



# Condition assessment for the designated feature of Ardal Gwarchodaeth Arbennig Ynys Gwales / Grassholm Special Protection Area

Report No: 916

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Northern gannet Morus bassanus. Copyright © Jenny Elliott, all rights reserved.

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# **Crynodeb Gweithredol**

Er mwyn rheoli ein hardaloedd morol gwarchodedig yn effeithiol ac yn gynaliadwy, mae'n hanfodol deall cyflwr eu cynefinoedd a'u rhywogaethau gwarchodedig. Mae gwybod cyflwr nodweddion dynodedig yn caniatáu i ni dargedu rheolaeth ac adnoddau lle mae eu hangen i wella ac adfer cyflwr.

Mae'r adroddiad tystiolaeth hwn, a gyflwynwyd fel rhan o brosiect gwella cyngor cadwraeth forol (IMCA) a ariannwyd gan Lywodraeth Cymru, yn cyflwyno canfyddiadau asesiadau cyflwr Cyfoeth Naturiol Cymru ar gyfer ardal gwarchodaeth arbennig (AGA) Ynys Gwales. Mae adran un yn rhoi trosolwg o'r broses asesu ac mae adran dau yn rhoi disgrifiad o'r AGA a'i nodweddion.

Mae'r asesiadau'n seiliedig ar y dystiolaeth orau a oedd ar gael ar y pryd (e.e. 2024). Adroddir canlyniadau asesiadau gyda hyder cysylltiedig yn y casgliad. Gellir dod o hyd i esboniadau manwl o'r rhesymeg y tu ôl i gasgliadau, ac unrhyw resymau dros fethu, yn yr asesiad cyflwr llawn yn Adran 3. Gellir dod o hyd i adroddiad ar y broses asesu a ddefnyddiwyd yn adroddiad terfynol IMCA.

Crynodeb o asesiadau cyflwr ar gyfer nodweddion dynodedig AGA Ynys Gwales.

Nodweddion Dynodedig	Asesiad cyflwr	Hyder yn yr asesiad	
Hugan <i>Morus bassanus</i>	Anffafriol	Uchel	

## **Executive summary**

To manage our marine protected areas effectively and sustainably it is vital to understand the condition of their protected habitats and species. Knowing the condition of designated features allows management and resources to be targeted where it is needed to improve and restore condition.

This evidence report, which was delivered as part of the Welsh Government funded improving marine conservation advice (IMCA) project, presents the findings of NRW's condition assessments for the features of Grassholm SPA. Section 1 gives an overview of the assessment process and Section 2 provides a description of the features.

The assessments are based on the best evidence available at the time (e.g. 2024). Assessment outcomes are reported with an associated confidence in the conclusion. Detailed explanations of the rationale behind conclusions, and any reasons for failure, can be found in the full condition assessment in Section 3. A report on the assessment process used can be found in the <u>IMCA final report</u>.

#### Summary of condition assessments for the designated features of Grassholm SPA.

Designated Features	Condition assessment	Confidence in assessment	
Northern gannet Morus bassanus	Unfavourable	High	

# 1. Introduction

It is important for NRW to understand the condition of designated features in marine protected areas (MPAs) to allow NRW to prioritise management actions and advise on activity in the marine environment.

Having robust, evidence-based assessments of feature condition will ultimately lead to better protection through better management. The improvements in condition brought about by implementing targeted management will ultimately improve the resilience of Wales' marine ecosystems. As MPAs in Wales cover extensive areas of sea and coast, it can be challenging and resource intensive to monitor them. This can make thorough assessments of feature condition difficult. The process used for these condition assessments builds on work undertaken to produce <u>indicative condition assessments</u> published in 2018.

The 2018 indicative assessments used all available data and expert judgement to assess features using a workshop approach with internal NRW specialists. The new full assessment process, which has been delivered through the Welsh Government funded improving marine conservation advice (IMCA) project, has been improved by using carefully chosen performance indicators judged to be the most appropriate to assess condition (see section 3). The best available evidence has been used to conduct the assessments. Due to the differences in assessment methods between these full assessments and the indicative condition assessments, the results are not directly comparable.

