rats were eradicated on the southern islands of St Agnes and Gugh from 2013 through 2017. The current focus for the local stakeholders are the northern locations that lie beyond 750m of the main island of St Mary's, including Round Island, Bryher, Tresco, and St Martin's, as well as up to 35 uninhabited islets in the archipelago (see Table 1).

Due to high-quality seabird habitat, the smaller inhabited islands of Bryher, Tresco, and St Martin's are strong candidates for rat eradication. Nearby uninhabited islets and rock stacks are also suitable for inclusion in a broader eradication effort. Because many of the northern islands and islets are connected at low tide and lie within distances rats can swim, they must be considered collectively as part of a single eradication project. While most northern locations need to be addressed simultaneously, there may be exceptions depending on specific island and islet characteristics.

[1] https://www.ios-wildlifetrust.org.uk/seabird-strategy

Table 1 Islet map reference, names, and locations for the northern region of the Isles of Scilly

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar

Map Reference	Islet/Island Name	Location
1	Little Gannick	49°56'37"N 6°16'27"W
2	Great Gannick	49°56'46"N 6°16'35"W
3	Great Arthur	49°56'35"N 6°`15'48"W
4	Little Arthur	49°56'48"N 6°15'54"W
5	Little Ganilly	49°56'57"N 6°16'07"W
6	Menawethan	49°56'43"N 6°14'44"W
7.1	Mouls	49°57'09"N 6°14'35"W
7.2	Little Innesvouls	49°57'01"N 6°14'44"W
7.3	Great Innesvouls	49°56'57"N 6°14'54"W
8	Great Ganilly	49°57'01"N 6°15'21"W
9	Nornour	49°57'18"N 6°15'42"W
10	Hanjague	49°57'28"N 6°14'36"W
11	St Martins	49°57'47"N 6°17'04"W
12	White Island	49°58'44"N 6°17'31"W

13	Pernagie	49°58'39"N 6°18'04"W
14	Lion Rock	49°58'55"N 6°18'07"W
15	Round Island	49°58'43"N 6°19'22"W
16	St Helen's	49°58'21"N 6°19'29"W
17	Men-a-vaur	49°58'35"N 6°20'03"W
18	Northwethal	49°57'58"N 6°19'52"W
19	Kettle Point	49°58'09"N 6°21'06"W
20	Shipman Head	49°57'55"N 6°21'35"W
21	Tresco	49°57'19"N 6°21'17"W
22	Scilly Rock	49°57'26"N 6°22'45"W
23	Gweal	49°57'13"N 6°22'09"W
24	Maiden Bower	49°56'49"N 6°23'34"W
25	Seal Rock	49°56'38"N 6°23'10"W
26	Mincarlo	49°56'01"N 6°23'08"W
27	Illiswilgig	49°56'33"N 6°22'50"W
28	Castle Bryher	49°56'36"N 6°22'24"W
29	White Island	49°55'53"N 6°21'43"W
30	Samson	49°55'53"N 6°21'07"W
31	Puffin Island	49°56'21"N 6°20'50"W
32	Guthers	49°57'01"N 6°17'49"W
33	Tean	49°58'04"N 6°18'43"W
34	Bryher	49°57'09"N 6°19'53"W

3.0 Habitat requirements for target species

The guillemot and razorbill are colonial, sea-cliff-nesting species found in the North Atlantic and Pacific (Harris and Birkhead, 1985[3]; Levers *et al.*, 2009[2]). They are both widespread along the British and Irish coasts.

Guillemot breed at varying, often high, densities on ledges (see Figure 2), in cliff niches, among boulders (see Figure 3) or on rock platforms with a preferred orientation most protected from adverse weather (Harris *et al.*, 1996[3]). Razorbill breed amongst boulders (see Figure 3), crevices on rocky cliffs or open cliffs [4]. It is common to see guillemot and razorbill nesting in mixed colonies (see Figure 3 and Figure 4).

Figure 2. Guillemots breeding in high densities on the cliff ledges of St Bee's Head, England. Photographed by HAR , 2024.

[2] Lavers, J., Hipfner, M. and Gilles Chapdelaine. (2009). Razorbill (*Alca torda*), version 2.0. In The Birds of North America (P. G. Rodewald, editor). Cornell Lab of Ornithology, Ithaca, New York, USA.
[3] Harris, M.P., Wanless, S. and Barton, T.R., (1996), 'Site use and fidelity in the Common Guillemot *Uria aalge*', *Ibis, 138*: 399-404.

[4] Source: https://www.birdlife.org/news/2022/07/19/seabird-of-the-month-razorbill-alca-torda/

Mixed colony of guillemot and razorbill nesting amongst the boulder habitat of St Tudwal's, Wales

Mixed colony of guillemot and razorbill nesting amongst the ledge and crevice habitat of St Tudwal's, Wales

Figure 3. Guillemots and razorbill nesting in a mixed colony amongst the habitat of St Tudwal's, Wales. Photographed by HAR , 2024.

For guillemot colonies, densities as high as 46 pairs per square meter (sq. m) in ledge colonies have been reported (Harris and Wanless, 1987[5]). In the book "The Atlantic Alcidae", Harris and Birkhead (1985[6]) state that guillemot breed at densities averaging around 20 pairs per sq. m. From surveys carried out across various locations around the UK, HAR ecologists found healthy colonies on good invasive predator-free cliffs and/or boulder habitats tended to be closer to 46 pairs per sq. m, with peak counts of up to 60 pairs per sq. m recorded on some highly advantageous rock platforms (Figure 4). In contrast, data on razorbill nesting densities is more limited, as razorbills tend to nest in more concealed locations, such as among boulders. However, razorbills are frequently found nesting within high-density guillemot colonies (see Figure 3), indicating similar habitat preferences and the potential for overlap in nesting areas.

St Tudwal's, Wales: approx. 40 guillemot pairs per sq. m nesting on cliff ledges

[5] Harris, M.P. and Wanless, S., (1987), 'The breeding biology of Guillemots *Uria aalge* on the Isle of May over a six year period', *Ibis, 130*: 172-192.

[6] Harris, M.P. and Birkhead, T.R., (1985), 'Breeding ecology of the Atlantic Alcidae'. In D.N. Nettleship and T.R. Birkhead (eds.), The Atlantic Alcidae *(London: Academic Press).*

Puffin Island, Wales: approx. 33 guillemot & razorbill pairs per sq. m nesting in boulder habitat

St Bees, England: approx. 60 guillemot pairs per sq. m nesting on rock platforms

Middle Mouse, Wales: approx. 48 guillemot and razorbill pairs per sq. m nesting in boulder-like habitat

Figure 4. Nesting densities of guillemot and razorbill colonies in various locations. Photographed by HAR, 2024.

Guillemots nest from the top of cliffs down to two meters above wave height at high tide and appear to show a preference for sites further away from cliff tops, sites that slope inwards, and sites that have walls (Harris *et al.*, 1997[7]).

[7] Harris, M.P., Wanless, S., Barton, T.R. and Elston, D.A., (1997), 'Nest site characteristics, duration of use and breeding success in the Guillemot *Uria Aalge*', *Ibis, 139 468-476*

They can nest on horizontal and inclined rocky ledges and platforms (greater than or equal to an estimated 0.3 m ledge depth[8]) that are substantially sloped, with slopes recorded to vary *"from +50° (sloping down, outwards) to -30° (sloping inwards)"*, but generally place their eggs on spots that are almost completely level (+5° to -5°) (Harris *et al.*, 1997).

Birds show a preference for breeding next to other species, and new breeders join existing colonies (Birkhead, 1977[9]; Harris *et al.*, 1997).

On seabird islands, guillemots and razorbill are found to nest at lower densities than ledge colonies under boulders and on ledges in cavities, which could be related to high predation pressure and/or the absence of preferred ledges.

[8] A conservative minimum 0.3 m ledge depth shall be assumed suitable for nesting guillemot and razorbill. This width aligns well with the published literature, with Birkhead (1977) recording a 0.29 m mean width for ledges occupied by guillemot.

[9] Birkhead, T.R. (1977), 'The effect of habitat and density on breeding success in the Common Guillemot.

4.0 Survey methodology

Before the surveys took place, permission for access to the main islands was obtained from the Isles of Scilly Wildlife Trust as leaseholders and the Duchy of Cornwall, as landowners, were informed.

Ian Cain and Samantha Pawley, experienced ecologists and surveyors from Habitat Assessment & Restoration Ltd (HAR), visited the Isles of Scilly (IoS) between 23rd and 28th June 2024, with support from Lydia Titterton and Edward Marshall, restoration ecologists and surveyors from Wildlife Management International Ltd (WMIL).

During the Isles of Scilly visits, an informal meeting with local stakeholders, namely the Isles of Scilly Wildlife Trust and Duchy of Cornwall, also took place to obtain local knowledge of bird populations and rat distribution.

The visit included:

- Observation surveys of the northern islands & islets from a chartered open RIB.
- Walk by survey of northern island locations. The survey was conducted on Bryher, which allowed for observation surveys of Shipman Head, Gweal, Scilly Rock, and other north-eastern isles.

