

A Census Of The Northern Gannet Population On Grassholm 2023

Report No: 744

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Crynodeb Gweithredol

Arolygwyd nythfa Ynys Gwales gan yr RSPB gan ddefnyddio drôn ym mis Mehefin 2023. Datgelodd yr arolwg ostyngiad o 52%, sef gostyngiad o **34,491** o 'safleoedd sy'n cael eu meddiannu yn ôl pob tebyg' yn 2022 i lawr i **16,482** o safleoedd o'r fath yn 2023. Mae'r gostyngiad hwn o ganlyniad i farwolaethau nifer fawr o huganod yn haf 2022 yn sgil ffliw adar.

Executive summary

The colony of Grassholm was surveyed by drone, by RSPB in June 2023. The survey revealed a 52% decline from **34,491** AOS (Apparently Occupied sites) in 2022 to **16,482** AOS in 2023. This decline is due to the massive mortality of gannets in the summer of 2022 due to avian flu.

Background

The Northern Gannet population on Grassholm has historically been one of the largest in the world for this species. The population was first estimated in 1872 when 12 pairs were recorded. Population estimates occurred regularly after that and since 1986 has been censused every five years. In 2015 the population was estimated at 36,011 Apparently Occupied Sites (AOS) – this was conducted using a fixed wing aeroplane to capture images. This figure accounted for just under 10% of the world population.

In 2022 methodology was changed to use a drone to capture imagery. Counting was carried out manually using the 'count function' on Adobe Photoshop.

The 2022 census was carried out a month before an outbreak of Highly Pathogenic Avan Influenza (HPAI) and resulted in a population estimate of 34,491 AOS. This should not necessarily be seen as a real decline from the 2015 census as it was felt the overhead angle the drone allowed offered a more accurate picture of the colony. In addition, the counters were familiar with the areas where non breeders congregate and there were low numbers of non breeders on site in 2022 to complicate matters (a factor which may have skewed some of the previous counts carried out by contractors unfamiliar with the site).

Following the HPAI outbreak in 2022, funding was granted by NRW to carry out a repeat drone survey in 2023. The same methodology was used with two of the three counters the same persons as in 2022.



The 2023 population estimate was **16,482 AOS**. This represented a 52% decline on 2022 and the lowest the population has been since 1969.

Figure 1: Northern Gannet population trend on Grassholm 1872-2023

Methodology

On 20th June RSPB staff travelled to Grassholm on the Blue Shark, a vessel in the Thousands Islands Expeditions fleet and landed via small RIB transfer. All persons were wearing full HPAI PPE (hazmat suits, rubber boots, eye protection, nitrile gloves and face masks). There was no sign of HPAI at the time of landing.

The drone operator, Richard Humpidge (RSPB Site Manger Grampian) was using a DJI Mavic 2 Pro and flew over the colony at a height of 60m (91m above sea level). The drone flew a series of parallel transects with 75% overlap between photos along each transect and between transects.

'Maps made easy' software was used for flight management and 'drone2map' to produce the final image used for counting.

This image was then shared with fellow authors, Greg Morgan (RSPB Site Manager for Ramsey and Grassholm) and Nia Stephens (RSPB Warden for Ramsey and Grassholm) and all three authors conducted a manual count using the 'count function' in Adobe Photoshop. The count unit used was Apparently Occupied Sites (AOS).

Only birds sitting in an 'apparently incubating' position were included in the count. Any birds standing around in the colony were discounted, along with any obvious non breeders occupying sites, plus all known non breeding club sites. If two birds were present on one nest site (an obvious pair), this was counted as a single site. This count methodology has been used in all previous surveys.



Figure 2: Drone transect flight lines

Results

The three individual counts were:

GM – 16,514 AOS NS – 16,536 AOS RH – 16,396 AOS

Average – 16,482 AOS

Summary Of Key Results

16,482 AOS is a significant decline of 52% on the 2022 census of 34,491 AOS and as a direct result of the impact of the 2022 HPAI outbreak. The disease was first detected on the island in July 2022 and by early September it was clear it was having a significant impact. Many thousands of birds were witnessed dying on site or washing in on nearby beaches. It is now clear many more must have washed out to sea undetected.

The last time the population was at this level was 1969. Even without further HPAI outbreaks, or any other population level threats, it could be over 50 years before the colony returns to pre HPAI levels, if indeed if does.