## **1.1. Assessment process**

Marine feature condition assessments in NRW consist of selecting performance indicators for the feature, gathering the best available evidence to assess those indicators and conducting the assessment.

Performance indicators have targets which have a primary, secondary or tertiary weighting. Failure of a primary target will mean the feature is classified as unfavourable, on a 'one out all out' basis. If all primary targets pass but two secondary targets fail, the feature would also be classified as unfavourable. Likewise, if all primary and secondary targets pass but three tertiary targets fail, the feature will also be unfavourable. Condition assessment outcomes are not strictly determined by target weightings and are also subject to expert judgement.

Each indicator result has an associated confidence which is determined by the quality and age of the evidence along with the confidence in the indicator itself and what it is telling us about condition of the feature. The confidence in the overall assessment is derived from the confidence in each target pass or failure, as well as expert judgment/ assessor consensus.

Each feature condition assessment will also identify reasons for indicator failure where known and any known threats to feature condition.

Table 1 summarises the steps taken in marine feature condition assessments. Details on the full condition assessment process, including indicator selection and target weighting can be found in the <u>IMCA final report</u>.

Assessment Step	Process		
Step 1: Preparation and evidence gathering.	Prepare site information. Source relevant evidence and any previous assessments. Evaluate quality of evidence according to suitability for use in assessments and carry out any analysis required.		
Step 2: Indicator assessment.	A range of NRW specialists use all available evidence to assess the performance indicators and targets using a pass, fail or unknown. Record findings in the condition assessment form. Provide a confidence score for each target conclusion.		
Step 3: Feature level assessments.	Combining the results from the assessment of feature indicators to provide an overall assessment of condition at the feature level.		
Step 3.5. Complex features.	If the feature is a complex feature (i.e., estuaries or large shallow inlets and bays) consider the results of any nested feature assessments within the overall complex feature assessment.		
Step 4: Condition pressures and threats.	Use the evidence gathered and information on management and activities to determine threats and pressures on feature condition.		
Step 5: Finalise the assessments.	Ensure all required fields in the assessment have been completed and all assessed targets have an associated confidence. Circulate the reports to the relevant NRW specialists for review and comment. After issues have been resolved, the assessments will be signed off by the project task and finish group.		
Step 6: Publish the assessments.	After signing off, the assessments will be published on the NRW website, and stakeholders and internal staff notified. Assessments are then ready to use by internal and external parties.		

# 2. Site description

The ardal gwarchodaeth arbennig Ynys Gwales / Grassholm special protection area (SPA) is a low-lying basalt island, situated approximately 18km off the south-west Wales coast. The island has limited terrestrial vegetation owing to the effects of the substantial number of breeding seabirds and the influence of salt spray and exposure, and its foreshore and sublittoral habitats are amongst the most wave and tide-exposed in Britain. From January to October Grassholm island supports a breeding population of the northern gannet *Morus bassanus* (abbreviated to gannet). The SPA covers an area of approximately 1744 ha.

The first account of gannets occupying the island comes in the late 1800s with a record of up to 20 gannet nests in 1860 and anecdotal accounts of their presence as early as 1820. The SPA was classified in 1986 to include the whole of the island of Grassholm and several small islets and rocks, down to the mean low water mark. In 2014 the site was extended to include adjacent sea areas that are used by birds from within the existing SPA for behaviours that are directly linked to their use of the breeding site. The site was extended to include a 2 km radius around the island from the original SPA seaward boundary (mean low water mark). Gannets use the marine waters immediately adjacent to the colony for several essential activities, such as preening, bathing and displaying. The nesting seabirds using the site also feed both within and outside the SPA in surrounding marine areas, as well as more distantly.

The site qualifies under article 4.2 of the Conservation of Wild Birds Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical population of the following regularly occurring migratory species (other than those listed in Annex I) in any season: gannet *M. bassanus*. The population at designation was estimated to be 33,000 pairs in the breeding season (count as at 1994/95). This equated to 12.5% of the breeding North Atlantic population.