4.1 Guillemot and razorbill counts

HAR surveyors undertook colony counts between the 24th and 26th of June 2024. In the field, the survey methodology followed the established methods described by Walsh *et al.* 1995[10]; Gilbert *et al.* 2011[11]. All counts from the water were made from a rigid inflatable boat (RIB) chartered from CRC Ltd, which allowed continuous and unobstructed surveillance along stretches of coastline. Counts from the land (on Bryher) were carried out for locations where the RIB couldn't gain a vantage point.

For the survey, birds were viewed with binoculars, and count data was recorded by hand in the field and transferred to digital records when ashore. In addition, a high-resolution photographic record was taken, and field counts were checked and verified on return to the office. The count unit is Individual adult guillemot or razorbill on land (above intertidal areas). A colony is an aggregation of breeding individuals sufficiently separated from adjacent groups. The total numbers of other notable seabird species were also recorded.

Where guillemot and razorbill were seen to be nesting within the northern Scillies group of islets, this was largely observed to be in concealed nest sites amongst boulders and rock crevices. This nesting behaviour meant that the usual method employed at most cliff nesting colonies of counting the

[10] Walsh, P.M., Hally, D.J., Harris, M.P., del Nevo, A., Sim, I.M.W., and Tasker, M.L. (1995), Seabird monitoring handbook for Britain and Ireland, A compilation of methods for survey and monitoring of breeding seabirds.
[11] Gilbert, G., Gibbons, D.Q. and Evans, J. (2011), Bird monitoring methods, A manual of techniques for key UK species, RSPB.

number of visible birds from a suitable vantage point would inevitably produce conservative numbers. HAR did not disturb the auks by flushing as per the methods employed by IoS Wildlife Trust for their counts in 2023[12] to improve count accuracy. Only individual guillemot and razorbill in attendance of assumed nest sites or individual non-breeding adults were counted by HAR. The count did not include birds on intertidal rocks and those on the sea. Counting auks using this method is extremely challenging and is, therefore, a best estimate. It is reasonable to assume other parent birds would have been present on the concealed nests or out at sea, and therefore, the actual number of guillemot and razorbill counted is a conservative underestimate.

4.2 Habitat assessment

Habitat visually assessed as unoccupied and matching known guillemot and/or razorbill breeding preferences (including height above high tide and splash zone, presence of existing colony, orientation of feature, protection from adverse weather, width and incline of ledge, depth of crevices etc) was photographed. The size of these areas was estimated using a laser measurement tool and scaling on photographs.

Horizontal and inclined rocky ledges and platforms (greater than or equal to an estimated 0.3 m ledge depth[13]), plus crevices and boulder fields on favourable aspects of the islands and islets were included in these estimates.

The high tide mark plus a 2 m 'splash zone' was subtracted from the measured height of the 'unoccupied' island features to provide an estimate of the total area of habitat available for additional nesting.

[12] Heaney, V., Cowen, J., St Pierre, P. & Odgers, H. (2024). *The status of seabirds breeding in the Isles of Scilly 2023*. Isles of Scilly Wildlife Trust.

[13] A conservative minimum 0.3 m ledge depth shall be assumed suitable for nesting guillemot and razorbill. This width aligns well with the published literature, with Birkhead (1977) recording a 0.29 m mean width for ledges occupied by guillemot.

5.0 Data interpretation

5.1. Guillemot and razorbill counts

After conducting field counts of the colony and cross-referencing them with high-resolution photographs (see Section 4.1 for further details), HAR applied a correction factor of 0.67 to estimate the number of guillemot and razorbill breeding pairs. This correction factor is commonly used to convert individual bird counts into estimates of apparently occupied nests, particularly for species like the guillemot (Harris, 1989; Lloyd *et al.,* 1991). HAR applied this adjustment to data collected across the northern Isles of Scilly, as raw individual counts do not accurately reflect the number of breeding pairs. Some birds are non-breeders, and others may be obscured from view, especially in boulder colonies and crevices. In addition to their counts, HAR conducted a desk-based review of the most recent data from the Isles of Scilly Wildlife Trust (Heaney *et al.,* 2023). This data was compared with HAR's findings, noting that the Ios WT used a flushing method to improve accuracy, an approach not used by HAR.

5.2. Nest site availability

Rat-free nesting space refers to suitable seabird habitat, such as cliff ledges, rock platforms, or boulder fields, free from invasive rats, eliminating the threat of egg and chick predation. These areas can support higher nesting densities and improved breeding success for guillemots and razorbills. Throughout this report, projections for rat-free nesting space have been calculated by assessing physical site characteristics, such as ledge width, slope, orientation, and proximity to the high-water mark, and applying guillemot nesting density estimates drawn from long-term ecological studies. Guillemots, which nest colonially on protected ledges and boulder-strewn platforms, have demonstrated that they can nest in densities of up to 60 pairs per sq. m. in optimal, predator-free conditions (see Section 3 as per HAR surveys). In published literature, it has been reported that guillemots reach nesting densities of around 20 pairs per sq. m. and increase to 46 pairs per sq. m. in optimal, predator-free conditions. To estimate the number of rat-free nesting spaces, we have used the more conservative densities in published literature. HAR ecologists used these benchmarks—alongside known preferences for level, inward-sloping, and sheltered ledges—to estimate nesting capacity across surveyed sites, assuming rat removal would allow guillemots to nest at higher, healthier, natural densities. Due to limited research on razorbill nesting densities, guillemot figures have been used as a proxy to represent mixed-species colonies, as both species commonly nest together in similar habitats.

The study makes projections for two different scenarios for additional guillemot and razorbill occupying suitable and unoccupied nesting space following the eradication of suspected predatory rats:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985).

- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987).

It is important to recognise that only one species of seabird can occupy any one nest site, and this is considered when discussing island-wide multispecies opportunities and projections of suitable nesting habitats The likelihood of guillemot or razorbill occupying these habitats is high as we are projecting rat-free nesting space on aspects that are most favourable for guillemot and /or razorbill to occupy.

Appendix 1 provides a tabulated, listing and detailed descriptions of the islands and islets across the northern IoS, including qualitative RAG ratings (Good, Moderate, Poor) of the suitability of the island's habitat for accommodating additional numbers of breeding guillemot and razorbill; subject to a range of external factors including food supply, interspecific and intraspecific competition, climate, available recruitment population, and removal of predation risk amongst other factors.

6.0 Results

6.1 Guillemot and razorbill counts

Guillemot and razorbill were seen to be nesting across the northern Scillies in mixed colonies (with puffin and other seabird species). The densest and most populous colony was situated on the outer islets of Men-a-vaur, Scilly Rock, and Mincarlo. Nesting behaviour was predominantly amongst boulder and crevice habitats, a characteristic habitat of the IoS (see Figure 5).

Figure 5. Images depicting guillemot and razorbill nesting behaviour across the Isles of Scilly. Photographed by HAR , 2024.

From the site surveys and literature review, Table 2 summarises the total population count for guillemots, razorbills and other seabird species:

Table 2. Total population count for guillemot, razorbill and other seabird species from two different surveys

Surveyors & Date of Survey	Species	Count (IND)	Estimate Nesting Pairs (x0.67 correction factor)
Heaney. H *et al.*, IoS Wildlife Trust, 2023[12]	Guillemot	152	101
	Razorbill	349	233
	Puffin	91	60
	Other	Shag, Fulmar, Manx-Shearwater, Storm-Petrel, Cormorant, Shag, Lesser black-backed Gull, Herring Gull, Great black-backed Gull, Kittiwake, Oyster Catcher	—
HAR, 24 - 26 June 2024	Guillemot	294	196
	Razorbill	306	205
	Puffin	89	59
	Other	Shag, Fulmar, Shag, Lesser Black-backed Gull, Herring Gull, Great Black-backed Gull, Kittiwake, Oyster Catcher, Peregrine Falcon	—

6.2 Observed nesting density

Across the IoS, HAR observed the largest numbers of guillemot and razorbill were nesting in boulder colonies located in Scilly Rock, Mincarlo and Men-a-vaur, peaking at an estimated 10.5 individuals per sq. m (see Figure 6). This is a relatively low density compared to other published colony densities, e.g., 20 breeding pairs per sq. m (Harris and Birkhead, 1985) and 46 pairs per sq. m (Harris and

Wanless, 1987). The number of breeding pairs may be restricted by invasive predatory rats, among other environmental factors.

Mincarlo: approx. 6 ind. guillemot and razorbill per sq. m

Scilly Rock: approx. 6 ind. guillemot and razorbill per sq. m

Men-a-Vaur: approx. 17 ind. guillemot per sq. m

Men-a-Vaur: approx. 13 ind. guillemot and razorbill per sq. m

Figure 6. Sample guillemot and razorbill densities across islets with breeding colonies. Photographed by HAR , 2024.

6.3 Estimated nest site availability

All islands and islets across the northern IoS were surveyed and given a qualitative RAG rating (Good, Moderate or Poor) of the suitability of the island's habitat for accommodating additional numbers of breeding guillemot and razorbill (refer to Appendix 1 for full details of Good, Moderate and Poor rated

islands and islets[14].). This report lists thirteen islets below and then describes them in detail, rating them as providing Good (the best) opportunity for additional nesting of guillemot and razorbill. It therefore offers conservative projections for the unoccupied areas of suitable nesting habitat that might exist across the whole island group.