Conclusions And Recommendations

Grassholm supported one of the largest populations of Northern Gannet in the world prior to 2022, holding internationally important numbers. In a single year HPAI reduced the population by over 50%. Most Gannet colonies around the UK are also reporting declines but no figures are available at the time of writing. A colony off northern France (Fou de Bassin de Roizic dans Les Sept-Îles) has seen a similar population decrease to Grassholm in 2023 (pers comm.)

In 2023 HPAI was again recorded on Grassholm but at apparently lower levels. Small numbers of dead/dying birds were detected from July onwards, and a positive HPAI result was obtained from one sample, but we won't know the true impact of two consecutive seasons with the disease present until the 2024 census is completed. A crude estimate revealed around 10% of birds showed 'black eyes', a sign that an individual had contracted and recovered from HPAI (Lane et al 2023) and therefore possibly has a degree of immunity. However it is now known that the strain of virus that was dominant in 2023 was a new genotype compared with the one that caused the previous mortalities in 2022, (various web references – see below) with gulls, terns and later Guillemots being the most affected species this year.

Such a dramatic decline in the population at Grassholm puts the colony at enhanced risk from other potential threats and pressures such as climate change, windfarms and fisheries. It is recommended that this census is conducted annually for a number of years to be able to understand the longer term impact of the 2022 mortality as well as future outbreaks of HPAI.

The RSPB would like to thank NRW for its financial support towards the 2023 census and commitment to future monitoring.

FIGURES



Figure 3: Whole Island aerial of Grassholm 2023 (16,482 AOS) – large gaps and reduced density can be seen (use zoom function to see more clearly) © RSPB Cymru



Figure 4: Comparison between central colony in 2022 (top) with same area in 2023 (bottom) – reduction in density is notable with many empty nests visible \odot RSPB Cymru

TABLES

YEAR	AOS	Source
1872	12	Davis 1890
1883	20	Fisher & Vevers 1943
1886	250	Fisher & Vevers 1943
1890	200	Fisher & Vevers 1943
1889	225	Fisher & Vevers 1943
1893	240	Fisher & Vevers 1943
1905	300	Fisher & Vevers 1943
1922	900	Fisher & Vevers 1943
1924	1800	Fisher & Vevers 1943
1933	4750	Fisher & Vevers 1943
1937	5000	Unknown
1939	6000	Unknown
1946	6000	Buxton & Lockley 1946
1948	7000	Pitt 1947
1949	9200	Fisher & Lockley 1954
1956	10550	Lockley 1956
1964	15500	JNCC
1969	16128	JNCC
1977	20000	Watson 1977
1984	28545	JNCC

1986	30000	JNCC
1991	26000	JNCC
1994	26277	JNCC
1999	30688	JNCC
2001	31000	Field 2001
2004	32094	JNCC
2009	39292	Murray 2009
2015	36011	Murray 2015
2022	34491	Morgan & Humpidge 2022
2023	16482	Morgan, Stephens & Humpidge 2023

Table 1: Northern Gannet population trend on Grassholm 1872-2023

References

Reference Type	Correct Format
Journal	Lane et al. (2023) High pathogenicity avian influenza (H5N1) in Northern Gannets: Global spread, clinical signs, and demographic consequences (in press IBIS) Votier, S.C., et al. (2010) The use of plastic debris as nesting material by a colonial seabird and associated
	entanglement mortality. Mar. Pollut. Bull
Web pages/sites and e-	<u>Avian influenza overview December 2022 – March 2023</u> (wiley.com)
books	Investigating the genetic diversity of H5 avian influenza in the UK 2020-2022 bioRxiv

Appendices

Data Archive Appendix

Data outputs associated with this project are archived in [NRW to enter relevant corporate store and / or reference numbers] on server–based storage at Natural Resources Wales.

Or

No data outputs were produced as part of this project.

The data archive contains: [Delete and / or add to A-E as appropriate. A full list of data layers can be documented if required]

[A] The final report in Microsoft Word and Adobe PDF formats.

[B] A full set of maps produced in JPEG format.

[C] A series of GIS layers on which the maps in the report are based with a series of word documents detailing the data processing and structure of the GIS layers

[D] A set of raster files in ESRI and ASCII grid formats.

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[F] A full set of images produced in [jpg/tiff] format.

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