The SPA is overlapped by the Pembrokeshire Marine SAC and West Wales Marine SAC and is adjacent to the Skomer, Skokholm and Seas off Pembrokeshire SPA. It also overlaps with the Grassholm Site of Special Scientific Interest (SSSI).

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## 3. Feature condition assessments

The condition assessment for Northern gannet was based direct monitoring of the site and on the expert knowledge and judgement of NRW staff.

Figure 1 is a map of the location of Grassholm SPA.

More information on the SPA and its feature can be found in NRW's conservation advice for the site on our <u>website</u>.

Figure 1	۱.	Map	of	the	Grassholm	SPA.
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## 3.1 Condition assessment for gannet *Morus bassanus*

Gannet in the Grassholm SPA has been assessed in Table 2. The table has a summary of the assessment outcome against each performance indicator. This outcome and reasons of failure are discussed in more detail in the sections below

**Table 2.** Condition assessment of gannet in the Grassholm SPA. Each indicator target has a primary (P), secondary (S) or tertiary (T) weighting (see section 1.1).

Indicator	Target	Assessment rationale	Target assessment	Target confidence
Breeding population	Maintain the breeding gannet population at or above 33,000 pairs. (P)	• The breeding population fell from 34,492 apparently occupied sites (AOS) in 2022 to 16,482 AOS in 2023. This was due to an outbreak of the Highly Pathogenic Avian Influenza (HPAI) virus (also know as avian flu) in 2022 (after the population survey in June 2022).	Fail	High
		<ul> <li>Breeding birds had recovered slightly in 2024 to 19,199 AOS but this is still well below the target of 33,000 pairs.</li> <li>The confidence in the fail is high due to the</li> </ul>		
		numbers being substantially below the target.		
Breeding population distribution distribution The distribution of the breeding northern gannet population should not be significantly impacted by anthropogenic activity. (P)	<ul> <li>There are currently no anthropogenic activities known to impact the distribution of breeding northern gannets across the SAC.</li> </ul>	Pass	Medium	
	should not be significantly impacted by anthropogenic activity. (P)	<ul> <li>Although breeding pairs in 2023 were 52% lower than in 2022 they were widely distributed across the site.</li> </ul>		
		<ul> <li>The confidence is medium as the assessment is based on expert judgement.</li> </ul>		

Indicator	Target	Assessment rationale	Target assessment	Target confidence
Population disturbance (by human activity)	Aggregations of breeding, roosting or feeding northern gannet are not subject to significant anthropogenic disturbance. (P)	<ul> <li>Grassholm is a remote site and there is currently no evidence of human activity derived disturbance.</li> <li>The royal society for the protection for birds (RSPB), who own and manage the island part of the SPA, maintain a no landing policy and they liaise with, and assist, local boat operators who run trips around the island to minimise disturbance to the colony and the surrounding waters. Therefore the confidence in the pass is high.</li> </ul>	Pass	High
Supporting habitat	Maintain sufficient extent, distribution, function and quality of habitat to support a gannet population of 33,000 breeding pairs. (S)	<ul> <li>This aspect is not directly monitored. However, no reduction in habitat quality has been reported.</li> <li>However the high numbers of gannets present before the outbreak of avian flu indicates that the supporting habitat is sufficient to support a large number of birds.</li> <li>As this is not directly monitored and is based on expert judgement the confidence in the assessment is medium.</li> </ul>	Pass	Medium

Indicator	Target	Assessment rationale	Target assessment	Target confidence
Prey availability	Maintain the distribution and abundance of northern gannet prey at levels sufficient to support a population of 33,000 breeding pairs. (S)	<ul> <li>Prey availability for the population is not directly monitored.</li> <li>The high numbers of gannets present before the outbreak of avian flu indicates that the food availability is sufficient to support a large number of birds.</li> <li>As this is not directly monitored and is based on expert judgement the confidence in the assessment is medium.</li> </ul>	Pass	Medium
Invasive species	No invasive species not native to the islands of the SPA should be present. (S)	<ul> <li>There are currently no known invasive species not native to the island present and biosecurity measures are in place to prevent harmful mammals reaching this island.</li> <li>The presence of a no landing policy on the island since 1987 has helped to ensure the island stays mammalian predator free. Therefore the confidence in the pass is high.</li> </ul>	Pass	High

### **Assessment conclusions**

Gannet in Grassholm SPA have been assessed as being in unfavourable condition (high confidence). One primary indicator, breeding population, failed to meet its target (Table 3). The main threats to the gannet colony at Grassholm come from further outbreaks of the HPAI virus and predation by predatory non-native mammals. Further information on the assessment outcome and threats to condition can be seen in the detailed assessment information below.