1. Little Gannick
2. Great Arthur
3. Menawethan
4. Great Innesvouls
5. Great Ganilly & Nornour
6. Round Island
7. Men-a-vaur
8. Shipman Head
9. Scilly Rock
10. Gweal
11. Mincarlo
12. Illiswilgig
13. Puffin Island

Selected photographs taken by HAR in June 2024 showing the locations of the unoccupied suitable habitat are reproduced in the Figures in each subsection. The yellow lines marked on the photographs show the locations of the unoccupied suitable narrow ledges (estimated at a minimum 0.3m depth), and the pink areas marked on the photographs show the locations of the unoccupied and suitable habitat, including boulders, crevices, and wide ledges greater than 0.5 m in width.

6.3.1. Little Gannick

6.3.1.1 Key features

Key observed features for Little Gannick are provided in Table 3 and an aerial image of the islet is shown in Figure 7.

[14] Whilst the main islands of St Martins, Bryher and Tresco do have some suitable habitat for nesting guillemot, they have been excluded from the projections for additional nesting space due to high human presence which would deter auks from nesting.

Table 3. Key features: Little Gannick

Feature					
Map reference	1 (Table 1)				
Area	1 Ha				
Description	Exposed rock, boulder, grasses and scrub vegetation				
Maximum height above high tide mark.	10m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H *et al.*, IoS Wildlife Trust 2023	0	1	0	Shag: 14 Lesser black-backed Gull: 1 Great black-back Gull: 16	
HAR, 24 - 26 June 2024	0	12	0	Shag, Lesser black-backed Gull, Great black-backed Gull.	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 7. Aerial image Little Gannick

6.3.1.2 Habitat assessment

Selected images are shown in Figure 8.

Figure 8. Selected images showing seabird activity and islet habitat

The assessment rates Little Gannick as Good for breeding guillemot and razorbill, including an estimated 76 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **1520** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **3496** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 9.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 9. Suitable and unoccupied nesting habitat (shaded pink)

6.3.2. Great Arthur

6.3.2.1 Key features

Key observed features for Great Arthur are provided in Table 4 and an aerial image of the islet is shown in Figure 10.

Table 4. Key features: Great Arthur

Feature					
Map reference	3 (Table 1)				
Area	4.5 Ha				
Description	Exposed boulders, ledges, grass and scrub vegetation				
Maximum height above high tide mark	10.5m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H *et al.*, IoS Wildlife Trust 2023	0	0	0	Fulmar: 2 Shag: 9 Lesser black-backed Gull: 24 Herring Gull: 16 Great black-back Gull: 28	Combined Greater and Little Arthur in counts.
HAR, 24 - 26 June 2024	0	0	0	Moderate Activity: Mixed colony of Lesser & Great black-backed Gulls, Herring Gull, Shag Low Activity Oyster Catcher	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 10. Aerial image Great Arthur

6.3.2.1 Habitat assessment

Selected images are shown in Figure 11.

Figure 11. Selected images showing seabird activity and islet habitat.

The assessment rates Great Arthur as Good for breeding guillemot and razorbill, including an estimated 42 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **840** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **1932** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 12.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

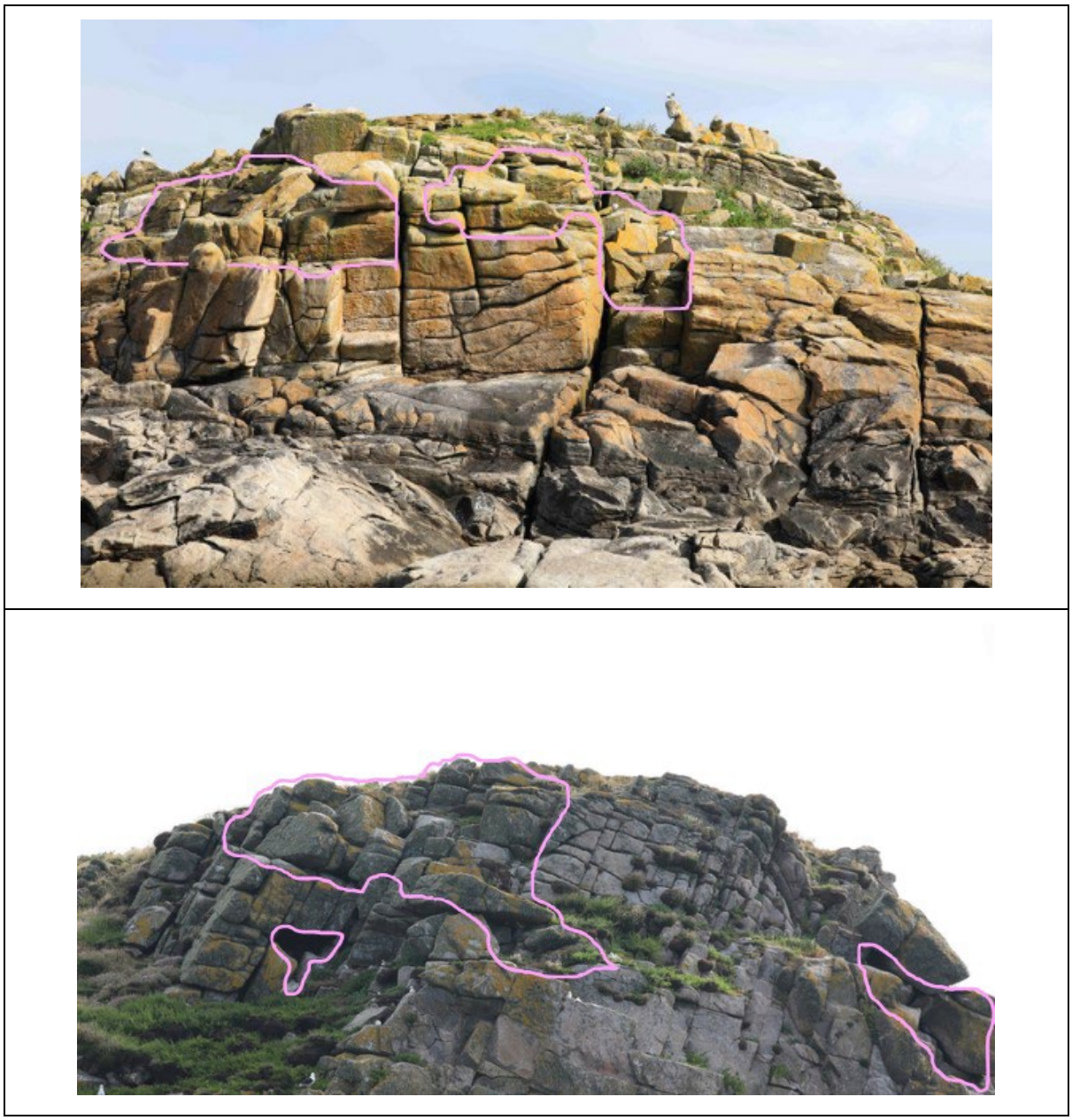


Figure 12. Suitable and unoccupied nesting habitat (shaded pink)

6.3.3. Menawethan

6.3.3.1. Key features

Key observed features for Menawethan are provided in Table 5 and an aerial image of the islet is shown in Figure 13.

Table 5. Key features: Menawethan

Feature					
Map reference	6 (Table 1)				
Area	3 Ha				
Description	Cliff faces, lose boulder and occasional grass and scrub vegetation.				
Maximum height above high tide mark	23m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H *et al.*, IoS Wildlife Trust 2023	0	0	0	Fulmar: 42 Shag: 4 Great black-backed Gull: 48	
HAR, 24 - 26 June 2024	0	7 (excl. 4 in air, 1 fledged chick)	0	Fulmar, Great black-backed Gull w/ chick, suspect Kittiwake Pair, suspect Peregrine Falcon, Oyster Catcher	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 13. Aerial image Menawethan

6.3.3.2 Habitat assessment

Selected images are shown in Figure 14.

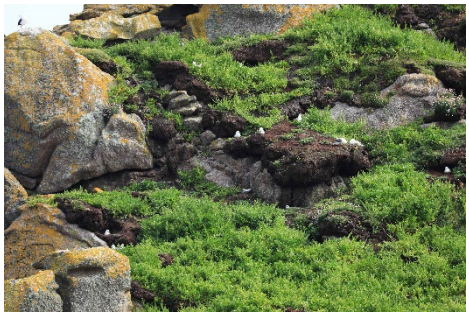


Figure 14. Selected images showing seabird activity and islet habitat.

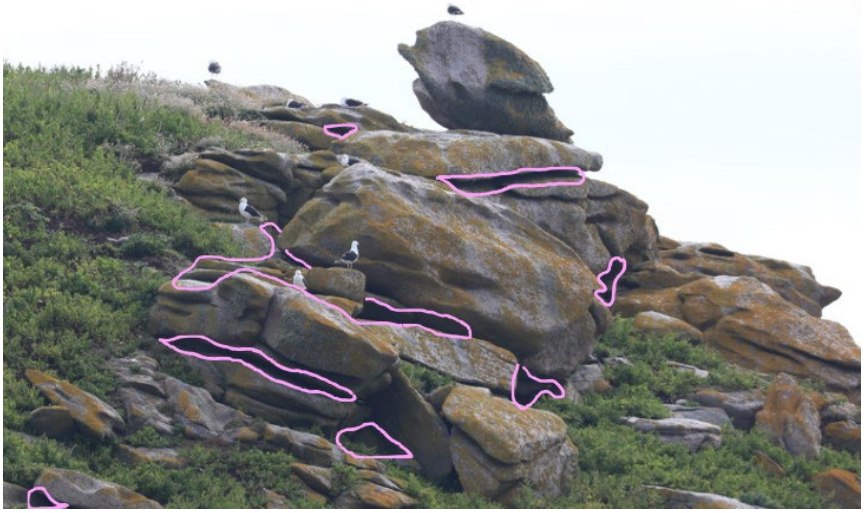
The assessment rates Menawethan as Good for breeding guillemot and razorbill, including an estimated 128.4 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

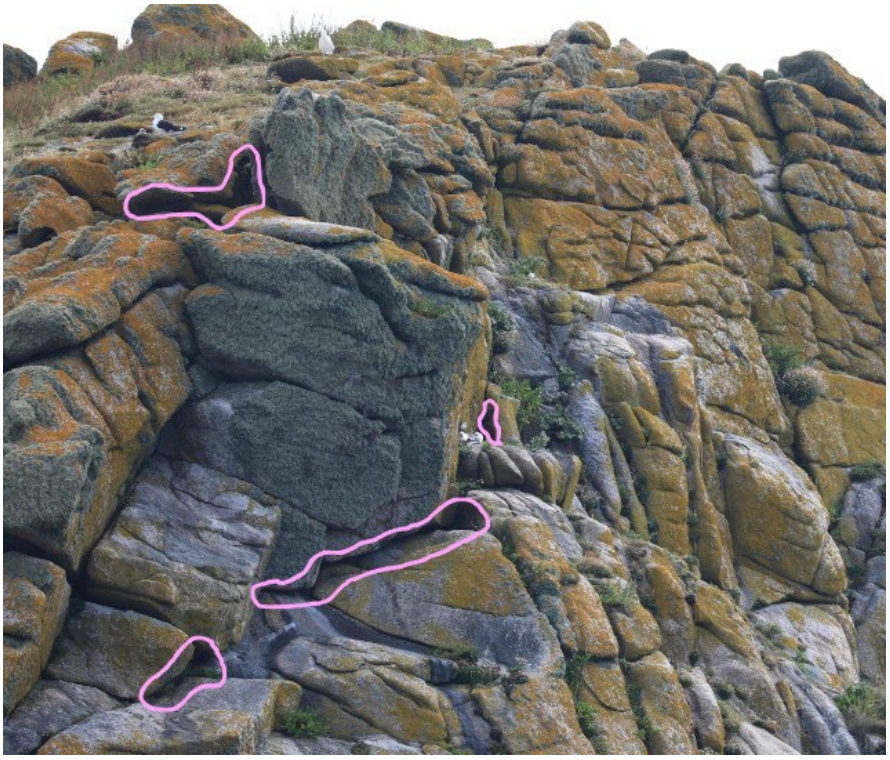
The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **2568** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **5906** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 15.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.
Name: 005856497_01_Guillemot_and_Razorbill_Study_Nesting - Menawethan





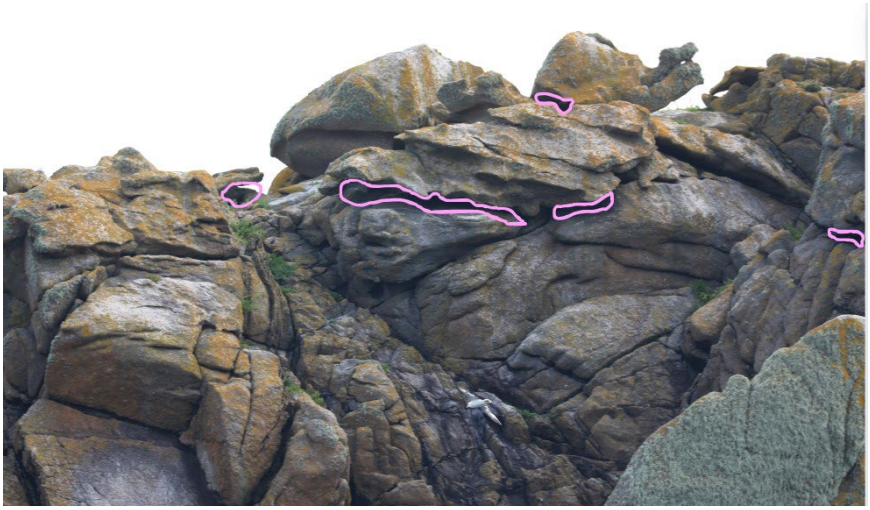


Figure 15. Suitable and unoccupied nesting habitat (shaded pink)

6.3.4. Great Innisvouls

6.3.4.1 Key features

Key observed features for Great Innisvouls are provided in Table 6 and an aerial image of the islet is shown in Figure 16.

Table 6. Key features: Great Innisvouls

Feature					
Map reference	7 (Table 1)				
Area	2 Ha				
Description	Boulders, occasional ledges, grass and scrub vegetation				
Maximum height above high tide mark	22m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H *et al.*, IoS Wildlife Trust 2023	0	19	0	Fulmar: 9 Shag: 45 Great black-backed Gull: 28	

HAR, 24 - 26 June 2024	0	28	0	Moderate Activity: Gulls, Shag Low Activity: Fulmar	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 16. Aerial image Great Innisvouls

6.3.4.2 Habitat assessment

Selected images are shown in Figure 17.

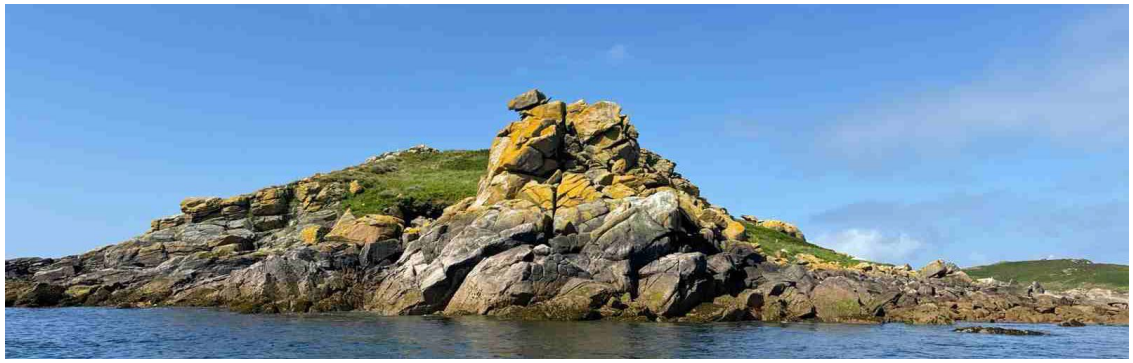


Figure 17. Selected images showing seabird activity and islet habitat.

The assessment rates Great Innisvouls as Good for breeding guillemot and razorbill, including an estimated 50.5 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **1010** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could potentially accommodate an additional **2323** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 18.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

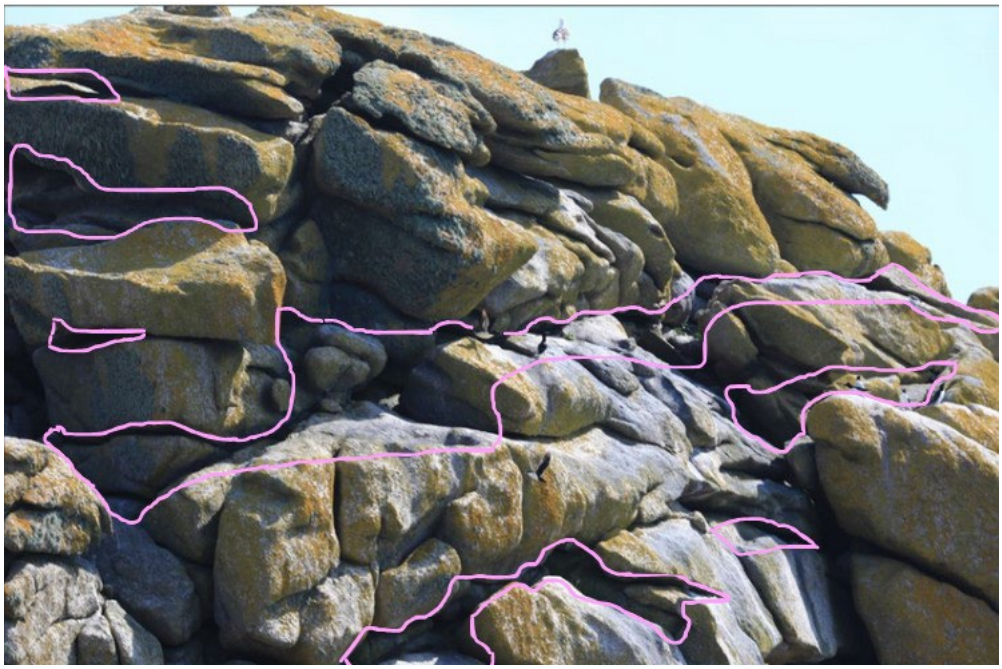


Figure 18. Suitable and unoccupied nesting habitat (shaded pink)

6.3.5. Great Ganilly and Nornour

6.3.5.1 Key features

Key observed features for Great Ganilly and Nornour are provided in Table 7 and an aerial image of the islet is shown in Figure 19.