**Table 3.** Summary of the condition assessment for gannet in Grassholm SPA. Each indicator target has a primary (P), secondary (S) or tertiary (T) weighting.

SPA Feature Overall Condition Assessment		Indicator failures	Reason for indicator failure	Threats to condition	
Northern gannet <i>Morus bassanus</i>	Unfavourable (high confidence)	Breeding population (P)	Highly Pathogenic Avian Influenza (HPAI) virus	<ul><li>Disease</li><li>Disturbance</li><li>Invasive species</li><li>Climate change</li></ul>	

### **Detailed assessment information**

#### **Breeding population**

The northern gannet population on Grassholm has historically been one of the largest in the world. Population estimates have been taken every five years since 1986. Surveys since the 1960s were carried out using a fixed wing aeroplane, until 2022 when a drone was used for the first time.

Grassholm is a remote site and difficult to monitor which is why monitoring has been carried out from the air since the 1960s. The term "apparently occupied sites" (AOS) is used to mean a nest site capable of holding a breeding pair with at least one bird present and sat in the incubation position. This is used as a proxy in the assessment for a pair of birds. In June 2022 the population was estimated as 34,491 AOS, accounting for approximately 10% of the world's population of gannets.

A month after the June 2022 survey the colony was hit by a significant outbreak of Highly Pathogenic Avian Influenza (HPAI) (avian flu). This resulted in a 52% decrease in the breeding population to 16,482 AOS in June 2023 (Morgan et al., 2023). Although there was a small increase seen in 2024 to 19,199 AOS the population is still very low (below the target level of 33,000 pairs). Productivity at the site has also shown a decline but this is likely to increase again over the next few years. It may take the colony many years to reach the target of 33,000 pairs again.

Figure 2 shows the gannet population trend on Grassholm from 1872 to 2024. Figure 3 shows aerial views of the central colony in June 2022 before avian flu struck, when the colony was estimated to be in excess of 34,000 breeding pairs. Figure 4 shows the same aerial view in 2023 where large areas of nest abandonment can clearly be seen. The large reduction in population to numbers below the target level meant the breeding population indicator failed to meet its target with high confidence.

Gannets reach maturity between the ages of four and five. They begin breeding between late February and April. The females lay a single egg and the parents share incubation duties for six weeks. Chicks normally hatch in early June and the chicks fledge in late August and throughout September (Vulcano, 2021).

Productivity was calculated from the ground following the standard method used on Grassholm for over 20 years. This involves a single visit in late July / early August and an assessment of 500-1000 nests. The number of chicks compared to empty nests are counted and the number of large chicks (likely to fledge) is divided by the total number of nests observed. The number of chicks likely to progress to fledging age was low in 2023 at 44% of monitored nests, and even lower in 2024 at 26%, the lowest in record. One of the reasons for this may have been due to the high levels of predation by gulls which have increased access to birds deeper within the colony due to the large gaps that now exist. Another reason could be the immaturity of new breeders that have come into the gaps in the colony, meaning that they are less successful at raising chicks than the previous mature adult pairs that died in the avian flu outbreak (Morgan et. al., 2023).

**Figure 2.** The trend of the gannet population on Grassholm from 1872 to 2023 (Morgan et al., 2023).



**Figure 3.** Central colony on Grassholm in June 2022 showing evenly spaced nesting birds.



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**Figure 4.** Central colony on Grassholm in June 2023 showing large gaps in the nesting population.