Table 7. Key features: Great Ganilly and Nornour

Feature					
Map reference	8 & 9 (included together due to land connections at low tide) (Table 1)				
Area	13 Ha				
Description	Boulders with occasional grass and scrub vegetation. Beaches.				
Maximum height above high tide mark.	18m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H et al, IoS Wildlife Trust 2023	0	0	4	Manx-Shearwater: 3 Shag: 41 Lesser black-backed Gull: 92 Herring Gull: 18 Great black-backed Gull: 42	Combined Great Ganilly and Nornour counts.
HAR, 24 - 26 June 2024	0	5	0	Low Activity: Gulls, Shag, Fulmar, Oyster Catcher	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 19. Aerial image Great Ganilly and Nornour

6.3.5.2 Habitat assessment

Selected images are shown in Figure 20.

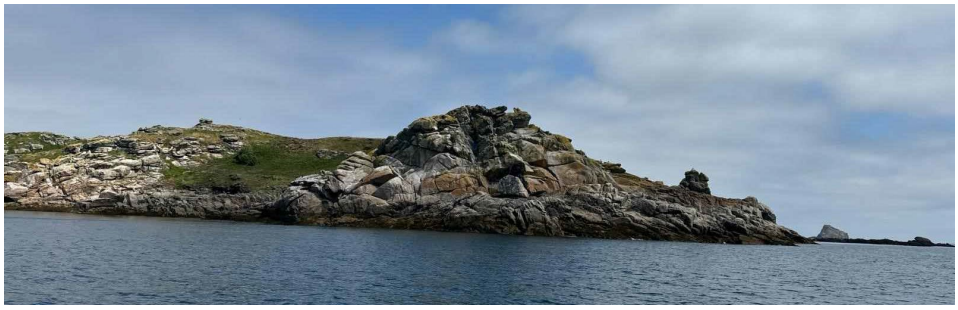


Figure 20. Selected images showing seabird activity and islet habitat.

The assessment rates Great Ganilly and Nornour as Good for breeding guillemot and razorbill, including an estimated 62 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **1240** pairs of breeding guillemot /razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **2852** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 21.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

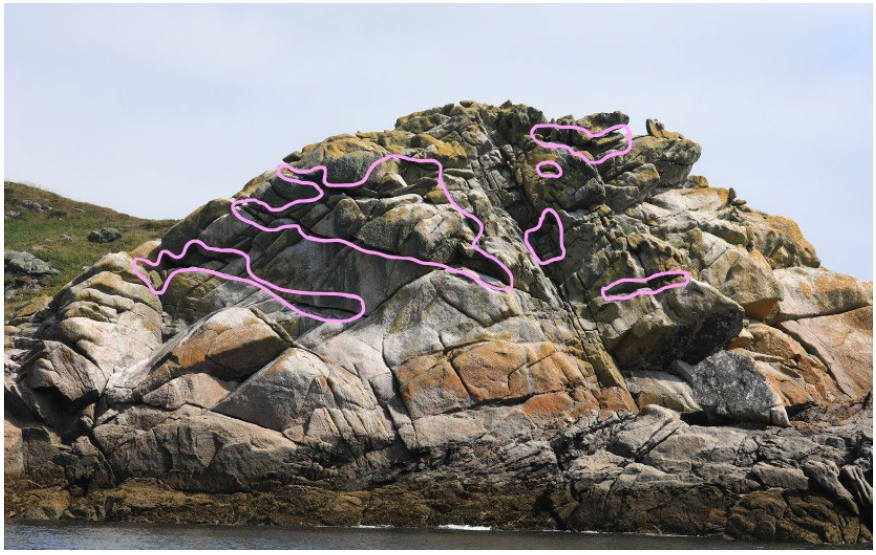


Figure 21. Suitable and unoccupied nesting habitat (shaded pink)

6.3.6. Round Island

6.3.6.1 Key features[15]

Key observed features for Round Island are provided in Table 8 and an aerial image of the islet is shown in Figure 22.

Table 8. Key features: Round Island

Feature					
Map reference	15 (Table 1)				
Area	3.5 Ha				
Description	Boulders, exposed rock with ledges, grasses and scrub vegetation				
Maximum height above high tide mark.	26m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H *et al.*, IoS Wildlife Trust 2023	5	1	0	Fulmar: 10 Manx Shearwater: 96 Storm Petrel: 105 Shag: 9 Lesser black-backed Gull: 6 Herring Gull: 1 Great black-backed Gull: 13	
HAR, 24 - 26 June 2024	0	0	0	<u>Low Activity:</u> Fulmar, Shag, Gulls	Evidence of nesting: Manx Shearwater (green strip of vegetation)

[15] Recently, the IoS Wildlife Trust attempted to eradicate rats on Round Island. However, either this was ineffective, or rats have reinvaded due to its proximity to surrounding islands (in particular, St Helen's).

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.
Name: 005856497_01_Guillemot_and_Razorbill_Study_Good_Opportunity - Round Island

Figure 22. Aerial image Round Island

6.3.6.2 Habitat assessment

Selected images are shown in Figure 23.

Figure 23. Selected images showing seabird activity and islet habitat.

The assessment rates Round Island as Good for breeding guillemot and razorbill, including an estimated 198.5 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **3,970** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **9,131** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 24.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 24. Suitable and unoccupied nesting habitat (shaded pink and yellow)

6.3.7. Men-a-vaur

6.3.7.1 Key features

Key observed features for Men-a-vaur are provided in Table 9 and an aerial image of the islet is shown in Figure 25.

Table 9. Key features: Men-a-vaur

Feature					
Map reference	17 (Table 1)				
Area	2 Ha				
Description	Exposed rock, boulders				
Maximum height above high tide mark	19 - 31m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H et al, IoS Wildlife Trust 2023	60	100	4	Fulmar: 5 Storm Petrel: 17 Shag: 1	
HAR, 24 - 26 June 2024	166	15	3	Low Activity: Peregrine Falcon, Shag, Fulmar	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 25. Aerial image Men-a-vaur

5.3.7.2 Habitat assessment

Selected images are shown in Figure 26.

Figure 26. Selected images showing seabird and raptor activity and islet habitat.

The assessment rates Men-a-vaur as Good for breeding guillemot and razorbill, including an estimated 195.4 sq. m of suitable and unoccupied boulder, ledge and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **3908** pairs of breeding guillemot /razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **8988** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 27.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 27. Suitable and unoccupied nesting habitat (shaded pink and yellow)

6.3.8. Shipman Head

6.3.8.1 Key features

Key observed features for Shipman Head are provided in Table 10 and an aerial image of the islet is shown in Figure 28.

Table 10. Key features: Shipman Head

Feature					
Map reference	20 (Table 1)				
Area	5.5 Ha				
Description	Exposed rock with ledges, boulder, grasses and scrub vegetation				
Maximum height above high tide mark	30m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H *et al.*, IoS Wildlife Trust 2023	0	30	0	Fulmar: 9 Shag: 11 Lesser black-backed Gull: 13 Herring Gull: 3 Great black-backed Gull: 4	
HAR, 24 - 26 June 2024	0	15	0	Low Activity: Gulls, Oyster Catcher, Fulmar, Shag	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.
Name: 005856497_01_Guillemot_and_Razorbill_Study_Good_Opportunity - Shipman Head

Figure 28. Aerial image Shipman Head

6.3.8.2 Habitat assessment

Selected images are shown in Figure 29.

Figure 29. Selected images showing seabird activity and islet habitat.

The assessment rates Shipman Head as Good for breeding guillemots and razorbills. It includes an estimated 123 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **2460** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **5658** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 30.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

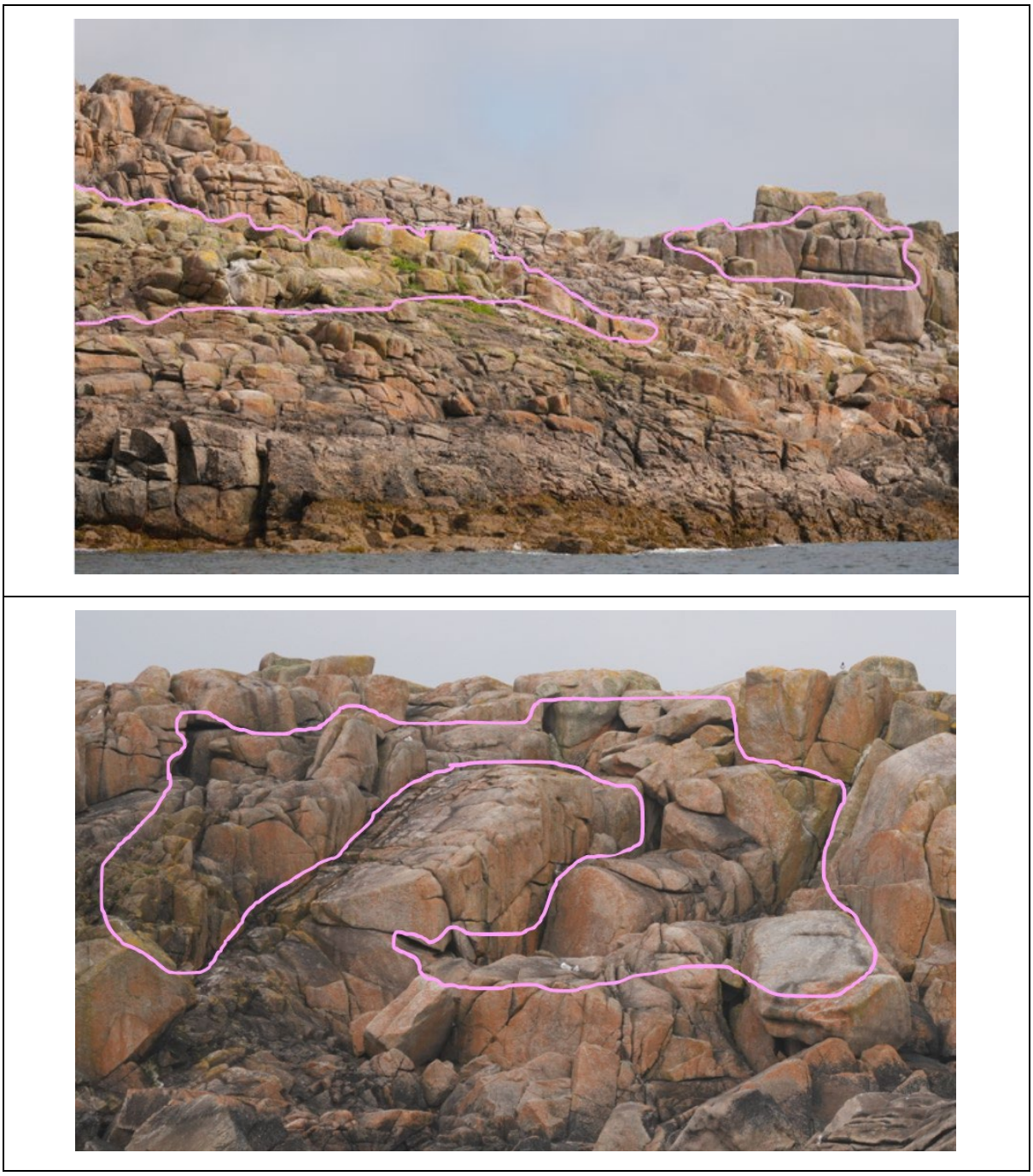


Figure 30. Suitable and unoccupied nesting habitat (shaded pink)

6.3.9. Scilly Rock

6.3.9.1 Key features

Key observed features for Scilly Rock are provided in Table 11 and an aerial image of the islet is shown in Figure 31.

Table 11. Key features: Scilly Rock

Feature					
Map reference	22 (Table 1)				
Area	2.5 Ha				
Description	Exposed rock with cliff ledges and boulders				
Maximum height above high tide mark	16m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H et al, IoS Wildlife Trust 2023	7	81	3	Storm Petrel: 25 Shag: 20	
HAR, 24 - 26 June 2024	44	113	84	Low Activity: Peregrine Falcon, Shag	There is much hidden territory as such estimates don't reflect the true count. Recommend drone survey.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 31. Aerial image Scilly Rock

6.3.9.2 Habitat assessment

Selected images are shown in Figure 32.

Figure 32. Selected images showing seabird activity and islet habitat.

The assessment rates Scilly Rock as Good for breeding guillemot and razorbill, including an estimated 66[16] sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **1320** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **3036** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 33.

[16] Estimates are very conservative as the survey showed that there is a lot of hidden territory due to the number of seabirds leaving island from hidden spaces.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 33. Suitable and unoccupied nesting habitat (shaded pink)

6.3.10. Gweal

6.3.10.1 Key features

Key observed features for Gweal are provided in Table 12 and an aerial image of the islet is shown in Figure 34.

Table 12. Key features: Gweal

Feature					
Map reference	23 (Table 1)				
Area	6.5 Ha				
Description	Exposed rock, boulder, grasses and scrub vegetation. Beaches.				
Maximum height above high tide mark	30m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H et al, IoS Wildlife Trust 2023	0	24	0	Shag: 51 Lesser black-backed Gull: 12 Herring Gull: 15 Great black-backed Gull: 26	
HAR, 24 - 26 June 2024	0	70	0	0	Suspect Manx-Shearwater Activity (green, grassy slopes) Estimates were taken on day, no photographic record.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 34. Aerial image Gweal

6.3.10.2 Habitat assessment

Selected images are shown in Figure 35.

Figure 35. Selected images showing seabird activity and islet habitat.

The assessment rates Gweal as Good for breeding guillemot and razorbill, including an estimated 50 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **1000** pairs of breeding guillemot/razorbill.

- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **2,300** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 36.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

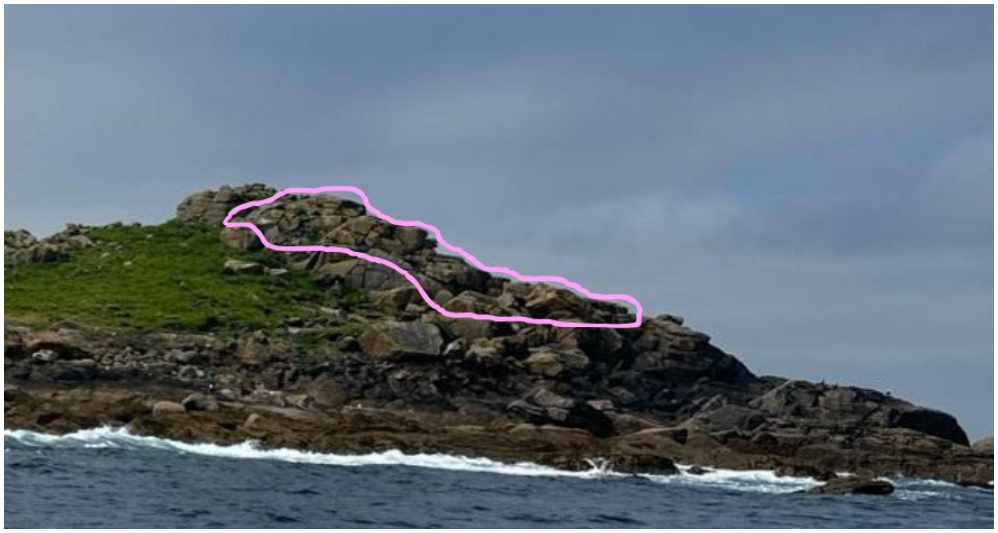


Figure 36. Suitable and unoccupied nesting habitat (shaded pink)

6.3.11. Mincarlo

6.3.11.1 Key features

Key observed features for Mincarlo are provided in Table 13 and an aerial image of the islet is shown in Figure 37.

Table 13. Key features: Mincarlo

Feature					
Map reference	26 (Table 1)				
Area	3 Ha				
Description	Exposed rock, boulders, occasional scrub vegetation				
Maximum height above high tide mark	25m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H et al, IoS Wildlife Trust 2023	80	58	80	Fulmar: 17 Storm Petrel: 14 Shag: 36 Lesser black-backed Gull: 2 Herring Gull: 3 Great black-backed Gull: 29	
HAR, 24 - 26 June 2024	84	34	2	Moderate Activity: Gulls, Shag, Fulmar	>75 Mixed Auk Colony Rafting

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 37. Aerial image Mincarlo

6.3.11.2 Habitat assessment

Selected images are shown in Figure 38.

Figure 38. Selected images showing seabird activity and islet habitat.

The assessment rates Mincarlo as Good for breeding guillemot and razorbill, including an estimated 159 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **3180** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **7314** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 39.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 39. Suitable and unoccupied nesting habitat (shaded pink)

6.3.12. Illiswilig

6.3.12.1 Key features

Key observed features for Illiswilig are provided in Table 14 and an aerial image of the islet is shown in Figure 40.

Table 14. Key features: Illiswilig

Feature					
Map reference	27 (Table 1)				
Area	1.3 Ha				
Description	Exposed rock, boulder, occasional grass and scrub vegetation				
Maximum height above high tide mark.	16m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H et al, IoS Wildlife Trust 2023	0	35	0	Storm Petrel: 17 Shag: 28 Great black-backed Gull: 9	
HAR, 24 - 26 June 2024	0	7	0	Low Activity: Gulls, Shag	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 40. Aerial image Illiswilig

6.3.12.2 Habitat assessment

Selected images are shown in Figure 41.

Figure 41. Selected images showing seabird activity and islet habitat.