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#### **Breeding population distribution**

Although gannet numbers were severely reduced after the avian flu outbreak, there is currently no anthropogenic activity known to impact the distribution of breeding northern gannet across the SAC. Breeding pairs in 2023 were 52% lower than in 2022, however they were widely distributed across the site (RSPB, 2023). The gannets present had full use of the whole colony and there was nothing present preventing access to the nesting sites. The indicator passed with medium confidence as the assessment was based on expert judgement.

### **Population disturbance**

Disturbance occurs when an activity is sufficient to disrupt normal behaviours, for example, changes to feeding or roosting behaviour, increased energy expenditure due to time spent moving to avoid stressors, desertion of supporting habitats (both within and outside the protected area where appropriate). If the activity occurs at a level that substantially impacts behaviour for long enough it can lead to changes in distribution, displacement through reduction of habitat available and consequently could affect the long-term viability of the population. Disturbance associated with human activity may take a variety of forms including, light, sound, vibration, trampling, presence of people, animals and structures.

Although a tourist attraction, human disturbance from visitors has been significantly reduced since landings on the island by the public were stopped in 1997. The RSPB continue to protect the nesting gannets by maintaining a no landing policy on the island. Tourist boats now circumnavigate the island, and there is a code of conduct agreed with tourist boat operators to minimise disturbance from the sea. The RSPB continue to liaise

with, and assist, local boat operators who run trips around the island to minimise disturbance to the colony. There is still the potential for private boats to cause disturbance, although the remote nature of the island tends to deter most visitors. For this reason, and as the colony was thriving until the outbreak of the avian flu, it was assessed as being not subject to significant anthropogenic disturbance. The population disturbance (by human activity) indicator therefore met its target with high confidence.

### Supporting habitat

The extent, distribution and availability of suitable habitat (either within or outside the site boundary) which supports the feature for all necessary stages of the breeding period (displaying, nesting, roosting, feeding) is important to the condition of the gannets using the site. Although not directly monitored, they are wide ranging foragers, capable of travelling 1000s of km on a single foraging trip, though breeders do not range as far, travelling up to 500km to locate and obtain food for themselves and their young (Votier et al., 2017). Figure 5 details this from gannet colonies across the UK (Wakefield et al., 2013). Grassholm island and the seas used by the birds for foraging are able to support large numbers of gannets, as could be seen by the population of 34,000 pairs recorded in June 2022 (RSPB, 2023), before the avian flu impacted the population. There is no reason to believe that the supporting habitat is limited or has reduced. The large gannet population pre-HPAI strongly suggests the habitat is of suitable quality to support the population, therefore the supporting habitat indicator was assessed as passing its target. However, as the supporting habitat is not directly monitored and the assessment was based on expert judgement, the confidence in the pass was reduced to medium.

**Figure 5**. Maps showing presence of colonies (A) and GPS tracks collected on birds from the colonies (B) (Wakefield et al, 2013).



### Prey availability

Gannets are generalist predators known to take a wide range of prey species and sizes. During the breeding season, gannets feed primarily on lipid-rich pelagic shoaling fish, such as mackerel *Scomber scombrus* and sandeels (mainly *Ammodytes marinus*) (Hamer et al., 2007). They often perform dramatic plunge dives from high in the sky to catch fish up to depths of 20m and can stay submerged for over half a minute.

They also feed from the surface on small shoaling fish and on discards from fishing vessels, where their large size helps them out-compete most other scavenging species. As with supporting habitat, prey availability is not directly measured. The large gannet population pre-HPAI strongly suggests prey availability is enough to support the population. There is no reason to believe that prey is limited or has reduced since. The prey availability indicator therefore met its target. However, as there are no targeted surveys for food availability and the assessment was based on expert judgement, the confidence in the pass was reduced to medium.

#### **Invasive species**

The RSPB has produced and adopted a comprehensive biosecurity plan for Grassholm, which sets out adequate monitoring for predatory invasive mammals on the island as well as a plan for dealing with an incursion if this does take place. Grassholm is a difficult reserve to access given its remote location, and the RSPB have maintained a no landing policy since 1987. In a normal season RSPB staff would only land on the island periodically during summer months (July and August) for research purposes. So far this has protected the island from predatory mammals that would prey on bird eggs. At present, ground predators, such as common rat, do not inhabit the island. The invasive species indicator therefore passed with high confidence. Should such predators be introduced they could severely threaten the gannet population. All measures must be taken to avoid their introduction.