The assessment rates Illiswilig as Good for breeding guillemot and razorbill, including an estimated 20 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **400** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **920** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 42.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

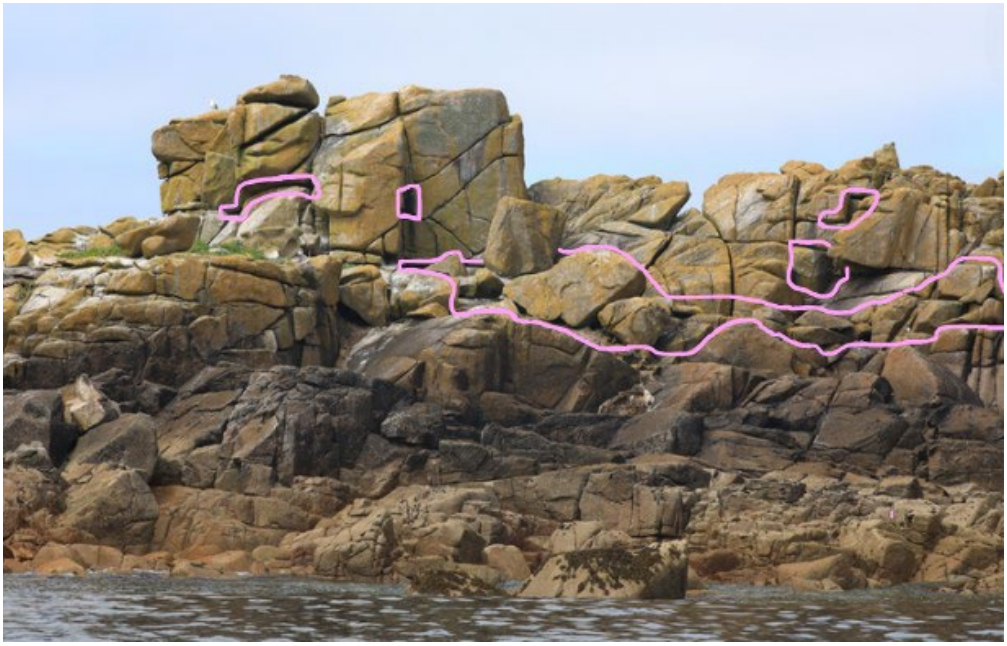


Figure 42. Suitable and unoccupied nesting habitat (shaded pink)

6.3.13. Puffin Island

6.3.13.1 Key features

Key observed features for Puffin Island are provided in Table 15 and an aerial image of the islet is shown in Figure 43.

Table 15. Key features: Puffin Island

Feature					
Map reference	31 (Table 1)				
Area	0.5 Ha				
Description	Grass and scrub vegetation, occasional boulders				
Maximum height above high tide mark.	8.5m				
Seabird count: Individual birds					
Survey	**Guillemot**	**Razorbill**	**Puffin**	**Other**	**Comment**
Heaney.H et al, IoS Wildlife Trust 2023	0	0	0	Herring Gull: 3 Great black-backed Gull: 1	
HAR, 24 - 26 June 2024	0	0	0	Low Activity: Gulls, Shag	

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 43. Aerial image Puffin Island

6.3.13.2 Habitat assessment

Selected images are shown in Figure 44.

Figure 44. Selected images showing seabird activity and islet habitat.

The assessment rates Puffin Island as Good for breeding guillemot and razorbill , including an estimated 44 sq. m of suitable and unoccupied boulder, ledge, and crevice habitat.

The study makes projections for two different scenarios for a mixed guillemot/ razorbill colony:

- A conservative 20 breeding pairs / sq. m nesting density (Harris and Birkhead, 1985) could accommodate an additional **880** pairs of breeding guillemot/razorbill.
- A healthy 46 breeding pairs / sq. m nesting density (Harris and Wanless, 1987) could accommodate an additional **2024** pairs of breeding guillemot/razorbill.

The locations of the unoccupied habitat are illustrated on selected photographs in Figure 45.

Credits: Esri UK, Esri, Earthstar Geographics, and Maxar. Contains OS data © Crown Copyright and database rights 2022.

Figure 45. Suitable and unoccupied nesting habitat (shaded pink)

7.0 Conclusions & recommendations

From the survey and assessment work carried out it can be concluded that:

- IoS North provides suitable and important habitat for breeding seabirds, including auks. In June 2024, HAR counted 152 individual guillemots and 349 individual razorbills. Guillemots and razorbills were largely observed nesting within boulder and crevice-type habitats.
- From discussion with both the IoS Wildlife Trust and Duchy of Cornwall, invasive predatory rats are known to be present across the island group and both landowner and leaseholder recognise the benefits of predator eradication for improving seabird populations.

There is unoccupied and suitable habitat space for additional breeding guillemot and razorbill, subject to improved environmental conditions, including removing rat predation pressure. The projections range from a conservative 24,296 through to a healthy 55,880 available and unoccupied additional nesting spaces across 13 islets rated as providing Good habitat for guillemot and razorbill. (Table 16). As this report details only island habitat rated Good, the projections likely represent an underestimate; currently excluding some 'pockets' of additional suitable habitat likely to be located within islands and islets rated as Moderate or Poor.

Table 16. Additional pairs of guillemot/razorbill that could be supported by unoccupied suitable Good habitat at different density assumptions.

Estimated area of unoccupied suitable habitat (ledges, boulders, and crevices > 2m above high tide plus splash zone) / sq. m	**Projected additional total pairs of guillemot / razorbill that could be supported by unoccupied suitable Good habitat**	
	Conservative Projection: Assume referenced 20 pairs / sq. m unoccupied habitat area **Pairs**	**Healthy Projection:** Assume referenced 46 pairs / sq. m x unoccupied habitat area **Pairs**
1,215	24,296	55,880

It is concluded that the IoS North would provide good candidate islands and islets to progress to a full-scale invasive predator eradication feasibility study. While rats are known to be present, it is unknown how abundant they are, how their population profile (DNA Haplotype) may vary across the group, or how resistant the rats may be to rodenticides (FGARs and SGARs). A pre-eradication feasibility study is recommended to answer these uncertainties.

Appendices

1. HAR Habitat assessment and nesting projections

Location	Map Reference	Habitat description	Available Habitat							Projection for fadditional numbers of pairs of guillemot and/or razorbill that could be supported by unoccupied habitat		Qualitative assessment of 2024 nesting activity	Qualitative RAG rating of the quality of the habitat to support additional nesting by target guillemot (and razorbill)	Qualitative RAG rating of the quality of the habitat to support additional nesting by non-target seabirds
			Approx. gradient	Approx. max height (m) above high tide minus 2m splash zone.	Estimated length of unoccupied rock ledges (approx. 0.3m depth) available for guillemot, and/or razorbill nesting.	Estimated area of unoccupied rock ledges (0.3m depth) available for guillemot, and/or razorbill nesting.	Estimated additional area of unoccupied boulder and crevice habitat (m2) available for guillemot, and/or razorbill nesting	Total area of unoccupied slopes/platforms/ crevices (m2) available for guillemot, and/or razorbill nesting	Assume 20 pairs per sq. m	Assume 46 pairs per sq. m			
Little Gannick	1	Boulders with grass and scrub	45 - 90%	10	0	0	76	76	1520	3496	Moderate Acitivity: - Razorbill High Activity: - Shags, LBBG	**GOOD** Good habitat for target guillemot	**GOOD** Good opportunity for razorbills and burrow nesting puffin, storm petrel and manx shearwater
Greater Gannick	2	Boulders with grass and scrub	45 - 90%	11.7	0	0	0	0	0	0	Moderate Acitivty: Mixed colony of lessor & greater black-backed gulls, herring gulls, shags Low Activity - Oyster Catcher	**POOR** Poor habitat for target guillemot	**GOOD** Good opportunity for razorbills and burrow nesting puffin, storm petrel and manx shearwater
Great Arthur	3	Boulders and Ledges with grass and scrub	45 - 90%	10.5	0	0	42	42	840	1932		**GOOD** Good habitat for target guillemot	**GOOD** Good opportunity for razorbills and burrow nesting puffin, storm petrel and manx shearwater
Little Arthur	4	Boulders with grass and scrub	45 - 90%			0		0	0	0	Low Activity: Mixed colony of lessor & greater black-backed gulls, herring gulls, shags, oyster catcher	**MODERATE** Moderate habitat due to low-lying boulders	**GOOD** Good opportunity for burrow nesting puffin
Little Ganilly	5	Grass and scrub, occasional boulders	45 - 90%	18		0		0	0	0	Low Activity: - Shags - Gulls	**POOR** Poor opportunity for target guillemot	**MODERATE** Opportunity for burrow nesting puffin. Poor opportunity for razorbill.

Menawethan	6	Cliffs (not a lot of lose boulder) with ocassional grass and scrub	45 - 90%	23	48	14.4	114	128.4	2568	5906	Low Activity: - Razorbill (4 in air, 3 AOT, 1 fledged chick) - Fulmar - Greater Black-Backed Gull w/ chick - Suspect Kitti Wake Pair - Perigrin Falcom - Oyster Catcher	**GOOD** Good habitat for target guillemot	**GOOD** Good opportunity for razorbill, fulmar and kittiwake*
Mouls	7.1	Bare Rock		6		0		0	0	0	Low Acitivty - Fulmar (2X AOT)	**MODERATE** Moderate habitat for target guillemot. But given the low height of the islet and its exposed location the rock ledges are considered highly vulnerable to being washed over during adverse weather conditions.	**MODERATE** Moderate opportunity for razorbill
Little Innesvouls	7.2	Inclined ledges with occasional grass and scrub		16		0		0	0	0	Moderate Activity: -Gulls - Shags	**GOOD** Good habitat for target guillemot	**GOOD** Good opportunity for razorbill
Great Innesvoulks	7.3	Boulders with occasional grass and scrub	45-90%	22		0	50.5	50.5	1010	2323	[illegible] - Razorbill (26 AOT) - Gulls - Shags Low Activity: - Fulmar	**GREAT** Good habitat for target guillemot	**GOOD** Good opportunity for razorbill
Great Ganilly and Nornour	8 and 9	Boulders with occasional grass and scrub		18		0	62	62	1240	2852	Low Activity: - Gulls - Shags - Fulmar - Oyster Catcher	**GREAT** Good habitat for target guillemot	**GOOD** Good opportunity for razorbill
Hanjague	10	Bare Rock		20		0		0	0	0	Low Activity: - Razorbill (1 AOT, 1 AOR) - Shags	**MODERATE** Exposed conditions, rock battered by pervailing winds	**MODERATE**
St Martins	11	Boulder, beach and regions of grass and scrub		18 - 35		0		0	0	0	Moderate Activity: - Fulmar (14 AOT) Low Activity - Greater Black-Backed Gulls - Oyster Catcher	**POOR** Suitable habitat but high presence of human activity negates any potential	**POOR**

White Island	12	Boulders, cliff ledges, ocassional grass and shrub		26		0		0	0	0	Low Activity - Guillemot (1 flying) - Gulls	**MODERATE** Great habitat for guillemot with location protected by pervailing winds. However attached to St Martins at low tide, so would need to eradicate on St Martins before rating could be improved to GOOD.	**MODERATE**
Pernagie	13	Boulders, lose rock with ocassional grass and shrubs		N/A		0		0	0	0	Low Activity: - Shags	**POOR** Low lying, little abundant nesting space	**POOR**
Lion Rock	14	Bare Rock				0		0	0	0	N/A	**POOR** Poor habitat for target guillemot**.** Given the low height of the islet and its exposed location the rock ledges are considered highly vulnerable to being washed over during adverse weather conditions.	**POOR**
Round Island	15	Boulders and ledges with occasional grass and shrub		26		6.5	192	198.5	3970	9131	Low Activity: - Fulmar - Shags - Gulls Evidence of nesting: - Manx Shearwater (green strip of vegetation)	**GOOD** Good location however very exposed to the winds	**GOOD** Good potential for razorbill
St Helen's	16	Grass and scrub with pebble beaches. Occasional boulders		30		0		0	0	0	N/A	**POOR** Poor habitat for target guillemots due to grassy terrain	**GOOD** Good potential habitat for puffin, petral and manx shearwater
Men-a-vour	17a	Exposed rock with cliff edges and boulders		0	8	2.4	193	195.4	3908	8988	Moderate Activity: - Guillemot (62 AOT) Low Activity: - Razorbills (9 AOT) - Puffin (3 on island, 1 rafting)	**GOOD** Good habitat for target guillemot, although very exposed to winds	**GOOD** Good habitat for razobrill and manx shearwater
	17b	Exposed rock with cliff edges and boulders		31		0		0	0	0		**GOOD** Good habitat for target guillemot	**GOOD** Good habitat for razobrill and manx shearwater

	17c	Exposed rock with cliff edges and boulders		28		0		0	0	0	High Activity: - Guillemot (103 AOT, 200+ rafting) Moderate Activity: - Razorbill (2 AOT, 20 rafting) Low Activity: - Shag	**GOOD** Good habitat for target guillemot. This section is protected from winds.	**GOOD** Good habitat for razobrill and manx shearwater
Northwethal	18	Grasses and boulder		13		0		0	0	0	N/A	**MODERATE** Grassy with minimal boulder/cliff space	**GOOD** Good habitat for razorbill
Kettle Point	19	Boulders and Ledges		28		0		0	0	0	No activity	**MODERATE** Good habitat for guillemot but high tourist activity and in close proximity to boats. The latter half negating the potential for nesting space.	**MODERATE** Due to human traffic
Shipmans Head	20a	Boulders and cliff ledges		30	0	0	0	123	2460	5658	Low Activity: - Razorbill (9 AON, 7 rafting) - Gulls - Oyster Cartcher - Fulmas (1 AOT) - Shag	**GOOD** Good potential habitat for guillemot, sheltered from winds. Rat presence here confirmed.	**GOOD** Potential habitat for razorbill
Shipmand Head	20b	Boulders and legdes with grassy patches				0		0	0	0		**MODERATE** Good potential habitat but very exposed to widns	**GOOD** Good potenital nesting space for puffins, manx shearwater and petral
Tresco	21a					0		0	0	0	No activity	**POOR** Good habitat but in close proximity to slipway.	**POOR**
	21b	Beach						0	0	0	No activity	**POOR**	**POOR**
	21c	Boulders						0	0	0	No activity	**POOR** Good habitat but in close proximity to slipway	**POOR**

Tide Rock (islet)	21aa	Exposed rock		2.7				0	0	0	Low Activity: - Oyster Cartcher	**POOR** Bare rock washed over at high tide	**POOR**
Peahopper Island (islet)	21bb	Exposed Rock		3				0	0	0	Low Activity: - Shags	**MODERATE** Moderate boulder space for guillemot with no direct paths to other island/islets. Infested by invasive weeds.	**MODERATE**
Foremans Island	21cc	Boulders with grass and scrub		N/A				0	0	0	Low Activity - Lesser & Greater Black Backed Gulls	**MODERATE**	**MODERATE**
Crows Island	21dd	Low lying boulder with ocassional scrub		N/A				0	0	0	Low Activity: - Gulls - Shags	**MODERATE**	**MODERATE**
Scilly Rock	22a	Exposed rock with cliff edges and boulders		16			66	66	1320	3036	Moderate Activity - Guillemot (AOT and rafting) Puffins (100+ nesting. Not obvious where puffins are nesting but flying off of ledges.) - Razorbill (AOT and rafting)	**GOOD** Good habitat for guillemot, rats unlikely. From survey, understand that there is a lot of hidden territory as such estimates don't reflect true amount. Recommend drone survey.	**GOOD**
Scilly Rock	22b	Exposed rock with cliff edges and boulders		16				0	0	0	No Activity	**POOR** Too exposed	**POOR**
Gweal	23			30				50	1000	2300	Moderate Activity: - Razorbill (+/- 70 loafing)	**GOOD** Good potential habitat for guillemot with rocky crevices protected by high outcrop. Rats likely.	**GOOD** Suspect evidence of Manx Shearwater with green, grassy bank.
Maiden Bower	24	Exposed rock with occasional boulder		17				0	0	0	Low Activity: - Oyster Catcher - Gulls	**MODERATE** Moderate habitat for guillemot. Rats unlikely.	**GOOD**

Seal Rock	25	Exposed rock		4				0	0	0	No activity	**POOR** Poor opportunity for target guillemot. Low lying, easily washed over.	**POOR**
Mincarlo	26	Boulders with ocasssional grass		25			159	159	3180	7314	<u>Moderate Activity</u> - Razorbill (6 loafing, with moderate numbers flying out of unknown location)	**GOOD** Good potential habitat for guillemot. Currents strong in channel surrounding island, creating difficulty for rats swimming to islet	**GOOD** Good potential habitat for razorbill. Moderate habitat potetnial for burrow nesting puffin.
		Boulders, crevices, ledges with occasional grassy path		25				0	0	0	<u>Moderate Acivity</u> - Mixed Auk Colony (guillemot, razorbill, puffin) >150 AON, 75 rafting.	**GOOD** Great potential habitat for guillemot especially on East Face as it is sheltered from winds	**GOOD** Good potential habitat for razorbill. Moderate habitat potetnial for burrow nesting puffin.
Illiwilig	27	Boulders, ocassional scrub		16			20	20	400	920	<u>Low Activity:</u> - Auks (5 AON) - Gulls - Shags	**GOOD** Good habitat for target guillemot with sheltered conditions on Eastern Face	**GOOD** Good potential habitat for razorbill.
Castle Bryher	28	Boulders with occasional grass and scrub		23				0	0	0	<u>Low Activity:</u> - Lessor Black Backed Gull (1 loafing) - Shag - Roazrbill - 1	**MODERATE** Moderate habitat for guillemot as islet is small with moderate crevices for nesting	**MODERATE**
White Island	29	Pebble beaches with low, lose boulders		4				0	0	0	<u>High Activity:</u> - Gulls - Shags	**POOR** Poor habitat potential for nesting guillemot due to low height and lack of crevices	**POOR**
Samson	30	Grass and scrub with some lose rock and low-lying pebbles.		N/A				0	0	0	<u>Low Activity:</u> - Gulls - Shags	**POOR** Poor potential habitat for guillemot	**GOOD** Good potential habitat for burrow nesting puffin and manx shearwater

Puffin Island	31	Occasional boulder locations		8.5				44	880	2024	Moderate Activity - Shags - Gulls	**GOOD** Good potential for guillemot with 2-3 boulder locations	**GOOD** Good potential habitat for razorbill
Guthers	32		45 - 90%	9		0		0	0	0	Low Activity: - Gulls - Shags	**MODERATE** Rats likely. Moderate potential habitat for guillemot with a few ledges. However islet is exposed to weather.	**MODERATE**
Tean	33	Grassy, low lying with occasional boulder		8				0	0	0	N/A	**POOR** Poor potential habitat for guillemot. Low lying so likley to get washed over.	**MODERATE** Moderate potential habitat for razorbill
Bryher	34									0			

Totals 'Good Habitat' for mixed guillemot and razorbill colony	**Area**	**Assume 20 pairs/sqm**	**Assumes 46 pairs/ sqm**
	1215	**24296**	**55881**