### **Reasons for target failure**

The assessment of the gannet feature in the Grassholm SPA failed one primary target. This resulted in the feature to be assessed as being in **unfavourable** condition. The failing indicator and reasons for failure, if known, are stated below.

#### **Breeding population**

The breeding population performance indicator failed to meet its primary target due to the large reduction in the numbers of gannets at the colony after the mortality due to the HPAI virus in the summer of 2022. This reduction in numbers had a knock-on effect on the distribution and lowered the productivity of the gannet colony.

### Threats to condition

Part of the condition assessment is to identify threats to the condition of the gannet feature on Grassholm SPA. A threat is defined as an activity that is currently not impacting condition but has the potential to do so over the next reporting cycle, if activity levels increase or are unmanaged. It is important to identify these threats to be able to put preemptive management in place to prevent further declines in condition.

Activities that go through licencing and permission process e.g. offshore wind whereby the impact of the activity on the feature would be assessed have not been included. The threats to the Grassholm SPA for the gannets feature are stated below.

#### Disease

Further outbreaks of avian flu were identified as the biggest threat to gannet numbers on Grassholm. However, his threat cannot be managed at a site level due to free movement of wild birds.

#### Disturbance

Current disturbance levels are not affecting the condition of the gannet feature. However, the normally high levels of gannets on Grassholm means that any landing by the public would cause disturbance, therefore it is important that the current no landing policy is maintained and that the RSPB continue to work with local tour operators to minimise disturbance.

#### Invasive species

Any introduction of predatory mammals (particularly rats) to the island could have a devastating impact on the colony at Grassholm, particularly now when the numbers are severely reduced.

#### Climate change

It is not yet clear what pressures will be seen from climate change at the site level or how different pressures will counter act each other. However, threats from climate change that could impact the species may include:

- Increasing sea surface temperature.
- Changes to prey availability and abundance.

## 4. Evidence gaps

Although some of the performance indicators were assessed using proxy data reducing confidence in the individual target assessments, there were no major evidence gaps identified during the assessment.

However, annual or bi-annual monitoring of population levels and productivity would be very useful until bird numbers return to pre-2023 levels.

# 5. References

Hamer, K., Humphreys, E., Garthe, S., Hennicke, J., Peters, G., Grémillet, D., Phillips, R., Harris, M. and Wanless, S. 2007. <u>Annual variation in diets, feeding locations and foraging</u> <u>behaviour of gannets in the North Sea: flexibility, consistency and constraint</u>. Marine Ecology Progress Series 338:295

Morgan, G.D, Stephens, N. and Humpidge, R. 2023. A census of the Northern Gannet Population on Grassholm 2023. NRW evidence report, 744, 13pp, NRW, Bangor.

RSPB. 2023. HPAI Surveillance of RSPB Grassholm. Report to the Welsh Government Marine Protected Area grant. Unpublished report, pp. 27.

Votier, S.C., Fayet, A.L., Bearhop, S., Bodey, T.W., Clark, B.L., Grecian, J., Guilford, T., Hamer, K.C., Jeglinski, J.W., Morgan, G. and Wakefield, E. 2017. <u>Effects of age and</u> <u>reproductive status on individual foraging site fidelity in a long-lived marine predator</u>. Proceedings of the Royal Society B: Biological Sciences, 284(1859), p.20171068.

Wakefield, E.D., Bodey, T.W., Bearhop, S., Blackburn, J., Colhoun, K., Davies, R., Dwyer, R.G., Green, J.A., Grémillet, D., Jackson, A.L. and Jessopp, M.J. 2013. <u>Space partitioning</u> without territoriality in gannets. Science, 341(6141), pp.68-70. N502211PP.pdf

Vulcano, A. 2021. <u>Seabird of the month – Northern Gannet (*Morus bassanus*)</u>. Birdlife international